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28. ULUSAL
KİMYA KONGRESİ
ÖZET KİTABI
15-21 AĞUSTOS 2016

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EDITTED BY
Nevzat KÜLCÜ
Nermin ŞİMŞEK KUŞ
Göktürk AVŞAR

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ÖNSÖZ / *Preface*

Bilimsel araştırmaların meslektaşlar arasında tartışılması ve eleştirilere açılması bakımından seminer, çalıştay, sempozyum ve kongre gibi etkinliklerin yararı inkar edilemez. Bilimsel araştırma sonuçlarının makale olarak dergilerde yayımlanarak yaygın kullanıma açılması önemli olsa da, yeterli değildir. Ayrıca yeni bilimsel bilgilerin seminer, çalıştay, kongreler gibi ortamlarda, meslektaşlarla yüz yüze görüşerek onların eleştirilerine açılması da gerekir. Bu türlü bilimsel toplu etkinlikler, meslektaşların birbirleriyle tanışmaları yanında yeni işbirliklerinin kurulması, genç bilim insanlarının deneyimlileri örnek alması ve akademik geleneklerin içselleştirilmeleri bakımından da küçümsenemeyecek bir öneme sahiptir.

Her yıl yapılmakta olan Ulusal Kimya Kongreleri, yukarıda vurgulanan hususlarda şüphesiz ki büyük yararlar sağlamaktadır. Ancak, geçen zaman içinde araştırmacı sayısının haylice artmış olması, oturumların paralel oturumlar halinde yürütülmesini, sunum sürelerinin kısaltılmasını, katılımcıların oturumlar arasında yorucu koşuşturmalarını zorunlu hale getirmiş ve çokluk içinde iletişim imkanlarının azalmasına yol açmıştır. Belirtilen nedenlerle, artık kongreler daha dar uzmanlık alanları içinde düzenlenmeye başlamıştır. Bunun Ulusal Kimya Kongrelerine yansıması katılımcı sayısının düşmesine yol açsa da, bu kongrenin öneminde bir azalmaya yol açmamıştır.

Temel bilimcilerin görev sınırları, artık yalnızca laboratuvarlarda bilgi üretmekle sınırlı kalmayıp, üretilen bilgilerin uygulanması ve doğrudan ticari ürünlere dönüştürülmesi yönünde genişlemeye başlamıştır. Bunun tipik örnekleri, sağlık bilimleri, katalizörler, güneş pilleri, tekstil ürünleri gibi çok değişik alanlarda nanomalzeme geliştirilmesi ve üretimidir. BU trend her geçen gün daha da belirginleşmektedir. Şüphesiz ki bu gelişmeler temel bilimlerin işlevinde ciddi değişimlere yol açacağa benzemektedir. Davetli konuşmacıların tercihinde, bu eğilimler uygun çalışması olan ödüllü genç araştırmacılara öncelik verilerek onların cesaretlendirilmesi amaçlanmıştır. Alanlarında otorite Hocalarımızın bu konuda bizi anlayışla karşılayacaklarını ümit ediyoruz ve gelecekteki kongrelerin hazırlanmasında da bu yeni eğilimlerin dikkate alınmasının gerekliliğine inanıyoruz.

Ulusal Kimya Kongreleri'nin sahipliğini üstlenmiş bulunan Türkiye Kimya Derneği' de gelişmiş ülkelerin kimya derneklerine benzer bir yapılanmaya girerek, kendisini de yeniden yapılandırarak alt birimlerini oluşturmalı, gerçekleştirilen kongrelerinde bir veri bankasını kurmalıdır. Böylelikle üretilen bilgiler korunmuş ve kimya tarihimizle ilgili güzel bir kaynak yaratılmış olacaktır.

Kongrenin düzenlenmesinde emeği geçen yerel ve ulusal düzenleme kurulu ile bilim kurulu üyelerimize, yoğun çaba sarf ederek özenli bir şekilde bildirileri değerlendiren hakemler kuruluna; temel bilimlerin durumunu ve yenilikçilik bağlamında üniversite sanayi işbirliğinin ulusal ekonomi için yararlarını ele alan ve irdeleyen panelistlere; maddi ve manevi destek veren tüm kurum ve kuruluşlara ve nitelikli hizmetleri nedeniyle de Brosgroup Şirketine şükranlarımı sunuyorum.

Prof.Dr. Nevzat Külcü
Kongre Başkanı

KURULLAR / *The Boards*

Düzenleme Kurulu

Onursal Başkan

Ahmet Çamsarı, *Rektör*

Kongre Başkanı

Nevzat Külcü, *Mersin Üniversitesi*

Başkan Yardımcıları

Nermin Şimşek Kuş, *Mersin Üniversitesi*
Hakan Arslan , *Mersin Üniversites*i
Önder Metin, *Atatürk Üniversitesi*
Göktürk Avşar, *Mersin Üniversitesi*

Genel Sekreter

Bahattin Yalçın, *TKD Temsilcisi – Marmara Üniversitesi*

Ulusal Düzenleme Kurulu

Bahattin Yalçın, *TKD Temsilcisi – Marmara Üniversites*i
Ertuğrul Arpac, *Akdeniz Üniversitesi*
Nevzat Külcü, *Mersin Üniversitesi*
Sinem Göktürk, *TKD Temsilcisi – Marmara Üniversitesi*
Fatih Mehmet Emen, *Mersin Üniversitesi*
Önder Metin, *Atatürk Üniversitesi*

Yerel Düzenleme Kurulu

Nevzat Külcü, *Mersin Üniversitesi*
Hakan Arslan , *Mersin Üniversitesi*
Nermin Şimşek Kuş, *Mersin Üniversitesi*
Öztekin Algül, *Mersin Üniversitesi*
Meltem Düdükçü, *Mersin Üniversitesi*
Göktürk Avşar , *Mersin Üniversitesi*
Gün Binzet , *Mersin Üniversitesi*
İlkay Gümüş, *Mersin Üniversitesi*
Mine İnce Ocakoğlu, *Mersin Üniversitesi*
Pelin Eroğlu, *Mersin Üniversitesi*
Ayça Aktaş, *Mersin Üniversitesi*
Doğan Çirmi, *Mersin Üniversitesi*
Erdal Yabalak , *Mersin Üniversitesi*
Özgür Yılmaz, *Mersin Üniversitesi*
Özkan Görmez, *Mersin Üniversitesi*
Rukan Suna, *Mersin Üniversitesi*
Derya Kaynarpınar, *Mersin Üniversitesi*
Derya Kılıç, *Mersin Üniversitesi*
Dilek Güreş, *Mersin Üniversitesi*
Ebru Uvaçin, *Mersin Üniversitesi*
Ümmühan Solmaz, *Mersin Üniversitesi*
Zuhal Emire, *Mersin Üniversitesi*

KURULLAR / *The Boards*

Bilim Kurulu

Ahmet Gül*, İstanbul Teknik Üniversitesi*
Arif Daştan, *Atatürk Üniversitesi*
Atilla Cihaner, *Atılım Üniversitesi*
Bekir Çetinkaya, *TÜBA Üyesi*
Erdal Bedir, *Ege Üniversitesi*
Ertuğrul Arpac, *Akdeniz Üniversitesi*
Hakan Arslan, *Mersin Üniversitesi*
K. Arzum Erdem Gürsan, *Ege Üniversitesi*
Mehmet Doğan, *TÜBA Üyesi*
Mehmet Suat Somer, *Koç Üniversitesi*
Melek Merdivan, *Dokuz Eylül Üniversitesi*
Metin Balcı, *TÜBA Üyesi*
Mustafa Soylak, *Erciyes Üniversitesi*
Nazan Demir, *Muğla Sıtkı Koçman Üniversitesi*
Nermin Şimşek Kuş, *Mersin Üniversitesi*
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Oğuz Okay, *İstanbul Teknik Üniversitesi*
Özcan Erel, *Yıldırım Beyazit Üniversitesi*
Özer Bekaroğlu, *TÜBA Üyesi*
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Saim Özkar, *Ortadoğu Teknik Üniversitesi*
Selahattin Serin, *Çukurova Üniversitesi*
Vefa Ahsen, *Gebze Teknik Üniversitesi*
Veysel Turan Yılmaz, *Uludağ Üniversitesi*
Yusuf Baran, *Abdullah Gül Üniversitesi*
Zeynel Kılıç, *Ankara Üniversitesi*

BİLİMSEL PROGRAM

Scientific Program

Kısaltmalar / Short Codes:
GDK: Genel Davetli Konuşmacı / *Pleanary Lecturer*
DAK: Davetli Alan Konuşmacısı / *Invited Lecturer*
S: Sözlü Sunum / *Oral Presentation*
P: Poster Sunum / *Poster Presentation*

15 Ağustos / August 2016

08:00-09:00	Kayıtlar / *Registration (Uğur Oral Kültür Merkezi)*				
09:00-11:00	Açılış / *Opening Ceremony* Dinleti / *Small Concert* Açılış Konuşmaları / *Opening Speeches* *(Uğur Oral Kültür Merkezi-Salon-Hall A)*				
11:00-11:30	Çay-Kahve Arası / *Tea-Coffe Break*				
11:30-12:30	GDK-1 (Genel Davetli Konuşmacı / *Plenary Lecturer*) **Saim Özkar** **Tepkimeleri Düşük Sıcaklıkta Katalizleyen Geçiş Metal Nanokümeleri** *(Uğur Oral Kültür Merkezi-Salon A)*				
12:30-13:30	Yemek / *Lunch (Merkezi Kafeterya / Central Cafeteria)* & Sergi / *Exhibition (Uğur Oral Kültür Merkezi)*				
13:30-15:15	**Panel 1** *(Uğur Oral Kültür Merkezi-Salon A)* **Kimya Sektöründe Yenilikçilik ve Üniversite Sanayi İşbirliğinin Önemi** **Oturum Başkanı** / *Chair* **: Necmi Sadıkoğlu** **Panelistler** / *Panelists* **: Oğuzhan Gürlek, Orhan Bursalı, Şerafettin Aşut**				
15:15-15:35	Çay-Kahve Arası / *Tea-Coffe Break*				
	SALON / HALL A	**SALON / HALL B**	**SALON / HALL C**	**SALON / HALL D**	**SALON / HALL E**
Oturum Başkanı Session Chair	***Saim Özkar***	***Vefa Ahsen***	***Önder Metin***	***Mehmet Doğan***	***Erdal Bedir***
15:35-15:50	S-A1-001 Synthesis of fused thiophene based organic porous material for food safety Erdal Ertaş, İlknur Demirtaş, Turan Öztürk	S-B1-001 Effect of dimensionality and the polymorphism on the properties of ZnO Ilker Demiroglu, Stefan Bromley	S-C1-001 A New Bıomaterial Based Pd(II) Catalyst For Green Synthesis of Biarlys In Suzukı Coupling Reactions Talat Baran	S-D1-001 Simple, rapid and cost-effective preconcentration of acrylamide from chips, crackers and cereal-based baby foods prior to its spectrophotometric detection Nail Altunay, Ramazan Gürkan	S-E1-001 Facile Synthesis Of Unprecedented Heteronuclear Phthalocyanine Ring And Its Evaluation In Photodynamic Therapy Dilek Elmalı, Ayşegül Varol, Ayşe Tansu Koparal, Mehmet Varol, Bekir Salih, Özer Bekaroğlu
15:50-16:05	S-A1-002 Construction of Novel Pyrrolocarbazoles via Hemetsberger Reaction Hakan Kandemir, İbrahim Fazıl Şengül	S-B1-003 Self-Assembled Glyco-Nanoparticles for Drug Delivery Platform Aydan Dag, Martina Heide Stenzel	S-C1-002 Syntheses of Chiral Ionic Liquid Based Ru(II)-Phosphinite Complexes and Investigation of Their Catalytic Activityin Asymmetric Transfer Hydrogenation of Ketones Nermin Meriç	S-D1-002 A Simple Dispersive Liquid–Liquid Microextraction Method for Determination of Bismuth by FAAS Teslima Daşbaşı, Şenol Kartal, Şerife Saçmacı, Ahmet Ülgen	S-E1-002 Anti-Hemolytic Effect of three Salvia Species Emre Koç, Ferda Candan

16:05-16:20	S-A1-003 Michael Addition of 2-Aminoethanethiol Hydrochloride to Chalcones with Triethylamine -Catalyzed Osman Nuri Aslan, Meliha Burcu Gürdere, Mustafa Ceylan, Yakup Budak, Ali Cemal Emeç	S-B1-004 Double Surface Modification Of Various Carbon Nanotubes Pınar Sinem Omurtag, Hakan Durmaz, Gürkan Hızal, Ümit Tunca	S-C1-003 Heteroleptic mü-Nitrido Diiron Phthalocyanines as Oxidation Catalysts Ümit İşci	S-D1-003 Preparation and Certification of Natural Gas Mixtures Erinç Engin, Tanıl Tarhan	S-E1-003 Antimicrobial And Antioxidant Activities of the Essential oil And Various Extracts of Thymbra Spicata and Ocimum Basilicum (Lamiaceae) Güler İnci Tanrıkulu, Ceren Yavuz, İbrahim Hüdai Taşdemir
16:20-16:35	S-A1-004 Preparation of novel heterocycles based on indoles Ibrahim Fazil Sengul, Hakan Kandemir	S-B1-007 Preparation and Characterization of Protein-Inorganic Hybrid Nanoflowers and Availability of Dye Decolorization Cevahir Altınkaynak, Sureyya Tavlasoglu, Ismail Ocsoy, Nalan Özdemir	S-C1-004 Chiral Monodentate and Bidentate Ferrrocenyl Based Metal-Phosphinite Complexes and Their Catalytic Activity In Transfer Hydrogenation Reaction Murat Aydemir	S-D1-004 Validation of IDMS Method for the Determination of Elements in Soil by Sector Field ICPMS Oktay Cankur, Süleyman Z. Can	S-E1-004 Bioactivity-guided Isolation of Luteolin-7-O-Glucoside from Tanacetum Abrotanifolium (L.) Druce (Asteraceae) İbrahim Halil Geçibesler
16:35-16:55	Çay-Kahve Arası / *Tea-Coffe Break*				
	SALON / HALL A	**SALON / HALL B**	**SALON / HALL C**	**SALON / HALL D**	**SALON / HALL E**
Oturum Başkanı Session Chair	***Vefa Ahsen***	***Tamer Uyar***	***Hasan Küçükbay***	***Mustafa Soylak***	***Nazan Demir***
16:55-17:10	S-A1-006 Comprehensive Synthesis of Monohydroxy–Cucurbit[n]urils (n = 5,6, 7, 8): High Purity and High Conversions Mehmet Menaf Ayhan, Hakim Karoui, Micaël Hardy, Antal Rockenbauer, Laurence Charles, Roselyne Roses, Konstantin Udachin, Paul Tordo, David Bardelang, Olivier Ouari	S-B3-012 Tuning Work Functions Of Transparent Conducting Electrodes By 2 eV Using Conjugated Phosphonic Acids Unsal Koldemir, Jennifer L. Braid, Amanda Morgenstern, Mark Eberhardt,	S-C1-005 N-Butyl Substituted N-Heterocyclic Carbene-Pd(II)-pyridine (PEPPSI) Complexes: Synthesis, Characterization and Catalytic Activity in the Suzuki-Miyaura Reaction Rukiye Fırıncı	S-D1-005 Method Development for VOC Analysis with TD-GC-MS: A Comparison of Columns and Adsorbent Tubes Kevser Topal, Mine Bilsel, Gökhan Bilsel, İlker Ün	S-E1-006 Synthesis of Metalloporphyrin based Photosensitizers Used in Photodynamic Therapy and Cancer Treatment Ali Tuna

17:10-17:25	S-A1-007 Tumor Site Activatable Disulfide-Bridged Tetrapyrroles for Selective Photodynamic Therapy Serkan Alpugan, Fabienne Dumoulin		S-C1-006 Catalytic Investigation of Ionic Liquids and Their Silver Complexes Zeynep Taşcı	S-D1-006 Preconcentration of Tetracycline Residues From Some Kind of Food Matrices Using Ionic Liquid Based Ultrasonic Assisted Aqueous Two Phase Extraction Mine Antep, Taşkın Mumcu, Serap Seyhan Bozkurt, Melek Merdivan	S-E4-001 Synthesis, Optimization and Evalution on Phototoxic Index of 3- and 4-pyridyl metalloporphyrins Ali Tuna
17:25-17:40			S-C2-001 Gold-Catalyzed and NaH-Supported Cyclization Reactions of N-Propargyl Pyrrolo and Indole Derivatives Sinan Basceken, Serdal Kaya, Metin Balci	S-D1-007 Determination of Nicotine, Propylene Glycol and Glycerin in e-liquids by Using Chromatographic Methods Zinar Pınar Gümüş, Caner Geyik, Görkem Yararbaş, Suna Timur	S-E3-001 Alteration of bovine liver catalase activity by lambda cyhalothrin and fenthion insecticides Hasan Karadağ, Filiz Kaplan
17:40-18:40	**Poster Sunumları-1 /** ***Poster Presentation*** *(Merkezi Kafeterya/ Central Cafeteria)*				
19:25-22:00	**Açılış Resepsiyonu /** ***Opening Reception*** *(Pedias)*				

16 Ağustos / August 2016

08:00-09:00	Kayıtlar / *Registration (Uğur Oral Kültür Merkezi)*				
09:00-10:00	GDK-2 (Genel Davetli Konuşmacı / *Plenary Lecturer*) *(Uğur Oral Kültür Merkezi-Salon-Hall A)* **Yusuf Baran** **Kanserin Moleküler Biyolojisi/ Kanserde İlaç Dirençliliği**				
	SALON / HALL A	**SALON / HALL B**	**SALON / HALL C**	**SALON / HALL D**	**SALON / HALL E**
Oturum Başkanı Session Chair	***Süleyman Patır***	***Fabienne Duomoline***	***Şule Ertan Ela***	***Filiz Kuralay***	***Oğuz Okay***
10:00-10:15	**S-A1-008** Synthesis Some New 1,2,4-Triazoles, Their Mannich Bases And Evaluation Of Their Antimicrobial Activities Şule Ceylan	**S-B1-009** Calculation of the single oscillator and clausius–mossotti model parameters of the 2-hydroxybenzothiazole (2-OHBT) with solution technique Bayram Gündüz	**S-C2-002** N-Heterocyclic Carbene (NHC) Catalyzed Arylation of Aldehydes Serpil Denizaltı	**S-D1-008** Synthesis of a Novel Adsorbent ‘’Nano Ni/Fe Supported On Nutshell’ And The Adsorptıon of As(III) and As(V) Tülin DENİZ ÇİFTÇİ	**S-E1-008** Synthesis, Characterization and DNA Binding Studies of Novel ZnIIPc Basak Yüce Dursun, Özkan Danış, Soner Çubuk, Gamze Çakırca, Serap Demir, Ali Sadi Başak
10:15-10:30	**S-A1-009** Synthesis of electron-rich shape-persistent macrocycle - palvashaline: a possible candidate in molecular electronics, chemosensing, nanotubes and ion channels Said Nadeem, Muhammad Raza Shah, Mehmet Ali Özler	**S-B1-010** Production And Characterization Of Magnetic Nanoparticle Loaded Poly(Ɛ-Caprolactone) Nanofibers By Electrospinning Method Dilek Güreş, Didem Demir, Tuğba Tecim, Rükan Genç, Nimet Bölgen Karagülle	**S-B5-001** Some New Applications in Solid State Chemistry of Chemical Hardness and Molar Volume Concepts Savaş Kaya	**S-D1-009** Synthesis, identification, thermal analysis, computational, and antibacterial studies of z-n’-(5-bromothiophen-2-yl)methylene) nicotinohydrazide Ahmad Atiya Abu Obaid, Hussam Yahya, Ashraf Sawafta, Dyala Abu Aladel, Ahmad I. Asadi, Rami Shariah, Tasneem Alayed, Ismail Warad	**S-E1-009** Evaluation of Mucoadhesion by a Texture Analyzer for Different Polymers and Mucosal Tissues Fatmanur Tuğcu Demiröz, Serdar Tort, Sibel İlbasmış Tamer, Füsun Acartürk
10:30-10:45	**S-A1-010** New Hydrophobic Macromonomers With Alkyl Bromide End-Group Efkan Çatıker	**S-B1-011** Crystalline Nano-TiO2 Synthesized at Relatively Low Temperatures in Diverse Media Ömer Kesmez, Esin Akarsu, Murat Akarsu, Ertuğrul Arpaç	**SS367** **S-C2-003** Synthesis of polydentate carbene precursors and properties Öznur Doğan Ulu, İsmail Özdemir	**S-D2-001** The Effect of Sizing Compound on The Electropolymerization of Pyrrole and The Impedance of Microfiber Coated With Poly(pyrrole) Hacer Dolas, Diğdem Giray, A. Sezai Sarac	**S-E1-010** Investigation of antioxidant properties of some hydroxyanthraquinones: A Density Functional Theory Study Dilara Özbakır Işın

10:45-11:00	**S-A1-011** Synthesis, Spectroscopic Properties and DFT Calculations of Some Novel Mono Azo Dyes Derived From 5-Nitroanthranilic Acid Çiğdem Karabacak Atay, Merve Gökalp, Hasan Hüseyin Kart, Tahir Tilki	**S-B1-002** A DFT Study of Free and Supported Au-Rh Nanoalloys Ilker Demiroglu, Roy Luigi Johnston	**S-C2-004** Synthesis of Some Functionalized New Benzimidazolium Salts And Investigation of Their Microwave Asisted Catalytic Activities In The Presence of Pd(OAc)2/ Base and Copper in Sonogashira Coupling Reaction Hasan Küçükbay, Kemal Yavuz	**S-D2-002** Voltammetric behavior of acebutolol on a pencil graphite electrode: highly sensitive determination in pharmaceuticals and human urine by square-wave voltammetry Abdulkadir Levent	**S-E1-011** Halogen atom effect on amphiphilic porphyrins designed for pdt Derya Topkaya Taskıran, Fabienne Dumoulin
11:00-11:30	Çay-Kahve Arası / *Tea-Coffe Break*				
11:30-12:30	GDK-3 (Genel Davetli Konuşmacı / *Plenary Lecturer*) *(Uğur Oral Kültür Merkezi-Salon-Hall A)* **Ertuğrul Arpac** **Biyomalzeme Geliştirme Çalışmaları**				
12:30-13:30	Yemek / *Lunch* (*Merkezi Kafeterya / Central Cafeteria*) & Sergi / *Exhibition* (*Uğur Oral Kültür Merkezi*)				
	SALON / HALL A	**SALON / HALL B**	**SALON / HALL C**	**SALON / HALL D**	**SALON / HALL E**
Oturum Başkanı Session Chair	***Nigün Kalaycıoğlu Özpozan***	***Tamer Uyar***	***Selmiye Alkan Gürsel***	***Ramazan Altundaş***	***Yusuf Baran***
13:30-14:15	**DAK-1** **Süleyman Patır** İndol Alkaloidlerinin Sentezinde Yeni Yaklaşımlar – Ulein Alkaloidlerinin Sentezi	**DAK-2** **Atilla Cihaner** Fonksiyonel Konjuge Polimerlerin Sentezi ve Uygulama Alanları	**DAK-3** **Selmiye Alkan Gürsel** Graphene Supported Pt Nanoparticles as Electrocatalysts for PEM Fuel Cells	**DAK-4** **Mustafa Soylak** Kimyasal Analizde Yeni Gelişmeler: Mikroekstraksiyon Teknikleri ve Yeni Nesil Çözücüler	**DAK-5** **Erdal Bedir** Tanımlanamamış Bir Bitki Kökünden Katma Değeri Yüksek Fitokimyasallara ve İlaç adayı Bileşiklere
14:15-14:30	**S-A1-012** The Synthesis and Theoretical Calculations of N-(1,3-Benzothiazole-2-yl)-N-(1,4,5,6-tetrahydropyrimidine-2-il)amin's Derivatives Dilem Gündüz, Murat Genc	**S-B1-013** Preparation of Novel PCL-CD Polymeric Nanoparticles Ahmet Aykac	**S-C2-005** Research of the esterification reaction of anhydrides of alkenylsuccinic acids in the presence of various catalysts Muharrem Ali Mammadyarov, Fatmakhanim Kheybar Aliyeva, Nijat Zakeria İsayev, Fidan Akif Mammadova	**S-D2-003** Effect of ascorbic acid on the corrosion behavior of copper in a neutral medium Sema Çelik, Güray Kılınççeker	**S-E1-012** Inhibition of human monoamine oxidase by c3- and c4-substituted phthalonitriles Özkan Danış, Haytham Elzien Alamin Ali, Başak Yüce Dursun, Selçuk Altun, Zafer Odabaş

14:30-14:45	**S-A1-013** The Synthesis, Characterization, DFT and Docking Calculations of Imidazolidine-2-thione Derivatives Özlem Keskin, Murat Genc	**S-B2-001** Functional Hydrogels Using Dendron-Polymer Conjugates as Building Blocks Sadık Kağa, Rana Sanyal, Amitav Sanyal	**S-C2-006** Selective gas phase oxidation of monochlorotoluenes over modified oxovanadium systems supported on Al2O3 and SiO2 Arif Efendi, Elmir Babayev, Fexriyye Nasiri, Bilqeyis İsmayilova, Firuze Yunisova	**S-D2-004** The determination of fruit concentrated of inhibition effect of lycium barbarum of the electrochemical behavior of the copper in chloride medium Sema Çelik, Mustafa Kemal Sangün, Güray Kılınççeker	**S-E1-013** Micellar Drug Delivery Systems Rana Sanyal
14:45-15:00	**S-A1-014** Synthesis of new imidazole-based heterocyclic molecules and evaluation of their applications Nurettin Mengeş	**S-B2-002** Synthesis of functional water soluble polymers and patterned hydrogels via thiol-ene crosslinking Nergiz Cengiz, Amitav Sanyal	**S-C2-007** Stereodivergent Asymmetric Catalysis with a Mechanically Point-Chiral Rotaxane Yusuf Çakmak, Sündüs Erbaş Çakmak, David A. Leigh	**S-D2-005** Synthesis of gold nanoparticles on gc electrode surface modified with diazonium method Ömer Faruk Ünal, Duygu Ekinci, Züleyha Kudaş	**S-E1-014** Effects of acyl homoserine lactone analogs desiged as Quroun Sensing inhibitors on the production of Pseudomonas Aeruginosa virulence factors Rejna Ağbal, Gülgün Boşgelmez Tınaz, Yasemin Dündar
15:00-15:15	**S-A1-015** Synthesis of Some Brominated Diarylmethanone Derivatives Yasin Çetinkaya	**S-B3-001** Preperation Of Light Collector Organic Molecules - Single Wall Carbonnanotube Hybrid Ahmet Şenocak, Erhan Demirbaş, Mahmut Durmuş	**S-C2-008** Enantioselective hydrolyses of racemic ibuprofen methyl esters by immobilized lipase Reşit Çakmak, Ercan Çınar, Giray Topal, Selami Ercan	**S-D2-006** Anticorrosive Properties of Poly(Pyrrole-co-2-chloroaniline) on Alloy Plated Electrode Abdurrahman Akdağ, Ali Tuncay Özyılmaz	**S-E1-016** Synthesis of 2-Amino-3-[(2-Nitro-1-Henylpropyl) Thio]Pro Panoic Acid Derivatives And Structure Elucidation Semra Utku, Erdoğan Berçin
15:15-15:35	Çay-Kahve Arası / *Tea-Coffe Break*				
15:35-16.35	**Panel 2** *(Uğur Oral Kültür Merkezi-Salon-Hall A)* **Sponsor ve Destekleyen Şirket ve Kuruluşların Tanıtımı** **Oturum Başkanı** / *Chair* **: Göktürk Avşar** **Panelistler** / *Panelists* **:** **Ümit Sarı**-*AKİB Genel Sekreter Yardımcısı* **Sefa Özincegedik**-*Şişecam* **Emin Yıldız** -*Toros Tarım Mersin Üretim Tesisleri-Genel Müdür Yardımcısı* **Onur Terkeşli** - *Dow Güney Ofisi Lideri* **Altan Gürsel**-*SciFinder*				
16:35-16:55	Çay-Kahve Arası / *Tea-Coffe Break*				

	SALON / HALL A	**SALON / HALL B**	**SALON / HALL C**	**SALON / HALL D**	**SALON / HALL E**
Oturum Başkanı Session Chair	***Hakan Usta***		***Ahmet Gül***	***Ayşegül Gürek***	***Öztekin Algül***
16:55-17:10	**S-A1-016** Design, synthesis and characterization of novel nitroaromatic compounds having biological activities Ercan Çinar, Reşit Çakmak, Selami Ercan, Hatice Güneş Çakmak		**S-C3-001** Catalyst Effect of Chitosan on Biodiesel Production Zafer Ömer Özdemir, Halil Mutlubaş	**S-D2-007** MiSens device as a new automated biosensing platform based on Real-time Electrochemical Profiling (REP) Yıldız Uludağ	**S-E1-017** Synthesis and biological evaluation of some fluoro-substituted chalcones Öztekin Algül, Serdar Burmaoğlu, Derya Aktas Anıl, Arzu Gobek, Gulay Gulbol Duran, Ronak Haj Ersan, Nizami Duran
17:10-17:25	**S-A1-017** Synthesis, characterization and antiglycation of new family of heterocyclic Schiff Bases Mohammed Abdullah Alnuri, Ismail Kh Warad		**S-C4-001** Transfer Hydrogenation of Aromatic Nitro, Nitrile, and Carbonyl Compounds Catalyzed by Reduced Graphene Oxide Supported Cobalt-Palladium Alloy Nanoparticles Hasan Can, Kıvılcım Şendil, Mehmet Serdar Gültekin, Önder Metin	**S-D3-002** An Amperometric Xanthine Biosensor Based on 7,7,8,8-Tetra-cyanoquinodimethane/ Multiwalled Carbon Nanotubes/ Metal Oxide Nanoparticles Composite: Fe3O4 versus Co3O4 Berna Dalkıran, Pınar Esra Erden, Esma Kılıç	**S-E1-018** Chemical constituents and antiproliferative activities of Santolina chamaecyparissus Muhammed Altun
17:25-17:40	**S-A1-018** Syhthesis of New beta-Lactam Derivatives byUsing Imines and Schiff Bases Kıvılcım Şendil, Burhanettin Turan, M. Emin Şengül, M. Serdar Gültekin		**S-C4-002** Asymmetric Catalysis with a Mechanically Point-Chiral Rotaxane Sündüs Erbaş Çakmak, Yusuf Çakmak, David A. Leigh	**S-D3-003** Amperometric L-lysine Biosensor Based on Graphene/c-MWCNT/SnO2 Composite Modified Glassy Carbon Electrode Ceren Kaçar, Pınar Esra Erden, Esma Kılıç	
17:40-18:40	**Poster Sunumları-2 / *Poster Presentation*** *(Merkezi Kafeterya/ Central Cafeteria)*				
19:25-22:00	**Yemek / *Dinner*** *(Merkezi Kafeterya/ Central Cafeteria)*				

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08:00-09:00	Kayıtlar / *Registration (Uğur Oral Kültür Merkezi)*				
09:00-10:00	GDK-4 (Genel Davetli Konuşmacı / *Plenary Lecturer*) *(Uğur Oral Kültür Merkezi-Salon-Hall A)* **Oğuz Okay** **Yeni Nesil Biyouyumlu Jeller ve Polimer İskeletleri** **(New Generation Biocompatible Gels and Polymer Scaffolds**				
	SALON / HALL A	**SALON / HALL B**	**SALON / HALL C**	**SALON / HALL D**	**SALON / HALL E**
Oturum Başkanı Session Chair	***Metin Balcı***	***Sermin Örnektekin***	***Mehmet Kadir Yurdakoç***	***Tayyar Güngör***	***Agah Seza Baştuğ***
10:00-10:15	**S-A2-001** Syntheses and Spectroscopic Characterizations on New Dithiophosphonato Complexes of Ni(II), Cd(II), Hg(II) and Ni-Pyridine Complexes Ertuğrul Gazi Sağlam, Ahmet Ebinç	**S-B3-002** Synthesis, Characterization And Potential Applications of α,β-Unsaturated Nitriles Abdullah Toraman, Feray Aydoğan, Çiğdem Yörür Göreci, Mehmet Kazici	**S-C5-001** Use of The Analog Series A Quaternary Ammonium Salt For Surface Modification of Montmorillonite Özkan Açişli, Semra Karaca, Ahmet Gürses	**S-D3-001** Potentiometric carbonate determination in drug tablets containing MgCO3 or CaCO3 as active ingredient Cihan TOPCU	**S-E1-019** Structure-Activity Relationship of Some 4-Aminoantipyrine Compounds: Evaluation of the Substituent Effect on Cytotoxic and Apoptotic Activities Baki Türkkan, Zafer Uyar, Ismail Koyuncu
10:15-10:30	**S-A2-002** Syntesis of nano and micro particles PbIn2Se4-one of high respective solor cell components Aliye Bayram Rzayeva	**S-B3-003** 4-(Hydroxymethyl)-1,3-Dioxolane-2-On And Polyethylene Glycol Containing Borate Ester Polymer Electrolytes Aysel Demirci, Esra Eren, Yunus Emre Özkara, Betül Karataş, Yunus Karataş	**S-C5-002** Surface characterization of biochars produced by hydrothermal carbonization and application for anionic and cationic dye adsorption Ezgi Çağlar, Yusuf Osman Donar, İbrahim Biroğul, Ali Sınağ, Kıvanç Aydıncak	**S-D3-004** A New Capacitive Gas Chromatogrphy Detector Based on Dielectric Measurement Talat Özpozan, Taki Eddine Haroun, Ahmet Ülgen	**S-E1-020** In Vitro Cytotoxicity Perspective Of Tamiflu Ahmet İlhan, Umut Kökbaş, Kezban Kartlaşmış, Levent Kayrın
10:30-10:45	**S-A2-003** Synthesis of Coumarin Sunstituted Crown Ether Compounds and Investigation of Fluoroionophore Behaviours Duygu Şahin, Zeliha Hayvalı	**S-B3-004** The Use Of Tris(2-(2-Methoxy)Ethyl) Borate As Solvent And Electrolyte Additive In Lithium-Ion Batteries Sümeyye Köybaşı, Yunus Emre Özkara, Betül Karataş, Yunus Karataş	**S-C4-003** Preparation of TiO2/Perlite Composites by Using 23-1 Fractional Factorial Design Dilek Duranoğlu	**S-D3-005** Synthesis, Characterization, And Chemosensing Application Of Poly(Methyl Methacrylate-Co-Hydroxyethyl Methacrylate) With Dansyl Side Group Erdinç Doğancı, Mesut Görür	**S-E2-002** Investigation of Convallaria Majalis's Flowers Desing of Perfume Usage With Other Flowers Usage Nazan Demir, Yaşar Demir, Sıla Nezahat Daşdemir

10:45-11:00	**S-A2-004** Bodipy Decorated Dendrimeric Cyclotriphosphazene Photosensitizers: Synthesis And Efficient Singlet Oxygen Elif Şenkuytu, Esra Tanrıverdi Eçik, Zeynep Cebesoy, Gönül Yenilmez Çiftçi	**S-B3-005** The Use Of Some Phosphate Derivatives As Solvent In Lithium-Ion Batteries Burak Gündüz, Abdullah Ünsal, Sümeyye Köybaşı, Betül Karataş, Yunus Karataş	**S-B5-002** Crystal Structure and Computational Study of C13H10N2O3 Zeliha Atioğlu, Mehmet Akkurt, Aliasghar Jarrahpour, Edris Ebrahimi, Orhan Büyükgüngör	**S-D3-006** For The Determination Blood Glucose Levels To Design A Second Generation Biosensor Based On Glucose Oxidase Enzyme Kezban Kartlaşmış, Umut Kökbaş, Mustafa Muhlis Aplarslan, Başak Sanna, Levent Kayrın	**S-E1-005** Synthetic Carbon Nanotube Membranes to Predict Skin Permeability of Compounds Sibel Ilbasmis Tamer, Fatmanur Tugcu Demiroz, Ismail Tuncer Degim
11:00-11:30	Çay-Kahve Arası / *Tea-Coffe Break*				
	SALON / HALL A	**SALON / HALL B**	**SALON / HALL C**	**SALON / HALL D**	**SALON / HALL E**
Oturum Başkanı Session Chair	***Metin Balcı***	***Sermin Örnektekin***	***Mehmet Kadir Yurdakoç***	***Tayyar Güngör***	***Agah Seza Baştuğ***
11:30-11:45	**S-A2-005** Coordination Chemistry of Antimony(III) Complexes with Ligands Containing Sulfur Donor Atoms Ibrahim Ismet Ozturk, Sotiris K. Hadjikakou	**S-B3-006** The Use Of Allyl Bis(2-Methoxyethyl) Phosphate As Additive In Lithium-Ion Batteries Mevlüt Bilir, Abdullah Ünsal, Burak Gündüz, Sümeyye Köybaşı, Betül Karataş, Yunus Karataş	**S-B4-015** Hydroxyethyl Methacrylate Based Nanocomposite Hydrogels with Tunable Pore Architecture Erhan Bat	**S-D3-007** Detection of α-thalassemia 3.7 Kb. deletion mutation using piezoelectric biosensor immobilized with a single oligonucleotide Umut Kökbaş, Kezban Kartlaşmış, Başak Sanna, Mustafa Muhlis Alparslan, Ümit Yaşar, Ebru Dündar Yenilmez, Abdullah Tuli, Levent Kayrın	**S-E3-002** Advantages of aqueous two phase partitioning (ATPP) for biomolecules and partitioning of catalase by ATPP Yonca Avcı Duman, Arda Acemi, Yonca Yüzügüllü
11:45-12:00	**S-A2-006** The Reactions, Spectroscopic and Stereogenic Properties of NO Donor Type Mono-ferrocenyl-cyclotetraphosphazenes with Monodentate Ligands Gamze Elmas, Aytuğ Okumuş, Zeynel Kılıç	**S-B3-007** Co-Pyrolysis Of Göynük Oil Shale With Polypropylene And Structural Characterization Of Pyrolysis Liquid Pınar Acar Bozkurt, Nagehan Merve Kutlu, Muammer Canel	**S-B4-016** Understanding the Sulfur-Centred Radicals Behaviour During Self-Healing Mechanism Isa Degirmenci, Michelle L. Coote	**S-D4-001** Using Natural Stone Pumice In Van Region On Adsorption Of Some Textile Dyes Veysel Benek, Ali Rıza Kul, Ahmet Selçuk, Nilgün Onursal	**S-E3-003** Thermal-Unfolding Studies of Geobacillus kaustophilus Lipase by Circular Dichroism Spectroscopy Şeyda Çiğdem Özkan, Ali Türkan

12:00-12:15	**S-A2-007** The heavy atom effect on the singlet oxygen generation of axially bodipy substituted silicon(IV) phthalocyanine Baybars Köksoy, Esra Nur Kaya, Serkan Yeşilot, Mahmut Durmuş	**S-B1-015** Influence of Al Concentration on The Electrical and Optical Properties of ZnO Thin Films Ebru Güngör, Tayyar Güngör	**S-B4-017** A nano-scaled nucleating additive for improving thermal insulation properties of rigid polyurethane foams Bilge Erdem	**S-D4-002** Biosorption of methylene blue from an aqueous solution by iron oxide-coated Cystoseira barbata Yeliz Ozudogru, Melek Merdivan, Tolga Göksan	**S-E3-004** Fluorescence Study on the Interaction of Bovine Serum Albumin with Floretin in Phosphate-Buffered Seda Karabulut, Mahmut Toprak
12:15-12:30	**S-A2-008** The Reactions of 4-Fluorobenzylspiro(N/O)cylotriphosphazene with Mono and Bidentate Ligands: Structural Characterizations and Stereogenic Properties Aytuğ Okumuş, Gamze Elmas, Zeynel Kılıç	**S-B3-009** Design of A Novel Conducting Composite Supported By Pt Nanoparticles For Hydrogen Production From Water Didem Balun Kayan, Merve İlhan, Derya Koçak	**S-B4-018** The effect of molding temperature on thermal insulation and mechanical properties of rigid polyurethane foams Murat Erdem	**S-D4-003** Electrochemical Decolorization of Reactive Violet 5 Textile Dye using Pt/Ir Electrodes Kezban Meltem Turan, Bahadır K. Körbahti	**S-E3-005** (MS-Guided Genome Mining For the Discovery of New Marine Natural Products) Suleyman Ozakin, Paul Jensen, Ebru Ince
12:30-13:30	Yemek / *Lunch* *(Merkezi Kafeterya / Central Cafeteria)* & Sergi / *Exhibition (Uğur Oral Kültür Merkezi)*				
	SALON / HALL A	**SALON / HALL B**	**SALON / HALL C**	**SALON / HALL D**	**SALON / HALL E**
Oturum Başkanı Session Chair	***Selahattin Serin***	***Meltem Düdükçü***	***Ferhan Tümer***	***Nermin Şimşek Kuş***	***Amitav Sanyal***
13:30-14:15	**DAK-6** **Hakan Usta** Design and Development of Functional Organic Small Molecules and Polymers for High Performance Optoelectronics	**DAK-7** **Vural Bütün** 'Lego-Gibi' Polimerler: Nano-Örgütlü, Yetenekli, Çevre Duyarlı, Akıllı ve Hatta Şizofrenler	**DAK-8** **Önder Metin** Nanocatalysts in a Wıde-Range Applıcatıon Spectrum: From Organıc Synthesıs To Energy Storage	**DAK-9** **Ümit Demir** Electrochemical Synthesis And Electrochemical Applications of Reduced Graphene Oxide-Metal/Metal Oxide Nanocomposites	**DAK-10** **Amitav Sanyal** Small Solutions for Big Problems: Polymeric Nanomaterials in Life Sciences
14:15-14:30	**S-A2-009** Synthesis and Characterization of Metallo Phthalocyanines with 2-pyridineethanol Substituents Nesuhi Akdemir	**S-B1-014** Synthesis and Encapsulation Ability Properties of Gold-Glyco Nanoparticles Ahmet Aykac, Manuel Cristo Martos Maldonado, Antonio Vargas Berenguel	**S-B5-003** Coating of Retro-Reflective Glass Beads with Montmorillonite Alican Vatansever, Hacer Doğan, Tülay İnan	**S-D4-004** Evaluation of Energy Consumption in Electrochemical Oxidation of Acid Violet 7 Textile Dye using Pt/Ir Electrodes Kezban Meltem Turan, Bahadır K. Körbahti	**S-E3-006** X-Ray Diffraction and SEM Study of Urinary Stones in Mersin Mustafa Serkan Yalçın, Mesut Tek

14:30-14:45	**S-A2-010** Original "Push-Pull" Phthalocyanines of AABB and A3B-BA3 Type Gülçin Ekineker, Fabienne Dumoulin, Vefa Ahsen	**S-B3-010** MPt (M: Co, Ni, Cu) Alloy Nanoparticles Assembled On Reduced Graphene Oxide As Cathode Catalysts For Nonaqueous Lithium- Oxygen Batteries Melike Sevim, Carlotta Francia, Julia Amici, Önder Metin	**S-B5-004** Development of Composite Polyurethane Foam Using Environmentally Friendly Materials Anil Umut Ozdemir, *Hazal Gergeroglu*, Huseyin Avci	**S-D2-008** Investigation Of Surface Hardness Of The Electrolytic Hard Chromium Coated Steels Depending On Process Parameters Şengül Danışman, Emre Yildirim, Levent Ercan	**S-E3-007** Determination of Effects of Nonylphenol on Oxidative Stress in Primarily Hepatocyte Culture in Lake Van Fish Aslı Çilingir Yeltekin, Ahmet Regaib Oğuz
14:45-15:00	**S-A2-012** Phthalocyanine - Resorcinarene Cavitand Hybrids: Design, Synthesis and Host-Guest Interactions With Fullerene Derivatives Zeynel Şahin, Vefa Ahsen, Süleyman Gökhan Çolak, Mine İnce, Fabienne Dumoulin, Ümit İşci	**S-B3-011** Production and Characterizations of Nd2O3 Doping fcc-ZrO2 Electrolyte Type Solid Oxide Fuel Cells Sevgi Ata, Orhan Turkoglu	**S-C2-009** Ligand controlled nickel catalyzed allyl coupling of mixed arylzinc reagents Melike Kalkan		**S-E3-008** A Simple and Sensitive UHPLC Method for the Determination of Ochratoxin-A and Its Application to Biological Samples Elif Mine Öncü Kaya, Orhan Tansel Korkmaz, Ogün Akdere, Duygu Yeniceli Uğur, Neşe Tunçel, Muzaffer Tunçel
15:00-15:15	**S-A2-013** Tetraethylene glycol-substituted Zn phthalocyanine system for naked-eye observations of acidic medium Emel Önal, Sevinc Z. Topal, Mohamed Tarhouni, Ümit Isci, Jamoussi Bassem, Vefa Ahsen, Fabienne Dumoulin	**S-B1-008** Fabrication of Non-Enzymatic Glucose Sensor Based on Nanocomposite of Nanocellulose-AuNPs Nurcan Erkoca, Hakan Çiftçi, Onur Ulker	**S-B5-005** Analysis of Rubber Mixtures to Investigate EGR (Exhaust Gas Recirculation)-Blow By Strength and Development of Novel Rubber Compounds Ürküş Topaloğlu, Gül Ünal		**S-E3-009** The investigation of the amounts of vitamin A, vitamin E, βeta-carotene and Lycopene in some red fruits and dark red Ebru Çöteli, Fikret Karataş
15:15-15:35	Çay-Kahve Arası / *Tea-Coffe Break*				
15:35-16:35	**Panel 3** *(Uğur Oral Kültür Merkezi-Salon A)* **Kimya Eğitiminin Lisans ve Lisansüstü Düzeyde Sorunları ile Bilim ve Teknoloji Politikaları** **Oturum Başkanı** / *Chair* **: Nevzat Külcü** **Panelistler** / *Panelists* **:** **Mehmet Doğan, Sermin Örnektekin, Metin Balcı**				

16:35-16:55	Çay-Kahve Arası / *Tea-Coffe Break*				
	SALON / HALL A	**SALON / HALL B**	**SALON / HALL C**	**SALON / HALL D**	**SALON / HALL E**
Oturum Başkanı Session Chair	***Hakan Aslan***	***A.Murat Gizir***	***Nigün Kalaycıoğlu Özpozan***		***Fatih Mehmet Emen***
16:55-17:10	**S-A2-014** Coordination modes of thiosemicarbazones based on substitue salicylaldehyde and triphenylphosphine Şükriye Güveli	**S-B3-013** Malgama Method Using Sodium Borohydride (NaBH4) Production Zehra Gülten Altın, Esra Ruken Demirdöğen, Fatih Mehmet Emen	**TÜBİTAK Teşvikleri (Ahmet Gül)**		**S-E3-010** Determination of the Trace Element Levels in Hair of Smokers and Non-Smokers by ICP-MS Elif Varhan Oral
17:10-17:25	**S-A5-009** The Characterization and Biosynthesis of Silver Nanoparticles Using Dağdağan Fruit Extract (Celtis Tournefortii L.) Çetin Doğar, Havva Akbulut, Ahmet Gürses, Leyla Akgün	**S-B3-014** Thermochemical Conversion Behavior of Different Biomass Feedstocks: Gasification and Pyrolysis Işıl Işık Gülsaç, Yeliz Durak Çetin, Berrin Engin, Parvana Gafarova Aksoy, Hakan Karataş, Alper Sarıoğlan			**S-E4-002** DNA Adsorption via Co(II) Immobilized Cryogels Kadir Erol
17:25-17:40		**S-B3-015** Surface Modification of CdSeS Nanocrystals for Hybrid Solar Cell Applications Şerafettin Demiç, Ayşenur Erdoğan, Caner Karakaya, Mehmet Kerem Gönce, Sümeyra Büyükçelebi, E. Yenel, Koray Kara, Ahmet Nuri Özcivan, Mustafa Can, Mahmut Kuş			**S-B5-006** Investigation of Impurities in the Ulexite Dissolution Process via Taguchi Method Vedat Arda Küçük, Barış Şimşek, Mehmet Muhtar Kocakerim
17:40-18:40	**Poster Sunumları-3 / *Poster Presentation*** *(Merkezi Kafeterya/ Central Cafeteria)*				
19:25-22:00	**Yemek / *Dinner*** *(Merkezi Kafeterya/ Central Cafeteria)*				

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08:00-09:00	Kayıtlar / *Registration* (Uğur Oral Kültür Merkezi)				
09:00-10:00	GDK-5 (Genel Davetli Konuşmacı / *Plenary Lecturer*) *(Uğur Oral Kültür Merkezi-Salon-Hall A)* **Metin Balcı** **Organogold Chemistry: Application to the Synthesis of Various Heterocycles with New Skeletons**				
	SALON / HALL A	**SALON / HALL B**	**SALON / HALL C**	**SALON / HALL D**	**SALON / HALL E**
Oturum Başkanı Session Chair	***Hasan Küçükbay***	***Fabienne Dumouline***	***Agah Seza Baştuğ***	***Mehmet Doğan***	***Öztekin Algül***
10:00-10:15	**S-A2-015** Syntheses and Structural Characterizations of Fırst Paraben Substituted Ferrocenil Phosphazene Compounds Yasemin Tümer, Efsun Şehirli, Çiğdem Yüksektepe Ataol	**S-B3-016** Enhanced Capacity Retention of Li2CO3 Coated LiMn2O4 Cathode Material For Lithium Batteries Halil Şahan, Hüseyin Göktepe, Şaban Patat	**DAK-11** **Şule Erten Ela** Alternatıve Materıals For Catalyzes Used in Dye Sensıtızed Solar Cells	**DAK-12** **Filiz Kuralay** Elektrokimyasal Nanobiyosensörler ve Uygulamaları	**S-E3-011** Sensitive Time Resolved Flouroimmunoassay for Hemoglobin A1c with Eu Label Derya Koyuncu Zeybek, Müzeyyen Özge Karaşallı, Alper Tolga Çolak, Semanur Şen
10:15-10:30	**S-A2-016** N2O2 Chelate Complexes of OxovanadIum(IV): Comparıson and Structural Investigation Berat İlhan Ceylan	**S-B3-017** Hydrothermal synthesis of LiFePO4 composite cathode material for Li-ion Battery Hüseyin Göktepe, Halil Şahan, Şaban Patat			**S-E3-012** Can Boron be actor in diabetes mellilitus and obesity? Ruken Esra Demirdöğen, Derya Kılıç, Fatih Mehmet Emen
10:30-10:45	**S-A5-003** Applications of Poly(lactic acid) and Blends in Membrane and Packaging Fields Reyhan Özdoğan, Tolga Yirmibeşoğlu, Mithat Çelebi	**S-B4-001** Polyglycolic acid and copolymers from cationic polymerization of C1 feedstocks Ersen Göktürk, Stephen Albert Miller			**S-E4-004** The synthesize of benzofuranone and indole derivatives which are important in pharmacy by using biotechnological methods Zerrin Zerenler Çalışkan

10:45-11:00	**S-A5-004** Physical Properties of Benzethonium Chloride Based Deep Eutectic Solvents Mehmet Bengi Taysun, Emine Sert, Ferhan Sami Atalay	**S-B4-002** Ion-Exchange properties of ionites with various functional groups Mahnur Jafarli Moysun, Aliaddin Abbasov Dayyan	**S-B4-019** A New Platform to Obtain a Soluble Poly(3,4-ethylenedioxythiophene) Salih Ertan, Atilla Cihaner	**S-D2-009** Acetylcholinesterase-Choline Oxidase Biosensor Based on Multi-Walled Carbon Nanotubes- Iron Oxide Nanoparticles-Chitosan Nanocomposite Gözde Aydoğdu Tığ, Ecem Özlem Bolat, Şule Pekyardımcı	**S-E1-007** Determination of Quantitative Structure-Activity Relationships of DABO Derivatives by Electron Conformational-Genetic Algorithm Method Lalehan Akyüz, Emin Sarıpınar
11:00-11:30	Çay-Kahve Arası / *Tea-Coffe Break*				
	SALON / HALL A	**SALON / HALL B**	**SALON / HALL C**	**SALON / HALL D**	**SALON / HALL E**
Oturum Başkanı Session Chair	***Cihangir Tanyeli***	***Ferhan Tümer***	***Sibel Zor***	***Mehmet Mahramanlıoğlu***	***Fatih Mehmet Emen***
11:30-11:45	**S-A5-005** Physical Properties of Choline Chloride – Citric Acid Based Deep Eutectic Solvent and Its Catalytic Employment in the Esterification Reactions Mehmet Bengi Taysun, Emine Sert, Ferhan Sami Atalay	**S-B4-003** Effect Of Bulky Groups And π - π Interaction On The Tacticity Relationships Of Bulky Methacrylates Isa Degirmenci, Michelle L. Coote	**S-B5-007** Creating Of A Skin Mimicking Material For Medical Implant Applications Operating In The Mics And Ism Bands, And An Exemplary Antenna Return-Loss Measurement For Testing Purpose Erdinç Doğancı, Mustafa Hikmet Bilgehan Ucar, Erdem Uras	**Mehmet Ali Kağıtçı Anısına** Agah Seza Baştuğ	**DAK-13** **Nazan Demir** Kozmetik Sektöründe Üniversite Sanayi İşbirliği ve Marka Oluşturma
11:45-12:00	**S-A5-006** Green Chemistry Applications In Energy Production Zafer Ömer Özdemir	**S-B4-004** Synthesis of poly (methyl methacrylate-b-N-isopropylacrylamide) thermo responsive block copolymer by redox and atom transfer radical polymerization Melahat Göktaş	**S-B5-008** Preparation And Characterization of Montmorillonite/ Polycaprolactone Composite Scaffold Containing Strontium For Bone Tissue Engineering Studies Aysel Koç Demir		

12:00-12:15	**S-A5-007** Investigation of Efficiency of “I Protect The Environment with Green Chemistry” Entitled Tubitak-4004 Nature And Science Schools Project Mehmet Çabuk, Feyza Uçar Çabuk, Hülya Gülay Ogelman, Halil Ibrahim Ünal	**S-B4-005** Electrorheological properties of biodegredable chitosan / expanded perlite composites” Mehmet Çabuk, Mustafa Yavuz, Halil Ibrahim Unal	**S-B5-009** Analysis of the Effects of Different Additives on Base Oils Pelin Ay Büyüknisan, Zehra Gülten Altın, Fatma Karaca Albayrak		
12:15-12:30	**S-A5-008** The Characterization And Green Synthesis Of Gold Nanoparticles Using Karahindiba Plant (Taraxacum Officinale)Extract Çetin Doğar, Leyla Akgün, Ahmet Gürses, Havva Akbulut	**S-B4-006** Synthesis And Characterization of Cellulose Based Aerogel Compsite Bio-Polymer Material Isolated from Waste of Blueberry Tree (Vaccinium Myrtillus) Mehmet Kaya, Ömer Sungur, Kadir Sevimli, Zehra Özçifçi, Ahmet Tabak	**S-B5-010** Films containing upconversion phosphors which can be used against pathogenic microorganisms Fatih Mehmet Emen, Ruken Esra Demirdogen, Derya Kilic		**S-E3-013** Investigation of Mineral Levels of Endemic Nepeta Viscida Yasemin Sunucu Karafakıoğlu, Laçine Tür Aksoy, Zeyneb Aslan
12:30-13:30	Yemek / *Lunch (Merkezi Kafeterya / Central Cafeteria)* & Sergi / *Exhibition (Uğur Oral Kültür Merkezi)*				
	SALON / HALL A	**SALON / HALL B**	**SALON / HALL C**	**SALON / HALL D**	**SALON / HALL E**
Oturum Başkanı Session Chair	***Ayşegül Gürek***	***Fatih Mehmet Emen***	***Önder Metin***		
13:30-13:45	**DAK-14** **Fabienne Dumoulin** Design & Synthetic Strategies of Photosensitising Tetrapyrrolic Derivatives	**DAK-15** **Tamer Uyar** Elektro-Eğirme Yöntemi ile Fonksiyonel Nanoliflerin Üretilmesi ve Uygulama Alanları	**S-B4-012** Preparation of Egg White/ Polyaniline Gel Electrodes by Using Gamma-Rays Uğur Adnan Sevil, Enes Kocabaş, Okan Orbay Harputlu Harputlu, Merve Özçalıcı, Aaytül Dumlu	**Uygulamalı Kozmetik Çalıştayı** **Düzenleyen** Göktürk Avşar **Uygulayıcılar:** Levent Kahrıman ve Aylin Kahrıman	

13:45-14:00	**S-A1-019** Catalytic Dehydrogenation Of Secondary Alcohol To Ketone In Liquid Phase Anıl Dinçer, Dilek Duranoğlu	**S-B4-008** Synthesis and Characterization of Novel Methacrylate Monomer, Homopolymer and Copolymer Containing Methoxy Group Hülya Elmalı Gülbaş, Nevin Çankaya	**S-B4-013** Fish Skin Isolated Collagen Cryogels for Tissue Engineering Applications: Purification, Synthesis and Characterization Zeynep Çetinkaya, Didem Demir, Nimet Bölgen Karagülle		
14:00-14:15	**S-A2-017** Ionic liquids with aluminate and borate based weakly coordinating anions Şafak Bulut	**S-B4-010** Immobilization of Schiff base metal complexes on poly (pyrrole-co-o-anisidine)/chitosan composite films and its electrocatalytic activity Süleyman Yalçınakaya	**S-B4-014** Solution And Vapor- Phase Polymerization of Aniline Uğur Adnan Sevil		
14:15-14:30		**S-B4-011** Thermal, Mechanical And Antibacterial Properties of LDPE/Starch Bio-Based Polymer Blends for Food Packing Applications Hale Berber Yamak	**S-E5-001** Determination of Cocaine and Benzoylecgonine in Biological Matrix by HPLC and LC-MS/MS Zinar Pınar Gümüş, Veysel Umut Çelenk, Emine Güler, Bilal Demir, Hakan Çoskunol, Suna Timur		
14:30-14:50	Çay-Kahve Arası / *Tea-Coffe Break*				
14:50-16:30	**Panel 4** *(Uğur Oral Kültür Merkezi-Salon A)* **Kongrenin Değerlendirilmesi** **Panelistler:** **Nevzat Külcü** **Mehmet Mahramanlıoğlu** **Cihangir Tanyeli**				
19:25-22:00	**Kapanış Yemeği** / *Closing Dinner* (Pedias)				

POSTER PROGRAMI

Poster Program

Poster Sunumları - 1 | 15.08.2016 | 17:40 - 18:40 | Merkezi Kafeterya
Poster Presentations - 1 — *Central Cafeteria*

P-001	The kinetic effect of carbon dioxide corrosion by imidazoline derivatives based on synthetic oxy- and petroleum acids Lale Afandiyeva, Vagif Abbasov, Leyla Aliyeva, Latif Nuriyev, Shahla Aliyeva
P-002	Synthesis And Characterization Of Some Schiff Base Derivatives Dilek Elmalı, Volkan Cırık, Halil Berber
P-003	Synthesis and characterization of a new quinazolin-4-carboxylic acid derivative Derviş Gök
P-004	Some new quinazolin-4-carboxylic acid ester derivatives synthesis and characterization Derviş Gök
P-005	Synthesis and Characterization of Alpha and Beta Substituted Zinc and Metal-Free Phthalocyanines Bearing 3,4,5-Trimethoxyphenoxy Groups Cansu Bilen, Zafer Odabaş, Ahmet Çetin
P-006	Chiral Liquid Crystals With Reversed Ester Linking Group Gürkan Karanlık, Aykun Özkonstanyan, Emre Kırgın, Hale Ocak, Belkıs Bilgin Eran
P-007	Synthesis of Phosphorous Containing Polycyclooctene Derived By ROMP Ilay Ceren Acar, Tarık Esen
P-008	Synthesis and antioxidant properties of some 3-alkyl(aryl)-4-(3-benzoxy-4-methoxybenzylidenamino)-4,5-dihydro-1H-1,2,4-triazol-5-ones Şule Bahçeci, Nuri Yıldırım, Özlem Gürsoy Kol, Haydar Yüksek
P-011	Synthesis of new protic 1-(arylsubstituted)-3,5-dimethylpyrazolium salts Melek Canbulat Özdemir, Beytiye Özgün
P-012	Novel BODİPY Derivatives Bearing Different Iodine Atoms: Synthesis,Chemical and Physical Properties Baybars Köksoy, Esra Nur Kaya, Serkan Yeşilot, Mahmut Durmuş
P-013	Synthesis of Metal Complexes of Some Formazans Obtaining From Cinnamaldehyde and Investigation of Their Dyeing Properties Using Different Methods Fatma Nuralın, Nursabah Sarikavakli
P-014	Synthesis of guanidine based oxothiazolidine derivatives and quantum-chemical calculations Nuriye Doğan, Halis Karataş, Sevtap Çağlar Yavuz, Emin Sarıpınar
P-015	Synthesis and Characterization of New meso-β Directly Linked Porphyrin-Corrole Hybrid Dyad Hilal Kalkan, Barış Temelli
P-016	An Investigation on One Pot Multi Component Ugi Reaction with Furfuryl Amine and Followed By IMDAF Cycloaddition Aydın Demircan, Melike Mutlu
P-018	Inhibition Of Peroxidase Activity By Symmetric and Unsymmetric Substituent Novel Burcu Somtürk Yılmaz, Senem Akkoç, Burçin Türkmenoğlu, Nalan Özdemir, İlhan Özer İlhan
P-019	One Pot Environmentally Benign Cascade Reactions Of Furans; Protection And IMDA Cycloaddition Emrah Aydoğan, Aydın Demircan
P-020	Synthesis of Thienothiophene and Dithiophene Triphenyl Amine Couples for Organic Conductive Materials Onur Şahin, Turan Öztürk
P-021	Imine based chiral rod-like liquid crystals Pınar Çağlar Eyol, Hale Ocak, Gürkan Karanlık, Belkıs Bilgin Eran
P-022	Synthesis, Characterization and Antioxidant Activities of Novel 1-(Morpholine-4-yl-methyl)-3-alkyl(aryl)-4-[4-(dimethylamino)-benzylidenamino]-4,5-dihydro-1H-1,2,4-triazol-5-ones Özlem Gürsoy Kol, Haydar Yüksek, Sevda Manap, Feyzi S. Tokalı
P-023	Synthesis of complex esters of vicinal dicarboxylic acids Muharrem Ali Mammadyarov, Fatmakhanim Kheybar Aliyeva, Asef Muharrem Babazadeh, Fidan Akif Mammadova

Poster Sunumları - 1 | 15.08.2016 | 17:40 - 18:40 | Merkezi Kafeterya
Poster Presentations - 1 *Central Cafeteria*

P-024	Synthesis Of Novel Fluoroquinolone-Triazole Hybrid Compounds As Antimicrobial Agents Serap Başoğlu Özdemir
P-025	Synthesıs And Characterızatıon Of Some Azole Derıvatıves Yıldız Uygun, Serap B. Ozdemir, Sule Ceylan, Arif Mermer, Hacer Bayrak, Neslihan Demirbas, Ahmet Demirbas
P-026	Synthesis and Antimicrobial Activities of New 1,2,4- triazoles, Mannich Bases, Conazoles and Fluoroquinolones Şule Ceylan
P-027	Synthesıs Of Some Fluoro-Substıtuted Flavonoıd Derıvatıves As Antı-Cancer Agents Serdar Burmaoğlu, Yasemin Kaygusuz, Meryem Yar, Derya Aktaş Anıl, Arzu Göbek, Ramazan Altundaş
P-028	Phosphorus-Nitrogen Compounds. The reactions of hexachlorocyclophosphazatriene with 1,6-hexane-diol. Nuclear magnetic studies of the products Yakup Coşkun, Sedat Türe
P-029	The Synthesis Of Different Azulene Derivatives Berna Gür, M. Emin Şengül
P-030	Theoretical and Spectroscopic Studies of 1-(Morpholine-4-yl-methyl)-3-benzyl-4-(4-isopropylbenzylidenamino)-4,5-dihydro-1H-1,2,4-triazol-5-one Molecule Gül Kotan, Haydar Yüksek
P-031	Synthesis of molecular tweezers and its naked-eye chemosensing against Fe3+ Said Nadeem, Muhammad Raza Shah, Burhan Khan, Mehmet Ali Özler
P-032	o-Carborane Containing Polysulfones by Click Chemistry Cemil Dizman, Tarık Eren
P-034	Effect of Concentration on Synthesis and Characterization of ZnO Nanostructures by Hydrothermal Method Sevim Demirözü Şenol, Melike Imamoğlu, Burcu Kartav, Kardelen Yıldırım
P-035	Preparation and Size Control of Bovine Serum Albumin Nanoparticles by Shockwise Aggregation Arif Sercan Sahutoglu, Cahit Akgul
P-037	Detection Of Toxic Mercury Ions In The Aqueous Solution Of Fluorescent Carbon Nanoparticles Burcu Baç, Melis Özge Alaş, Rükan Genç
P-038	Evaluatıon Of Dıfferent Polymers As Surface Passıvatıon Agents And Investıgatıon Of Theır Effect On The Fluorescence And Surface Propertıes Of Carbon Nanopartıcles Melis Özge Alaş, Rükan Genç
P-039	Phthalocyanine-based Periodic Mesoporous Organosilica nanoparticles: Expectations and Preliminary Results Vefa Ahsen, Fabienne Dumoulin, Jean Olivier Durand
P-040	Preparation and characterization of poly(N-vinyl pyrrolidone) composite hydrogels containing hydrophilic nano SiO2 Özge Fatma Gökmen, Nursel Pekel Bayramgil
P-041	Preperation of 3D Coumarin–Single Walled Carbon Nanotube Hybrid Materials via "Click" Chemistry Ahmet Şenocak, Baybars Köksoy, Erhan Demirbaş, Mahmut Durmuş
P-042	Electrospun nanofibers from fluorescent dansyl-functional (poly(styrene-(2-hydroxyethyl methacrylate))2-poly(ethylene glycol) copolymer Okan Günaydın, Hilal Kuday, Mesut Görür
P-046	Preparation and characterization of hydroxypropyl methyl cellulose-graphene nanocomposite films Esra Kılıç, Nursel Pekel Bayramgil
P-047	Zincphthalocyanine As Potential Fluorescence/Nuclear İmaging Agent For Cancer Cell* Abdulcelil YÜZER, Fatma Aslıhan Sari, Mine İnce, Mine İnce, Göktürk Avşar, Hale Melis Soylu, Özge Er, Fatma Yurt Lambrecht

Poster Sunumları - 1 | 15.08.2016 | 17:40 - 18:40 | Merkezi Kafeterya

Poster Presentations - 1 | *Central Cafeteria*

P-048	Synthesis of Copper Nanoparticles Using a Different Method: Determination of Its Antioxidant and Antimicrobial Activity Demet Demirci Gültekin, Azize Alayli Gungor, Hicran Onem, Aynur Babagil, Hayrunnisa Nadaroglu
P-050	Synthesis of keratin-based biocomposite Ömer Akkanat
P-051	Investigation of Optical Properties of Substituted Fe(II)Pc Sönmez Arslan, Emrah Atacı, Ahmet Tombak, Yusuf Selim Ocak
P-052	Substituted Iron (II) Phthalocyanine Sonmez Arslan, Emrah Ataci, Selami Sasmaz
P-053	Synthese and characterisation of Ca3WO6:Dy3+ phosphor and investigation of its luminescence properties Nevzat Külcü, Ramazan Altınkaya, Fatih Mehmet Emen
P-054	"Novel Acrylonitrile Derivatives Having Photovoltaic Performance" Çiğdem Yörür Göreci, Mehmet Kazici
P-055	Synthesıs, Characterızatıon And Theır Applıcatıons of Asymmetrıc Vınyl Derıvatıves Zülal Demir, Zuhal Turgut, Çiğdem Yörür Göreci, Mehmet Kazıcı
P-056	Glycerol Carbonate And Polyethylene Glycol Containing Borate Ester Polymer Electrolyte Membranes Esra Eren, Aysel Demirci, Sümeyye Köybaşı, Yunus Emre Özkara, Betül Karataş, Yunus Karataş
P-057	Pervaporation Separation of Biobutanol Using Ionic Liquid Based Polymeric Membranes Derya Erdoğan, Ayça Hasanoğlu
P-058	Novel Graphene Oxide-Carbon Fiber Hybrid Electrocatalysts for Fuel Cell Applications Emre Biçer, Begüm Yarar, César Merino, Selmiye Alkan Gürsel
P-059	High Temperature Sythesis And Photoluminescence Properties Of Dy1.90In0.10Zr2O7 Pyrochlore Type Phosphor Esra Öztürk, Erkul Karacaoğlu
P-060	Electropolymerization of Transition Metal Complexes of Schiff Bases on Platinum Electrode and Investigations of Their Electrocatalytic Activity Emel Bayol
P-061	ZnO Nanoparticulate Thin Film: Using Citrus Reticulata Peel Extract Hakan Çolak, Hüseyin Göktepe
P-062	Hydrolysis of (chloromethyl)ethylene carbonate to produce epichlorohydrin in the presence of ionic liquide as catalyst Emine Aytar
P-063	Synthesis and Characterization of Ferrocenyl Based Bis(Phosphinite) Ligands and Application of Their Ru(II)-Benzene Complexes in Asymmetric Catalysis Nermin Meriç, Yaser W. Abdlhmed Al Bayati, Feyyaz Durap, Akın Baysal, Murat Aydemir
P-064	Chiral Imine Based Ru(Ii)-Bis(Phosphinite) Complexes and Investigation of Their Catalytic Activity Murat Aydemir, Najmuldain A. Saleh, Murat Sünkür, Duygu Elma Karakaş, Nermin Meriç, Cezmi Kayan, Feyyaz Durap, Akın Baysal
P-065	One-pot Synthesis of Metal Oxide Nanoparticles-Graphitic Carbon Nitride Nanocomposites as Efficient Catalysts for the Dehydrogenation of Ammonia Borane Buse Sündü, Melike Sevim, Önder Metin
P-066	Synthesis of versatile fluorescent calix[4arenes and their application in the lipase-catalyzed enantioselective reactions Sevilay Çetingüney, Mehmet Oğuz, Elif Özyılmaz, Mustafa Yılmaz
P-067	a novel photon detector systems produced by carbon nanotubes Mohammad Ayaz Ahmad, Nursabah Sarikavakli, Nazia Tarranum

Poster Sunumları - 1 | 15.08.2016 | 17:40 - 18:40 | Merkezi Kafeterya
Poster Presentations - 1 | *Central Cafeteria*

P-069	Activity of catalytic system, containing benzimidazolium salt, palladium acetate, base and copper nanoparticles for 2-phenylbenzofuran synhthesis under microwave heating conditions Kemal Yavuz, Hasan Küçükbay
P-071	A Novel Electrochemical Sensor Based On Carbon Nanofibers and Metal Nanoparticles For The Quantification Of Ethyl-Paraben in Personal Care Products and Pharmaceuticals Ayşegül Kutluay Baytak, Tuğçe Teker, Şehriban Düzmen, Mehmet Aslanoğlu
P-072	The Removal of Cd and Cu From Aqueous Solution Using Sorbents Walnut Shell Immobilized On Co-Metharcrylic Acid-Styrene Ibrahim Teğin, Selma Akdeniz, Haci Baykara, Osman Tektaş
P-073	Optimization of Arbutin Extraction from Cranberry Leaves İbrahim Bulduk, Süleyman Gökce
P-074	Determination of Decomposition Compound of Noscapine (Alkaloid Derivative and Drug Ingredient) by LC-MS / MS Technique Süleyman Gökce, İbrahim Bulduk
P-075	Study of the interaction between ARA-C and Human Serum Albumin by spectroscopic approach Sibel Korunur, Ali Yılmaz
P-076	Al (III), Cu (II), Co (II), Pb (II), Mn (II), and Fe (III) Determinations in Various Samples by FAAS after Solid Phase Extraction Şule Dinç Zor, Güzin Alpdoğan
P-077	Physicochemical Parameters Characterization Of The Triazole Derivative Compounds Using Computational Methods Vildan Enisoğlu Atalay, Ayşenur Bekiroğlu, İlknur Arvas
P-078	A New Rapid Liquid Chromatography Mass Spectrometry Method for Separation of Aprepitant and Tamoxifen Gizem Kunal, Filiz Arıöz Özdemir
P-079	Voltammetric Behavior of Nimesulide in the Absence and Presence of Hydrogen Peroxide Emine Coşkun, Habibe Ebru Özerk
P-080	Inhibition Effect Of "Robinia Pseudoacacia" Leaf Extract On Corrosion Of Mild Steel In Acidic Medium Sedef Kaplan, Gülşen Avcı, Meltem Düdükcü
P-082	Determination of uric acid using Al2O3 nanoparticles modified carbon paste electrode Rüveyda Barsbuğa, Funda Öztürk, Pınar Esra Erden, Esma Kılıç
P-083	Theoretical Calculation of Electronic Properties of Diphenylphosphino aminobutyl Silver(I) Complex Fatma Mıdık Ertosun, Gülfeza Kardaş, Osman Serindağ
P-085	Simultaneous Determination of Ascorbic acid, Norepinephrine and Uric acid by Differential Pulse Voltammetry on a Disposable Pencil Graphite Electrode in the Pharmaceutical Formulations and Human Urine Samples Abdulkadir Levent, Günay Önal
P-086	Some methanesulfonates-based acetylcholinesterase inhibitors Kani Zilbeyaz, Murat Guney, Murat Senturk
P-087	UV/VIS Investigation of Methanol Solvation Behavior Of Some Pyrimidines Containing Keto And Thioketo Groups Meral Tekin, Hasan Kılıç, Bahattin Yalçın
P-090	Modulatory effects of Elaeagnus umbellate thunb. Autumn olive leaf and fruit aqueous extracts in vivo marker antioxidant enzymes Tevfik Özen, Mehmet Toka, Kemal Yıldırım
P-091	Impact of Elaeagnus umbellate thunb. Autumn olive leaf and fruit crude aqueous extracts on mice hepatic marker drug metabolizing enzymes Tevfik Özen, Kemal Yıldırım, Mehmet Toka

Poster Sunumları - 1 | 15.08.2016 | 17:40 - 18:40 | Merkezi Kafeterya
Poster Presentations - 1 *Central Cafeteria*

P-093	Comparison of Tamoxifen Entrapment Capacities and Release Profiles of Alginate, Aginate/chitosan, Magnetic Alginate and Magnetic Alginate/chitosan Beads Çağdaş Sunna, Onur Korkmaz, Arife Alev Karagözler
P-094	Productıon and Drug Release Assesment of Melatonin Loaded Alginate/Gum Arabic Beads Bernis Girgin, Onur Korkmaz, Rukiye Yavaşer, Arife Alev Karagözler
P-095	Production And Investigation Of Controlled Drug Release Properties Of Tamoxifen Loaded Alginate/Gum Arabic Microbeads Onur Korkmaz, Bernis Girgin, Çağdaş Sunna, Arife Alev Karagözler
P-097	Synthesis, structural explanation on carrying some new bis benzimidazol, benzoxazole and benzothiazole derivatives Ronak Haj Ersan, Ahmet Yuksel, Öztekin Algül
P-098	Investigation of antituberculosis activity of some 2-substitued benzimidazol derivatives with agar proportion method Büşra Gül Ertürk, Öztekin Algül, Mahmut Ülger, Seda Tezcan Ülger
P-099	Six coordination compounds: mode of cytotoxic action and biological evaluation Ali Aydın, Şengül Aslan Korkmaz
P-100	Synthesis and In-Vitro Biological Activities of Some New 1-(Morpholine-4-yl-methyl)-3-alkyl(aryl)-4-(4-ethoxybenzylidenamino)-4,5-dihydro-1H-1,2,4-triazol-5-ones Gül Kotan, Muzaffer Alkan, Özlem Gürsoy Kol, Haydar Yüksek
P-101	A New Antidiabetic Drug's Raw Material: Ferula Elaeochytris Kezban Kartlaşmış, Umut Kökbaş, Nadire Eser, Cemil Göçmen, Levent Kayrın

Poster Sunumları - 2 | 16.08.2016 | 17:40 - 18:40 | Merkezi Kafeterya
Poster Presentations - 2 | *Central Cafeteria*

P-103	Synthesis, Characterization and Electrochemical Properties of New Metal Free, Cobalt(II), Copper(II) and Manganese(III) Phthalocyanines Ayşe Aktaş Kamiloğlu, İrfan Acar, Zekeriya Bıyıklıoğlu
P-104	Synthesis of Tetra Peripheral Substituted New Phthalocyanine Derivatives and Their Electrochemical Properties Ayşe Aktaş Kamiloğlu, İrfan Acar, Zekeriya Bıyıklıoğlu
P-105	Synthesis, Characterization and Electrochemical Properties of New Co(II), Cu(II) and Fe(II) Phthalocyanines Gülbınar Sarkı, Halise Yalazan, Zekeriya Bıyıklıoğlu, Hasan Altunparmak, Halit Kantekin
P-107	Synthesis and properties of cyclotriphosphazene-bodipy conjugates Seda Çetindere, Süreyya Oğuz Tümay, Mahmut Durmuş, Adem Kılıç, Serkan Yeşilot
P-108	Synthesis and Characterization of Substituted Thiophen-2-Carboxaldehyde TSC Ligands and Their Ni(II)/Co(II) Complexes Hatice Kübra Kalhan, Volkan Demir, Elif Subaşı
P-110	new palladium (II) complexes of a series of thiosemicarbazones Volkan Demir, Hatice Kübra Kalhan, Elif Subaşı
P-112	Novel Symmetric and Asymmetric Azido-Ga(III) Phthalocyanines Ayşe Gül Gürek, Veysel Koç, Duygu Aydın Tekdaş, Sevinç Zehra Topal, Fabienne Dumoulin, Vefa Ahsen
P-113	Synthesis and Structural Characterization of Novel Bismuth(III) Bromide Complexes with Thioamides Ibrahim Ismet Ozturk, Mehmet Cakmak, Anastasios J. Tasiopoulos, Sotiris K. Hadjikakou
P-114	Synthesis and Structural Characterization of New Antimony(III) Chloride Complex With N,N-Diethylthiourea Sinem Yarar, Ibrahim Ismet Oztürk, Anastasios Tasiopoulos, Sotiris Hadjikakou
P-115	novel copper (I/II) complexes containing substituted thiophen-2-carboxaldehyde tsc ligands and their biological activities Elif Çetin, Levent Sönmez, Elif Subaşı
P-116	The synthesis and characterization of dioxomolybdenum(VI) complexes of 3, 5-di-tert-butyl-salicylaldehyde-S-butyl thiosemicarbazone Baki Türkkan
P-117	Synthesis and Characterization of 3-Chloro-N-(Dialkylcarbamothioyl)Benzamide And Their Nickel And Copper Complexes Gün Binzet, İlkay Gumus, Ummuhan Solmaz, Birdal Arslan, Ebru Uvacin, Emrah Aslantatar, Ulrich Flörke, Nevzat Külcü, Hakan Arslan
P-118	Synthesis, characterization and antimicrorobial activity of benzamide derivatives and their palladium and platinum complexes Ebru Uvaçin, Ümmühan Solmaz, Ali Nail Selçik, Süleyman Bozkurt, İlkay Gümüş, Emrah Aslantatar, Gün Binzet, Aylin Döğen, Birdal Arslan, Hakan Arslan
P-119	Coordination Compound of 2-Mercapto-1-Methylimidazole With Bismuth(III): Synthesis and Srtuctural Characterrization Sinem Yarar, Ibrahim Ismet Öztürk, Anastasios Tasiopoulos, Sotiris Hadjikakou
P-120	Synthesis Of Aerogels With Different Starting Materials Ali Keskin, Taner Kavas, Koray Bülbül, Doğan Soyal, Tuğba Dalgıçer, Murat Dereli
P-121	Synthesis And Characterization of Nickel Octaamido Phthalocyanine Ercan Duygulu, Fatma Yüksel
P-122	Meso-tetraphenylporphyrin-based Nanofibers: Oxygen Sensor Property and Silver Nanoparticles İnfluence Emel Önal, Zeynep Ay, Zubeyde Yel, Kadriye Ertekin, Ayse Gul Gurek, Sevinc Zehra Topal, Catherine Hirel
P-123	Specificities of Phase Equilibrium in the In2Te3CuCr2S4 System Mehriban Şirin Hsnova

Poster Sunumları - 2 | 16.08.2016 | 17:40 - 18:40 | Merkezi Kafeterya

Poster Presentations - 2 | *Central Cafeteria*

P-124	Zn(II)-Coordination Polymer Constructed From 3,3’,5,5’-Azobenzenetetracarboxylic Acid And 1,4-BIS(2-Isopropylımıdazol-1-Ylmethyl)Benzene Mürsel Arıcı, Okan Zafer Yeşilel
P-125	Preperation of Cathode Materials Based on Polyphosphazene and Investigation of Potential Usage in Rechargeable Li-ion Batteries Sedat Küçükköylü
P-126	Synthesis of Bodipy containing cyclotriphosphazene and measure of the singlet oxygen generation Zeynep Cebesoy, Esra Tanrıverdi Eçik, Elif Şenkuytu, Gönül Yenilmez Çiftçi, Adem Kılıç
P-127	Synthesis and Characterization of N-((6-Methylpyridin-2-YL)Carbamothioyl)Thiophene-2-Carboxamide and its Co(II), Ni(II) And Cu(II) Complexes: Calculating of Molecular Orbitals, Antioxidant and Antitumor Activities Tuncay Yeşilkaynak
P-128	Synthesis and Characterization of N-((2-Chloropyridin-3-YL)Carbamothioyl)Thiophene-2-Carboxamide and its Co(II), Ni(II) And Cu(II) Complexes: Calculating of Molecular Orbitals, Antioxidant and Antitumor Activities and Electrochemical Behavior Tuncay Yeşilkaynak, Harun Muslu, Celal Özpınar, Fatih Mehmet Emen
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P-281	G3 Pamam Dendrimer-miRNA Polyplex Formation: Computational And Experimental Approach Ali Öztuna, Hasan Nazır, Celal Tuğrul Zeyrek, Hüseyin Ünver
P-282	Synthesis of Amino Acid Linked Cryogels And Biological Applications Büşra Sarıca, Kazım Köse, Kadir Erol
P-283	SAFFRON Crocus sativus L. and ITS ACTIVE CONSTITUENT: SAFRANAL Mürüvvet Düz, A. Fatih Fidan
P-284	4D-QSAR Studying With MCET Method On Trypsin-Like Serine Protease Inhibitors Burçin Türkmenoğlu, Yahya Güzel

DAVETLİ
GENEL KONUŞMACILAR

Plenary Lectures

GDK-1

Prof.Dr. Saim Özkar

Özgeçmiş

1949 Elazığ doğumlu Saim Özkâr, 1967 yılında Elazığ Lisesini, 1972 yılında da İstanbul Teknik Üniversitesi Kimya Fakültesini bitirerek Kimya Yüksek Mühendisliği Diploması aldı. Lise ve üniversite öğrenimini TÜBİTAK burslusu olarak sürdürdü. İki yıl sanayide çalıştıktan sonra doktora öğrenimi için 1974 yılında Almanya'ya gitti. Münih Teknik Üniversitesi'nde organometalik kimya konusunda yaptığı çalışmayla Kasım 1976 da Doktorasını aldı. Yurda dönünce iki yıl kadar MTA Enstitüsü›nde çalıştı. Askerlik hizmetinden sonra 1979 yılında Orta Doğu Teknik Üniversitesi Kimya Bölümü'ne öğretim üyesi olarak girdi. Aynı üniversitede Kasım 1982 de Doçent ve Aralık 1988 de Profesör oldu. Alexander von Humboldt Vakfı bursiyeri olarak 1986 yılında Almanya Mülheim'daki Max Planck Enstitüsü'nde araştırmacı ve 1990-1988 yılları arasında Toronto Üniversitesi'nde misafir öğretim üyesi olarak çalıştı. 2000 Yılında Fulbright bursiyeri ve 2015 yılında ise ziyaretçi bilimci olarak Colorado Devlet Üniversitesi'nde (ABD) geçiş metal nanokümelerinin oluşum kinetiği ve mekanizması konularında araştırmalara katıldı. 1988-1985 Yıllarında TÜBİTAK'da Grup Yürütme Komitesi Sekreterliği görevini yürüttü, 1999-1993 Yıllarında TÜBİTAK-SAGE'de danışman olarak çalıştı. -1995 2000 Yıllarında TÜBİTAK Temel Bilimler Araştırma Grubu Yürütme Komitesi Üyeliği yaptı.

"Organometalik Bileşiklerin Sentezi, Yapısal Aydınlatılması, Fotokimyası ve Katalitk Özellikleri" konsunda ulaslararası düzeyde bilime üstün nitelikli katkılarından dolayı 1996 yılı TÜBİTAK Bilim Ödülünü aldı.

Prof. Dr. Saim Özkâr, 1996 yılından beri Türkiye Bilimler Akademisi asli üyesidir.

İlgi ve Çalışma Alanı: Geçiş Metal Nanokümeleri; Nanoküme Oluşumu; Homojen ve Heterojen Kataliz; Organometalik Kimya; Hidrojen Depolayan Malzemeler; Hidrojen Üretimi.

Prof.Dr. Saim Özkar

TEPKİMELERİ DÜŞÜK SICAKLIKTA KATALİZLEYEN GEÇİŞ METAL NANOKÜMELERİ

Saim Özkar

Orta Doğu Teknik Üniversitesi, Kimya Bölümü, 06800 Ankara

Yüzeydeki atomların sayısının toplam atom sayısına oranı büyük olan geçiş metal nanokümeleri [1], önemli tepkimelerde etkinliği yüksek katalizör olarak kullanılır [2]. Ancak geçiş metal nanokümeleri, termodinamik olarak kararlı değildir, topaklanarak daha büyük kümelere ve en sonunda da külçe metale dönüşür [3]. Geçiş metal nanokümelerinin topaklanması, katalitik etkinliğin hızlı düşmesine neden olur. Topaklanmayı önlemek için, metal nanokümelerinin topaklanmaya karşı kinetik olarak kararlı hale getirilmesi gerekir [4]. Kararlaştırıcı uygun ligantlar veya destek malzemeleri kullanılarak, etkin konumları engellemeden geçiş metal nanokümleri kinetik olarak kararlı hale getirilebilir. Kararlaştırıcı ligant çevresinin uygun tasarımı ile, geçiş metal nanokümeleri bir çok tepkime için yüksek katalitik etkinliğe sahip ve uzun ömürlü katalizör olarak geliştirilebilir [5]. Ligandın veya destek malzemenin uygun düzenlenmesiyle, katalitik etkinlikle kararlılık arasındaki denge ayarlanarak bazı önemli tepkimeleri düşük sıcaklıkta katalizleyebilen geçiş metal nanokümeleri sentezlenebilir. Bu sunumda, hidrojen üretimi, hidrojenlenme, dehidrojenlenme gibi örnek tepkimelerin oda sıcaklığında geçiş metal nanokümeleri ile nasıl katalizlendiği anlatılacaktır.

İlk örnek, oda sıcaklığında asetonun hidrojenlenmesini sağlayan iridiyum(0) nanokümelerinin katalizör olarak kullanılmasıdır. $[(COD)\ IrCl]_2$ formülündeki iridyum(I) öncülünün indirgenmesi ile oluşan iridyum(0) nanokümeleri ve hidrojen klorür, saf asetonun %100 seçicilikle oda sıcaklığında, %100 2-propanole hidrojenlenmesini sağlamaktadır [6]. İkinci örnek, rutenyum [7,8] ve iridyum(0) nanokümelerinin [9] aromatik bileşiklerin oda sıcaklığında hidrojenlenmesini katalizlemesidir.

Amonyak borandan hidrojen salımını oda sıcaklığında katalizleyebilen metal(0) nanokümelerinin hem katalitik etkinliklerinin artırılması hem de ömürlerinin uzatılması yönünde yürütülen çalışmalar anlatılcaktır [10,11]. Özellikle değişik şekillerde kararlılaştırılmış nikel(0), kobalt(0), rutenyum(0), palladyum(0) ve rodyum(0) nanokümelerinin katalizör olarak kullanıldığı amonyak boranın dehidrojenlenmesindeki en son bulgular tartışılacaktır [12].

Son olarak formik asidin dehidrojenlenmesini oda sıcaklığında katalizleyen palladium(0) nanokümelerinin sentezine ait sonuçlar sunulacaktır. Uygun bir destek yüzeyine tutundurulmuş palladyum(0) nanpkümelerinin, oda sıcaklığında formik asitten hidrojen üretiminde etkinliği yüksek ve uzun ömürlü katalizör olarak davrandığı anlatılacaktır.

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GDK-2

Prof.Dr. Yusuf Baran

Özgeçmiş

Dr. Yusuf Baran, 11 Aralık 1977 yılında doğdu. 1998 yılında Dicle Üniversitesi, Biyoloji Öğretmenliği Bölümü'nden mezun olduktan sonra Yüksek Lisans ve Doktora derecelerini 2002 ve 2006 yıllarında Orta Doğu Teknik Üniversitesi'nden aldı. Doktora çalışmaları esnasında Kuzey Atlantik Savunma Paktı'ndan (NATO) aldığı özel bir burs ile Amerika Birleşik Devletleri, Medical University of South Carolina'da (2005 Temmuz2006- Şubat) misafir araştırmacı olarak çalıştı. 2015-2007 yılları arasında İzmir Yüksek Teknoloji Enstitüsü, Moleküler Biyoloji ve Genetik Bölümü'nde öğretim üyesi olarak çalıştı.

Prof. Dr. Yusuf BARAN'ın fonlanan 30'un üzerinde bilimsel araştırma projesi, 300'ün üzerinde bilimsel makalesi, ulusal ve uluslararası kongrelerde sunulmuş bildirisi ve 100'ün üzerinde ulusal ve uluslararası ödülü vardır. Bu ödüllerden bazıları; 2007 yılında Orta Doğu Teknik Üniversitesi'nden "Yılın Tezi Ödülü", 2010 yılında Türkiye Bilimler Akademisi'nden "Yılın Üstün Başarılı Genç Bilim İnsanı Ödülü", 2013 Yılında Bilim Kahramanları Derneği'nden "Yılın Genç Bilim İnsanı Ödülü"', 2014 yılında Uluslararasaı Genç Liderler ve Girişimciler Derneği'nden "Bilimsel Önderlik Alanında Türkiye'nin En Başarılı İnsanı Ödülü", 2015 yılında Güven Hastanesi'nden "Genç Bilim İnsanı Proje Destek Ödülü" ve Eczacıbaşı Holding'ten "Bilimsel Araştırma Destek Ödülü"dür.

Dr. Baran, 2013 Yılında, Dünya Ekonomik Forumu'ndan «2013 Yılın Genç Bilim İnsanı Ödülü"nü almıştır. Bu ödül, her yıl tüm dünyadan «akademik mükemmeliyet, topluma hizmet ve bilim ile dünyayı değiştirme potansiyeli» bulunan 40 yaşın altındaki 40 lider genç bilim insanına verilmektedir.

Dr. Baran, 2015 yılında ise dünya çapında üstün başarılı bulunan 40 yaş altı 25 genç bilim insanından biri seçilerek Dünya Bilimler Akademisi'ne seçilmiştir.

Prof. Dr. Yusuf Baran'ın araştırmaları kanser moleküler biyolojisi, çoklu ilaç direnç mekanizmaları ve direnci geri çevrilmesi ve bilim ve teknoloji politikaları üzerine yoğunlaşmaktadır.

2015 Yılının Şubat ayından beri Abdullah Gül Üniversitesi, Yaşam ve Doğa Bilimleri Fakültesi Dekanı ve Moleküler Biyoloji ve Genetik Bölümü Başkanı olarak çalışmaktadır.

KANSERİN MOLEKÜLER BİYOLOJİSİ / KANSERDE İLAÇ DİRENÇLİLİĞİ

Prof. Dr. Yusuf BARAN[1,2]

[1]*Abdullah Gül Üniversitesi, Yaşam ve Doğa Bilimleri Fakültesi, Moleküler Biyoloji ve Genetik Bölümü, Sümer Kampüsü, Kayseri*

[2]*İzmir Yüksek Teknoloji Enstitüsü, Moleküler Biyoloji ve Genetik Bölümü, Gülbahçe Kampüsü, Urla, İzmir*

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Son dönemlerde insan ölümlerinde kalp hastalıklarından sonra ikinci sıraya yerleşen kanserin tedavisinde kullanılan en yaygın yöntem kemoterapidir. Ancak kanserli hücre ve dokuların uygulanan antikanser ajanlara karşı tedavinin başında veya ilerleyen dönemlerinde geliştirdikleri hücresel dirençlilik mekanizmaları, kanser tedavisinde başarıyı

Prof.Dr. Yusuf Baran

önemli ölçüde engelleyen ciddi bir problemdir. Kanserli hücrelerde yoğun olarak gözlenen ilaç dirençliliğinin, uygulanan ilaca ve kanser türüne göre değişen farklı moleküler genetik ve biyokimyasal nedenleri vardır. Kanser hücrelerinde meydana gelen ikincil genetiksel değişim ve bozukluklar, ilaç dirençliliği ile sonuçlanabilmektedir. Dirençlilik mekanizmalarından biri bloke edildiğinde, kanser hücreleri diğer mekanizmaları etkin kılmaya çalışarak dirençli hale gelebilmekte ve böylece sürekli sağkalmaya çalışmaktadırlar. Bu nedenle, kanserde ilaç dirençliliği çalışmalarında hücresel mekanizmaları bir bütün olarak göz önüne almak ve incelemek son derece önemlidir.

Çoklu ilaç dirençliliğine yol açan muhtemel mekanizmalar, artan ilaç atımına ya da azalan ilaç alımına bağlı hücre içi ilaç birikiminde meydana gelen azalmalar, antikanser ajanın hedeflediği bölgede meydana gelen yapısal değişimler, ilacın hedeflediği molekülün hücre içi miktarındaki artışlar veya hedef molekülün tümü ile ortamdan uzaklaştırılması, apoptozu kontrol eden genlerin ekspresyon düzeylerindeki değişimler, seramid metabolizmasında meydana gelen bozukluklar, DNA hasar tamirindeki artışlar ve ilaç metabolizması ile ilgili problemler olarak bilinmektedir.

Çoklu ilaç dirençliliğine neden olan mekanizmaların belirlenmesi, dirençliliğin moleküler ve biyokimyasal yöntemlerle geri çevrilmesinin önünü açacak ve dolayısı ile kanser tedavisinde daha etkili ajanlar geliştirilerek sağkalımda ve yaşam kalitesinde önemli artışlar sağlanacaktır.

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GDK-3

Prof. Dr. Ertuğrul Arpaç

Özgeçmiş

EĞITIM BILGILERI:

Hamburg Üniversitesi Kimya Fakültesi Yüksek Lisans –1977
Hamburg Üniversitesi Kimya Fakültesi Yüksek Lisans –1979
Hamburg Üniversitesi Kimya Fakültesi Doktora –1982

AKADEMİK/MESLEKTE DENEYİM

Hamburg Üniversitesi–Kimya Bölümü -Araştırma Görevlisi –1980/1982
İnönü Üniversitesi –Fen Edebiyat Fakültesi Kimya Bölümü -Öğretim Görevlisi –1983/1984
İnönü Üniversitesi –Fen Edebiyat Fakültesi Kimya Bölümü -Yard. Doç. –1984/1986
İnönü Üniversitesi –Fen Edebiyat Fakültesi Kimya Bölümü -Doç.Dr. –1986/1991
Akdeniz Üniversitesi –Fen Edebiyat Fakültesi Kimya Bölümü -Doç.Dr. –1991/1992
Institut für Neue Materialien –Saarbrücken Almanya –1991/2006
Institut für Silikat Forschung –Fraunhofer –Almanya –1988 / 1990
Akdeniz Üniversitesi –Fen Fakültesi Kimya Bölümü -Prof.Dr. –1992/ Devam Ediyor

UZMANLIK ALANLARI

Sol-Jel Kimyası, Nano Toz Sentezi, Nano Teknoloji, Fonksiyonel Yüzey Kaplama Malzemeleri
60 SCI yayın, >120 patent, >100 ulusal/uluslararası proje

Prof. Dr. Ertuğrul Arpaç

BİYOMALZEME GELİŞTİRME ÇALIŞMALARI

Ertuğrul Arpaç

Akdeniz Üniversitesi Fen Fakültesi Kimya Bölümü, Antalya

BİYOMALZEME GLOBAL PAZARI

- Piyasa 300.000'den fazla ürünle inovasyona açık bir sektördür.
- 2012'de **44milyar USD** olan pazar büyüklüğünün 2017'de **88,4milyar USD**'ye, 2020'ye kadar **115milyar USD** çıkması tahmin ediliyor.
- **2014-2020** arası tahmini **büyüme hızı: %13-15.**

VÜCUDA TAKILAN BİYOMALZEME

- 2014'de büyüklüğü **79,1milyar USD** olan pazarının,
- 2022'da **133milyar USD**'ye ulaşması ön görülüyor.
- **2014-2022** arası tahmini **büyüme hızı: 6,73%.**

MEDİKAL KAPLAMA GLOBAL PAZARI

- 2013'de büyüklüğü 9,1milyar USD olan pazarın 2019'da 13,6milyar USD ulaşması öngörülüyor. 2014-2019 arası tahmini büyüme hızı: 6,5%.
- Pazarın %70'i USA ve Avrupa firmalar tarafından paylaşılıyor.

Ekibimiz kimya ve malzeme biliminin kesiştiği alanlarda **FONKSİYONEL YÜZEY KAPLAMALARI** ve **MALZEME GELİŞTİRME** konusunda uzmanlaşmış bir gruptur. Şu ana kadar ulusal ve uluslar arası firmalar için geliştirdiği teknolojik ürünler, bugün sağlık alanından kullanılmaktadır.

Sunumda bu alanda geliştirdiğimiz ürünlerin bir kısmını tanıtılacaktır.

GDK-4

Prof.Dr. Oğuz Okay

Özgeçmiş

Oğuz OKAY 1977 yılında İstanbul Üniversitesi Kimya Yüksek Mühendisliği Bölümünden mezun olmuş, ardından 1981 yılında Viyana Teknik Üniversitesi Makromoleküler Kimya Enstitüsü'nden doktora ünvanını almıştır.

TÜBİTAK Marmara Araştırma Merkezi, Doğu Akdeniz Üniversitesi, Kocaeli Üniversitesi, Stuttgart Üniversitesi, Colorado Üniversitesi, Clausthal Teknik Üniversitesi, Dresden Teknik Üniversitesi, Helmholtz Zentrum Berlin'de çeşitli süreler çalışan OKAY, 1998 yılından bu yana İstanbul Teknik Üniversitesi Fen-Edebiyat Fakültesi Kimya Bölümünde öğretim üyesi olarak görev yapmaktadır.

Türkiye Kimya Derneği Şeref Üyesi olan OKAY, 1990 yılında TÜBİTAK Teşvik Ödülünü, 1994 yılında Sedat Simavi Fen-Bilimleri Ödülünü, 2005 yılında TÜBİTAK Bilim Ödülünü, ve 2015 yılında Almanya'dan Georg-Forster Araştırma Ödülünü almıştır.

Türkiye Bilimler Akademisi (TÜBA) Asli Üyesi olan Oğuz OKAY'ın 4 patenti ve Science Citation Index'ce taranan hakemli dergilerde 160 civarında yayını çıkmış olup bu yayınlara 5000'in üzerinde atıf yapılmıştır. OKAY'ın son zamanların popular bilim göstergesi olan H-indeks değeri 40'dır.

Prof.Dr. Oğuz Okay

YENİ NESİL BİYOUYUMLU JELLER VE POLİMER İSKELETLERİ

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Biyolojik sistemlere büyük benzerlik gösteren hidrojellerin doku mühendisliğinde, yapay organlarda kontrollu salınım sistemlerinde, sensör ve harekete geçiricilerde geniş bir potansiyel kullanım alanları vardır. Ancak, kıkırdak, kornea gibi çoğu biyolojik jel kompozitlerine oranla sentetik hidrojellerin mekanik dayanımları son derece yetersizdir. Diğer yandan intervertebral disk (IVD) gibi doğal biyolojik jellerin sadece mekanik dayanımları yüksek değil, aynı zamanda anizotropik mekanik özelliklere haizdir. Şekil-hafıza özelliği, yani malzemenin kalıcı şeklinin yanı sıra bir veya iki tane de geçici şeklinin olması, şekillerini hafızasında tutması ve istendiğinde bir şekilden diğerine dönmesi özellikle biyomedikal alanda istenen bir özelliktir. Ayrıca, biyolojik sistemlerde gözlenen kendi-kendini onarma davranışının sentetik polimer malzemelerde de yaratılması da malzemelerin kullanım ömrünü uzatmaktadır. Dolayısıyla, mekanik dayanımı biyolojik jel kompozitlerine eşdeğer, şekil hafızalı, kendini onarabilen, anizotopik ve biyouyumlu jellerin ve polimer iskeletlerinin geliştirilmesi üzerine son yıllarda yoğun araştırmalar yapılmaktadır.

Bu konuşmada mekanik özellikleri biyolojik jel kompozitlerine eşdeğer biyouyumlu jeller ve polimer iskeletleri konusunda dünyada son ilerlemeler ve laboratuvarımızda son yıllarda geliştirilen malzemeler tartışılacaktır [1-8]. İpek fibroin, hyaluronik asit, DNA, nişasta, poli(N,N-dimetilakrilamid), ve poliakrilikasit esaslı malzemelerin kriyojelleşme [1], çift-ağyapı, [2] ve üç-ağyapı teknikleri ile uygun koşullarda eldesi ile homojen veya makrogözenekli, üstün mekanik özelliklere sahip jeller elde edilebilmektedir [3-8]. Kimyasal çapraz bağlar yerine jel içerisinde polimer ağyapı zincirlerini birbirlerine bağlayan kristalin bölgelerin yaratılması ve kristallerin tersinir çapraz bağ işlevi göstermesi sonucu, malzemeler hem şekil-hafıza hemde kendini onarma özelliğine haizdir. Parçalanma enerjisi 20 kJ/m^2 değerine kadar ulaşan biyouyumlu jeller IVD protezi olarak kullanıma aday bir malzemedir. Diğer yandan mekanik dayanımı yüksek, biyouyumlu ipek fibroin iskeletleri kemik doku mühendisliği uygulamaları için geliştirilmiştir.

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GDK-5

Prof.Dr. Metin Balcı

Özgeçmiş

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1996-1997 : Fulbright Visiting Professor, **Alabama** Üniversitesi, **USA**.
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1. TÜBITAK Teşvik Ödülü, **1983.**
2. TÜBITAK Bilim Ödülü, **1989**.
3. Bilim ve Teknoloji Vakfı Bilim Ödülü, **1990**.
4. Kültür Bakanlığı Bilim Ödülü, **1991**
5. TÜBA (Türkiy Bilimler Akademis) Asli Üyeliği**, 1994.**
6. Yılın Eğitimcisi Ödülü, Orta Doğu Teknik Üniversitesi **1999, 2003, 2004**.
7. Orta Doğu Teknik Üniversitesi "**Üstün Başarı Ödülü**" 2000, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015.
8. Prof. Dr. Balcı'nın isminin Atatürk Üniversitesi Kimya Bölümü NMR Laboratuvarına verilişi **Mart 2010**.

5. YAYINLAR
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5. **39** Doktora tezi ve **60**'ın üzerinde Yüksek Lisans Tezi **21 Post-doc**

6. ARAŞTIRMA SAHALARI
- Doğal ürün total sentezi
- Yüksek sıcaklık brominasyonu
- $Mn(OAc)_3$ Oksidasyonu
- Gerilimli Hidrokarbonlar
- Heterosiklik Bileşikler

Prof.Dr. Metin Balcı

ORGANOGOLD CHEMISTRY: APPLICATION TO THE SYNTHESIS OF VARIOUS HETEROCYCLES WITH NEW SKELETONS

Metin Balcı

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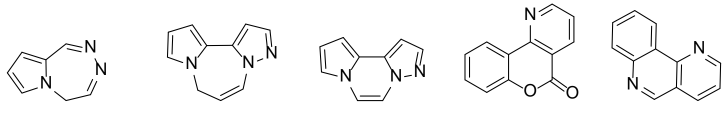
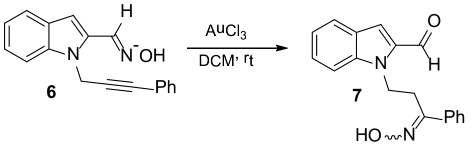
Heterocycles are the most important structural classes of chemical compounds, and they are particularly well presented among pharmaceuticals. As part of our research program on the design and synthesis of heterocycles with new skeletons we tried to model a new methodology. The key feature of this methodology was the synthesis of N-propargyl pyrrole and indole derivatives substituted at the C-2 position with pyrrole or pyrrole units. Gold-catalyzed cyclization or NaH-supported cyclization resulted in the formation of compounds **1-5** [1-8].



1 **2** **3** 4 5

Figure 1: Structures of some synthesized compounds.

The gold-catalyzed reaction of pyrrole and indole oximes having N-propargyl group transferred the oxime functionality intramolecularly from one carbon atom to another carbon atom via 7-endo-dig cyclization process. This transformation is unprecedented in the literature and was named as oxime-oxime rearrangement [6].



6 **7**

Figure 2: Oxime-Oxime Rearrangement

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DAVETLİ
ALAN KONUŞMACILARI

Invited Lectures

DAK-1

Prof.Dr. Süleyman Patır

Özgeçmiş

12.12.1953 tarihinde Balıkesir'de doğdu. Lise eğitimini Balıkesir Muharrem Hasbi Lisesi'nde tamamladı. 1981 yılında Frankfurt Johann Wolfgang Goethe Üniversitesi Kimya Bölümünde diploma derecesini aldı. Yine aynı üniversitede 1987 yılında "indol alkaloidlerinin sentezi" ile ilgili çalışmalarıyla doktora derecesini aldı. 1988'de vatani hizmetini tamamladıktan sonra, 1989 yılında Hacettepe Üniversitesi Kimya Öğretmenliği Anabilim Dalı'nda yardımcı doçent olarak Türkiye'deki akademik çalışmalarına başladı. 1995 yılında doçent, 2001 yılında profesörlüğe atandı. 2010 yılında üniversiteden emekliye ayrıldı. İndol alkaloidlerinin total sentezi başlıca çalışma konusudur.

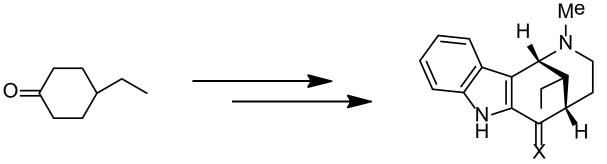
Prof.Dr. Süleyman Patır

İNDOL ALKALOİDLERİNİN SENTEZİNDE YENİ YAKLAŞIMLAR - ULEİN ALKALOİDLERİNİN SENTEZİ

Prof. Dr. Süleyman PATIR

Emekli Öğretim Üyesi
Hacettepe Üniversitesi
Kimya Öğretmenliği Anabilim Dalı

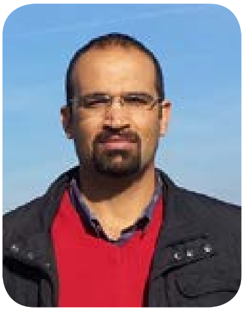
Doğal ürünler, biyolojik aktiviteleri ve karmaşık yapıları nedeniyle uzun zamanlardan beri farklı disiplinlerden araştırmacıların ilgi odağı olmayı sürdürmektedir. Geçen zaman içinde, doğal ürünler ve analoglarının total sentez çalışmaları, yeni stratejilerin (atom ekonomik, basamak ekonomik, redoks ekonomik, ölçeklenebilir, koruma grubu içermeyen, stereoseçici) geliştirilmesiyle "ideal sentez" hedefine doğru evrilmektedir. Birçok üyesi olan indol alkaloidlerinden *Strychnos* türü alkaloidlerin her geçen gün yeni özellikleri keşfedilmektedir. Ulein-türü *Strychnos* alkaloidlerinin sentezine yönelik olarak son yıllarda geliştirdiğimiz, *divergent*, stereoseçici, etkin ve ölçeklenebilir yöntemler sunulmaktadır.



$X = \alpha\text{-}OH, \beta\text{-}H$
$X = O$
$X = CH_2$

DAK-2

Prof.Dr. Atilla Cihaner



Özgeçmiş

6 Nisan 1977'de Ankara'da doğan Atilla Cihaner, lise eğitimini 1993 yılında Ankara Bahçelievler Deneme Lisesi'nde tamamladıktan sonra, Orta Doğu Teknik Üniversitesi Kimya Bölümü'nden 1998 yılında mezun olmuştur. Aynı bölümde yüksek lisans ve doktara derecelerini sırasıyla 2000 ve 2004 yıllarında almıştır. 1999 ylında Atılım Üniversitesi'nde araştırma görevlisi olarak çalışan Dr. Cihaner aynı üniversitede 2009 ,2004 ve 2014 yıllarında sırasıyla yardımcı doçent, doçent ve profesör kadrolarına atanmıştır. 2014 yılından itibaren Atılım Üniversitesi, Mühendislik Fakültesi, Kimya Mühendisliği ve Uygulamalı Kimya Bölümü'nde öğretim üyesi olarak görev yapmaktadır.

Dr. Cihaner'in çalışma konuları konjuge ve elektrokromik polimerlerin sentezi, tanımı ve optoelektronik uygulamaları, yeni monomer tasarımları, sentezi ve polimerizasyonları, adli-tıp bilimi ve analitik kimya alanında kullanılabilir kemiluminesans ve akıllı algılayıcıların sentezi üzerinedir. Dr. Cihaner bu bilimsel ve akademik çalışmaları nedeniyle, 2010 yılında Türkiye Bilimler Akademisi TÜBA-GEBİP, 2012 yılında ODTÜ Prof. Dr. Mustafa N. Parlar Eğitim ve Araştırma Vakfı Araştırma Teşvik ve İTÜ FABED Eser Tümen Üstün Başarı ödüllerine layık görülmüştür. Ayrıca *"Kimya ve malzeme bilimleri alanında, elektrokromik polimerler konularındaki uluslararası düzeyde üstün nitelikli çalışmaları"* nedeniyle 2015 yılında TÜBİTAK Teşvik Ödülü'nü almıştır. Dr. Cihaner aynı zamanda American Chemical Society (ACS), Materials Research Society (MRS) ve Türkiye Polimer Bilimi ve Teknolojisi Derneği üyesidir.

Dr. Atilla Cihaner, Atılım Üniversitesi, Kimya Mühendisliği ve Uygulamalı Kimya Bölümü bünyesinde kurulan Atılım Opto-elektronik Malzemeler ve Solar Enerji Laboratuvarı'nda (ATOMSEL) gerek optoelektronik cihazlar gerekse akıllı malzemeler, adli-tip ve hidrofobik konuları üzerine çalışmalarını sürdürmeye devam etmektedir.

Prof.Dr. Atilla Cihaner

FONKSİYONEL KONJÜGE POLİMERLERİN SENTEZİ VE UYGULAMA ALANLARI

Atilla Cihaner

Malzemeler daima toplumların gelişmesinde büyük bir rol oynamıştır, **öyle ki bazı** malzemeler tarih öncesi dönemlere isimlerini vermiştir: Taş Devri, Bronz Çağı, Demir Çağı vb. Eğer bugünkü modern dünyanın yaşadığı çağ bir malzemenin ismi ile anılacak olsaydı kuşkusuz bu isim "Polimer Çağı" olacaktı. Bugün sayıları gittikçe artan işlevsel polimerik malzemelerle, enerji, çevre kirliliği ve iletişim alanlarındaki temel sorunların aşılması hedeflenmektedir. Bu tür sorunları aşmak için önemli ilerlemeler ve/veya iyileştirmeler yapabilecek bilimsel temellere sahip yeni yaklaşımlara ihtiyaç duyulmaktadır. Bu yaklaşımlardan biri 1977 yılında iletken polimerlerin (iletken plastikler) katkılandırılabilmesiyle (iletkenlik değeriyle oynanabilmesi) ile gerçekleştirmiştir. Yaklaşık yarım yüzyıla sahip bir geçmişe sahip olmasına rağmen iletken polimerlerin hala ilgi odağı olmalarının sebebi, sahip oldukları özelliklere (işlenebilirlik, kararlılık, ayarlanabilir elektronik ve optiksel özellikler vesaire) amaca yönelik olarak müdahale edilebilmesidir. Bu nedenle iletken polimerler ileri teknolojik malzemeler olarak tanımlanmakta ve birçok bilim insanının dikkatini çekmeye devam etmektedir.

Tasarım aşamasında bu tür malzemelerin başlangıç birimleri (monomerler) amaca yönelik olarak tasarlanır ve sentez yöntemi belirlenir. Düne kadar rüya olarak görülen uygulama alanları bugün iyi tasarlanmış monomerler sayesinde hayata geçirilebilmektedir: (biyo)sensörler, yapay kaslar, alan etkili transistörler, süperkapasitörler, güneş pilleri, ışık saçan diyotlar (LEDler), ekranlar ve elektrokromik cihazlar, vesaire.

ATOMSEL çalışma grubu iletken polimer ailesine farklı özellikte yeni üyeler kazandırmıştır (Şekil 1). Luminol adı verilen ve adli-tıpta kan bulgularında kullanılan bu belirteçe alternatif yeni belirteçler sentezlenmiş ve bu belirteçlerden elde edilen polimerlerle literatüre "*luminol tipi polimerler*" isimli yeni bir üye kazandırılmıştır. Ayrıca elektron verici-alıcı-verici (V-A-V) sisteminde sentezlenen bir dizi monomer ile heteroatomların ilgili monomerlerin ve polimerlerinin gerek optiksel gerekse elektrokimyasal özelliklerine etkisi incelenmiş ve elektrokromik polimerler adına literatürün öncüsü denilebilecek yeni nötr halde yeşil ve cam göbeği renkli polimerler sentezlenebilmiştir. Renk karışımı teorisi uygulanarak RGB ve CMYK renk skalasının tamamı elde edilebilmiştir.

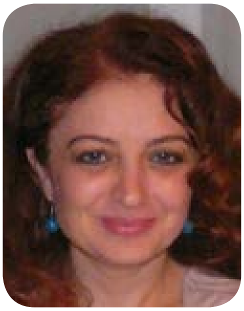
Diğer bir taraftan literatürün ilk çözünür alkilendioksiselonofen türevleri polimerleştirilebilmiş ve elektro-oıptik özellikler bakımından politiyofen ailesine olan üstünlükleri deşifre edilebişmiştir. Bu polimerler sayesinde "gerçek mavi" renk elde edilebilmiştir, zira ilgili politiyofen türevleri koyu lacivert veya menekşe renklerine sahiptirler.

Son olarak iletken polimer ailesinde çoğunlukta kullanılan poli(3,4-etilendioksitiyofen) (PEDOT) polimeri yeni bir yaklaşımla tamamen çözünür hale getirilmiş ve bu yeni polimer mevcut özellikleriyle PEDOT'tan çok daha üstün özellikler göstermiştir.

Şekil **1.** V-A-V tipi monomerler.

DAK-3

Doç.Dr. Selmiye Alkan Gürsel



Özgeçmiş

Dr. Selmiye Alkan Gürsel, lisans derecesini Orta Doğu Teknik Üniversitesi Kimya Eğitimi Bölümü'nden, yüksek lisans ve doktora derecelerini ise Orta Doğu Teknik Üniversitesi Kimya Bölümü'nden aldı. Doktora çalışmaları sırasında, Florida Üniversitesi'nde (ABD) elektrokromik polimerler konusunda araştırmalar yaptı. 2003-2007 yılları arasında İsviçre'de Paul Scherrer Institut'ta *yakıt pilleri* konusunda doktora sonrası çalışmalar gerçekleştirdi. Dr. Gürsel, 2008 yılından bu yana Sabancı Üniversitesi'nde öğretim üyesi olarak çalışmalarını sürdürmektedir. Dr. Gürsel, PEM yakıt pilleri, proton değişim membranları, grafen esaslı elektrotlar, Li-iyon pilleri için elektrotların geliştirilmesi, yapay kaslar için nanofiber/nanoparçacık esaslı malzemeler, radyasyonla aşılama ve iletken polimerler konularında bilimsel çalışmalar yapmaktadır. Dr. Gürsel'in, uluslararası hakemli dergilerde yayınlanan 55'den fazla makalesi ve bu makalelere aldığı 1550'ün üzerinde atıf vardır. Ayrıca 2008 yılında basılmış bir kitap bölümü ve 6 patenti bulunmaktadır. Dr. Gürsel, 2010 yılında *Türkiye Bilimler Akademisi tarafından desteklenen L'Oréal Türkiye Genç Bilim Kadınlarına Destek Bursları 2010 Ödülü*, 2012 yılında *ODTÜ Prof. Dr. Mustafa N. PARLAR Eğitim ve Araştırma Vakfı Araştırma Teşvik ödülü* ve 2013 yılında *Bilim Akademisi Genç Bilim İnsanları Programı (BAGEP) Burs Ödülü* 'ne layık görülmüştür. Dr. Gürsel, ayrıca Avrupa Komisyonu, FET Amiral Gemisi Projelerinden biri olarak seçilen ve ''yüzyılın projesi" olarak adlandırılan Grafen Flagship Projesi'nde deTürkiye'den proje yürütücüsü olarak yer almaktadır. Dr. Gürsel Frontiers in Energy Research-Energy Storage dergisinin editörler komitesinde yer almaktadır. Dr. Gürsel evli ve 2 çocuk annesidir.

Doç.Dr. Selmiye Alkan Gürsel

GRAPHENE SUPPORTED PT NANOPARTICLES AS ELECTROCATALYSTS FOR PEM FUEL CELLS

Vildan BAYRAM[a], Lale IŞIKEL ŞANLI[b], Begüm YARAR[a], Emre BİÇER[b], Esaam JAMIL[a], Veera SADHU[b], Sajjad GHOBADI[a], Elif DAŞ[c], Ayşe BAYRAKÇEKEN YURTCAN[c,d], Hamid EREN[e], Necmi BIYIKLI[e] and Selmiye ALKAN GÜRSEL[a,b]

[a]Faculty of Engineering &Natural Sciences, Sabanci University,Turkey
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[c]Department of Nanoscience and Nanoengineering, Atatürk University, Turkey
[d]Department of Chemical Engineering, Atatürk University, Turkey
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Polymer electrolyte membrane (PEM) fuel cells are attractive for various applications and platinum (Pt) nanoparticles, used as catalyst in PEM fuel cells, have high cost, performance problems and also low abundance [1]. Catalyst support materials are of great importance in regulating the properties of catalyst nanoparticles such as shape, size, and dispersion. Carbon black, the most commonly used commercial catalyst support, has several limitations which cause the degradation of catalyst activity and performance. The use of graphene as the catalyst support due to their high surface area, high conductivity and chemical stability, could lead to an improvement in both catalytic activity and catalyst utilization in PEM fuel cells. In the present work, graphene nanoplatelets and reduced graphene oxide have been employed as the catalyst support. Graphene supported Pt nanoparticles were prepared by means of impregnation, supercritical carbon dioxide deposition, electrospinning/electrospraying and atomic layer deposition methods. The preparation of highly dispersed and uniformly decorated Pt nanoparticles with a small particle size (2-3 nm) was achieved. Moreover, significantly better electrocatalytic activity and fuel cell performances for graphene based electrodes (with relatively lower Pt loading) were obtained [2-4].

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DAK-4

Prof.Dr. Mustafa Soylak

Özgeçmiş

Erciyes Üniversitesi Fen-Edebiyat Fakültesi Kimya Bölümünü, 1988'de bitirdi. 1990 yılında Bilim Uzmanı; 1993 yılında Doktor Unvanı aldı. 1989'de Erciyes Üniversitesi Fen-Edebiyat Fakültesi Kimya Bölümüne Araştırma Görevlisi, 1995'de Yardımcı Doçent, Kasım 1997'de Doçent, Mart 2003'de Profesör oldu. 2001-2005 yılları arasında Erciyes Üniversitesi Teknoloji Araştırma ve Uygulama Merkezi Müdürlüğünü yürüttü. 2007-2013 yılları arasında Erciyes Üniversitesi Fen Fakültesi Kimya Bölüm Başkanlığı yaptı.

Ayırma, zenginleştirme, türlemdirme teknikleri ve çevre örneklerinde ağır metal tayinleri ana çalışma konularını oluşturmaktadır. SCI kapsamında çok sayıda makalesi, iki kitabı ve iki ders notu bulunmaktadır. Çalışmalarına Web of Science tarafından taranan dergilerde 16000'den fazla atıf yapılmıştır. H sayısı 74'dir. 2014 ve 2015 yıllarında Thomson Reuters tarafından hazırlanan "Dünyanın En Nüfuzlu Bilim İnsanları" listesinde yer aldı. International Journal of Environmental Analytical Chemistry, Arabian Journal of Chemistry, Turkish Journal of Chemistry ve Journal of Hazardous Materials gibi SCI kapsamındaki çeşitli dergilerin Editorial Board 'ında yer aldı.

TÜBİTAK burslusu olarak İspanya'da (Cordoba Üniversitesi-1997) eser element zenginleştirme ve akışa enjeksiyonlu teknikleri üzerinde çalışmalar yapmıştır. 2010' dan beri King Saud Universitesi'nde (Suudi Arabistan) visiting profesör'dür. Temel Bilimler alanında 2001 TÜBİTAK Teşvik Ödülü almıştır. Evli ve bir çocuk babasıdır.

Prof.Dr. Mustafa Soylak

KİMYASAL ANALİZDE YENİ GELİŞMELER: MİKROEKSTRAKSİYON TEKNİKLERİ VE YENİ NESİL ÇÖZÜCÜLER

Mustafa Soylak

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Eser düzeydeki organik ve inorganik türlerin aletli analiz yöntemleri ile tayinleri öncesi katı faz ekstraksiyonu, membran filtrasyonu, elektroanalitik teknikler, birlikte çöktürme ve bulutlanma noktası ekstraksiyonu gibi ayırma ve zenginleştirme yöntemleri, analitlerin derişimlerinin artırılması ve matriks etkilerinin giderilmesi için kullanılmaktadır [1-3].

Yaklaşık son on yıldır mikroektraksiyon teknikleri, mikrolitre düzeyde çözücülerin kullanılmasından dolayı çevre dostu olmasından, kolaylığından ve diğer avantajlarından dolayı, eser türlerin ayırma, türleme ve zenginleştirilmesinde önemli bir yer almaktadır [3]. Mikroekstrasiyon çalışmalarında supramoleküler çözüler (SUPRAS), deep eutectic çözücüler (DES) and switchable çözücüler (SHS) gibi yeni nesil çözücülerin kullanılması bu çalışmalara yeni katkılar sağlamaktadır. Yine mikroekstraksiyon tekniklerinin katı faz ekstraksiyon teknikleri ile kombinasyonu katı faz mikroekstraksiyon çalışmalarında da yeni gelişmelerin önünü açmıştır

Bu sunumda eser düzeydeki analitlerin ayırma, türleme ve zenginleştirilmesinde çevre dostu sayılabilecek mikroekstrasiyon ve katı faz mikroekstraksiyon tekniklerindeki yeni gelişmeler ve yaklaşımlar ile bu çalışmalarda kullanılan yeni nesil çözücüler örneklerle tartışılacaktır.

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DAK-5

Prof.Dr. Erdal Bedir

Özgeçmiş

Doğum Yeri, Tarihi : Ordu, 1971

Eğitim Bilgileri

Lisans: Hacettepe Üniversitesi, Eczacılık Fakültesi, 1992

Yüksek Lisans: Hacettepe Üniversitesi, Sağlık Bilimleri Enstitüsü (Farmakognozi), 1995

Doktora: Hacettepe Üniversitesi, Sağlık Bilimleri Enstitüsü (Farmakognozi), 1998

Meslek Bilgileri

Araştırma Görevlisi: Hacettepe Üniversitesi, Eczacılık Fakültesi, Farmakognozi Anabilim Dalı, 1993-2001**Profesör:** Ege Üniversitesi, Mühendislik Fakültesi, Biyomühendislik Bölümü, 2007- Devam ediyor

Post Doc: Univ. of Mississippi, National Center for Natural Products Research, 1999-2001

Research Scientist: Univ. of Mississippi, National Center for Natural Products Research, 2001-2003

Doçent: Ege Üniversitesi, Mühendislik Fakültesi, Biyomühendislik Bölümü, 2003- 2007 **Profesör:** Ege Üniversitesi, Mühendislik Fakültesi, Biyomühendislik Bölümü, 2007- 2016

Profesör: İzmir Yüksek Teknoloji Enstitüsü, Mühendislik Fakültesi, Biyomühendislik Bölümü, Mayıs 2016- Devam ediyor

Prof.Dr. Erdal Bedir

TANIMLANAMAMIŞ BİR BİTKİ KÖKÜNDEN KATMA DEĞERİ YÜKSEK FİTOKİMYASALLARA ve İLAÇ ADAYI BİLEŞİKLERE

Erdal Bedir

İzmir Yüksek Teknoloji Enstitüsü, Mühendislik Fakültesi, Biyomühendislik Bölümü, Urla, 35430-İzmir

Yetişen 10.000'den fazla bitki türü ve %30'a varan endemizm oranı ile Türkiye, Avrupa, Kuzey Afrika ve Orta Doğu göz önüne alındığında bitki çeşitliliği yönünden en zengin ülkedir. Türkiye coğrafyasının yaklaşık olarak 1⁄4'ü ormanlar ile kaplıdır ve ülkemizde yetişen tıbbi bitkilerin oldukça büyük bir kısmı, orman bölgelerimizde orman tali ürünü veya odun dışı orman ürünü olarak köylüler tarafından toplanmakta, hammadde veya yarı-hammadde olarak toptancılara satılmaktadır. Köylülerden toplanan bu ürünlerin çoğu da uygun şekilde işlendikten sonra (kurutma-parçalama-paketleme) yurtdışına ihraç edilmektedir. Bu ihraç ürünleri yurtdışında gıda, ilaç ve kozmetik sanayinde değerlendirilmekte ve maalesef katma değeri yüksek ürünler olarak ithal edilerek iç piyasada kullanılmaktadır. Ülkemiz kendi öz kaynaklarını uygun şekilde işleyip katma değeri yüksek ürün haline getiremediği için büyük ekonomik kayba uğramaktadır.

Bitkisel kaynaklarımızın hammadde üretimi açısından değerlendirilmesi için gerekli araştırma geliştirme çalışmalarının yürütülmesi ve sanayi ile işbirliğine gidilerek mevcut birikimin büyük ölçekte üretime geçişte kullanılması noktasında, doğal ürün kimyası araştırıcılarına büyük iş düşmektedir.

Sunumumda, bu alanda araştırmalar yapan bir bilim insanı olarak, bilinmeyen bir kök örneği ile başlayan, bitkisel hammadde üretimi yapan bir firmanın kuruluşuna ve yeni ilaç adayı bileşiklerin ortaya çıkmasına önayak olan yaklaşık 20 yıllık bir yolculuğu sizlerle paylaşacağım.

DAK-6

Doç.Dr. Hakan Usta

Resume

Dr. Hakan Usta is an Associate Professor in the Department of Materials Science and Nanotechnology Engineering at Abdullah Gül University (AGU). He received his B.S. in Chemistry in 2004 from Bilkent University (Ankara, Turkey) and he obtained his Ph.D. in Chemistry from Northwestern University (Evanston, IL) under the supervision of Prof. Tobin J. Marks in 2008. He then joined Polyera Corporation, Illinois Science & Technology Park (Skokie, IL), where he worked as a Senior Research Scientist between 2008-2011 and as a Project Leader between 2011-2013. In 2013, he joined the faculty at AGU.

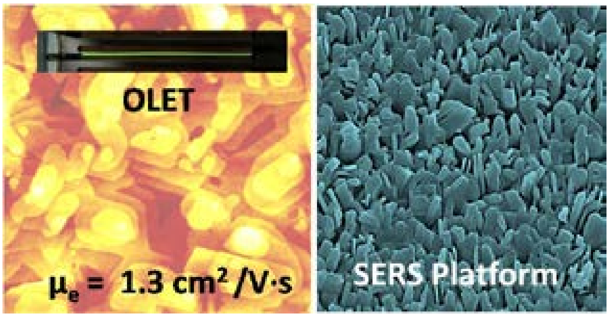
Dr. Usta received the 2014-BAGEP Distinguished Young Scientist Award, 2015-The Young Scientist of the Year (Science Heroes Association), and 2015-The Young Scientists Award (TÜBA-GEBİP) in the field of materials science and nanotechnology. Dr. Usta has published more than 35 research articles in high impact journals including JACS, Advanced Materials, Nature Materials, Chemistry of Materials, Organic Letters with a total international citation of more than 2000. He has 1 book chapter with Wiley, and holds 13 international patents. His current research interests include the development of high-performance functional organic materials for optoelectronic applications.

Doç.Dr. Hakan Usta

DESIGN AND DEVELOPMENT OF FUNCTIONAL ORGANIC SMALL MOLECULES AND POLYMERS FOR HIGH PERFORMANCE OPTOELECTRONICS

Assoc. Prof. Hakan Usta

Abdullah Gül University , Materials Science and Nanotechnology Engineering Department, Kayseri, Turkey



Since the discovery of high electrical conductivity with polyacetylene, π-conjugated functional organic materials have attracted significant scientific and technological attention over the last three decades as electro-active materials for the development of low-cost, printable and flexible optoelectronic devices. They are envisioned as essential components of next-generation optoelectronic devices such as flexible displays, low-cost solar panels, electronic papers, printable RFID tags, and sensors. These new technologies are expected to revolutionize the role of electronics in our daily lives and compliment current inorganic-based optoelectronic devices, which has greatly impacted our society starting from the second half of the 20th century. To this end, the theoretical design and synthetic tailoring of π-conjugated architectures have been very crucial to optimize the physicochemical and optoelectronic properties of organic materials for any particular application. In this study, we show that thin-films prepared by properly designed organic semiconductors can form favorable nanostructures, which can be used as Surface Enhanced Raman Spectroscopy (SERS) platforms and also in high-performance thin-film transistors (OTFTs) and light-emitting transistors (OLETs).[1-4]

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DAK-7

Prof.Dr. Vural Bütün

Resume

Dr. Bütün was born in Ordu/Turkey in 1968. He graduated from the Department of Chemistry Teaching, Ondokuz Mayıs University (OMU) in 1990. He received his MSc degree from the same university in 1993. He completed his PhD at the University of Sussex-UK in 1999 on "Synthesis, characterisation and evaluation of novel methacrylate based water-soluble block copolymers".

Dr. Bütün's first work experience was at a High School in Samsun as Chemistry Teacher for 6 months in 1990. He became a Research Assistant at the Chemistry Departments of OMU in 1991. He worked for both Ondokuz Mayıs University (1991-1994) and Eskisehir Osmangazi University (ESOGU, 1994-2000) as Research Assistant. He was also employed by the University of Sussex as a Post-Doctoral Research Fellow in 1999. He returned to Eskisehir Osmangazi University (ESOGU) at the end of 1999, just after finishing his PhD. He has worked at the Chemistry Department of ESOGU as an Assistant Professor (2000-2002) and became Associate Professor in 2002 and Professor in 2007. He has also visited the University of Sussex, Institute of Macromolecular Chemistry (Prague) and Hungarian Academy of Sciences as visiting research fellow (2000-2004). He has fulfilled various commission membership, such as the Faculty Board, Faculty Board of Directors, the Institute Board of Directors, Commission of Scientific Research Project Support, University Selected Board Member… Additionally, he was the Manager of Metallurgy Institute (2007-2009) and the Head of Chemistry Department (209-2010).

He is the Founder-Director of the Department of Polymer Science and Technology at Science Institute and Founder-Manager of Central Research Laboratory Application and Research Center of ESOGU (2012-…). Prof Bütün has published 60 scientific papers based on water-soluble polymers, surface-active polymers, self-assembly, cross-linked micelles, microgels, nanometal dispersions, nanofilms via LbL technology, schizophrenic copolymers, etc. He also published an international book chapter by writing his own works based on shell cross-linked micelles. His works were cited more than 2900. He is a reviewer in 15 international peer-reviewed journals and in 4 national peer-reviewed journals regularly.

Dr. V. Bütün became a member of the Turkish Academy of Sciences in 2009. He is also the owner of various scientific awards. Some of them are given below;

2004 Third World Academy of Sciences (TWAS) Science Encouragement Awards

2004 TUBA-GEBIP Outstanding Young Scientist Award

2004 TÜBİTAK Science Encouragement Award,

2005 PAGEV Plastic Technology Research Award

2006 Tunc Savascı Polymer Science and Technology Award

2008 Popular Science Award

Prof. V. Bütün is married and has two children. Currently, he continues to work in Chemistry Department of Eskisehir Osmangazi University. In these days, he is (i) The Dean of Faculty of Arts and Science, (ii) The Manager of Central Research Laboratory Apllication and Research Center, and (iii) The Head of the Department of Polymer Science and Technology at ESOGU.

Prof.Dr. Vural Bütün

'LEGO-GİBİ' POLİMERLER: NANO-ÖRGÜTLÜ, YETENEKLİ, ÇEVRE DUYARLI, AKILLI VE HATTA ŞİZOFRENLER

Vural Bütün

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Farklı tipte çözünebilir yüzey aktif blok kopolimerler ve türevlerinin sentezi, karakterizasyonu ve çözelti davranışlarının ortaya konması üzerine grubumuz tarafından yoğun çalışmalar yürütülmektedir [1]. Bu yüzey aktif polimerler ortam değişkenlerine cevap verebilen çevre duyarlı polimerler olarak da nitelendirilebilirler. Ortamın pH, sıcaklık ve elektrolit konsantrasyonuna bağlı olarak bloklardan birinin seçimli olarak (de)hidrasyonu sağlanarak ilginç davranışlar (misel, ters misel, çiçek misel, jelleşme, flocculation gibi) ortaya konanilmektedir. Ayrıca, "Layer by Layer" teknolojisi ile silika veya cam yüzeylerde nanofilmlerin oluşturulmasında bu polimerler ile yeni açılımlar/yaklaşımların kapısı aralanmıştır [2].

Bu çalışmalarımız, blok kopolimerlerin yeni bir sınıfının doğmasını da sağlanmıştır. Ş*izofren polimer* kavramı, suda çözünebilir diblok kopolimerler üzerine ilk kez 1998 yılında literatüre tarafımızdan kazandırılmış ve bugüne dek pek çok araştırma grubunun bu alana yönelmesine neden olunmuştur [3]. Sadece bir şizofren blok kopolimerlerin (i) farklı türde çapraz bağlı misellerin sentezinde [4], (ii) yüzeyi çere duyarlı latekslerin stabilizasyonunda, (iii) yeni çoklu-çevre duyarlı mikrojellerin stabilizasyonunda [5], (iv) nanometal dispersiyonların hazırlanmasında (yeni tip emülsiyon yapıcılar yada dispersantlar olarak) başarıyla kullanılabilecekleri ortaya konmuştur. İlgili kopolimerler, çapaz bağlı miseller, hidrojeller, mikrojeller, nanometal dispersiyonları ve diğer polimerik malzemeler; özellikle biyomedikal uygulamalarda (antibakteriyel dispersiyonlar, yeni tip ilaç taşıyıcılar ve kontrollü salım sistemleri gibi), sensör yapımında, kozmetikte, yeni tip çöktürücüler, jel yapıcılar ve toplayıcılar olarak pek çok alanda kullanım olanağı sağlama potansiyeli vardır.

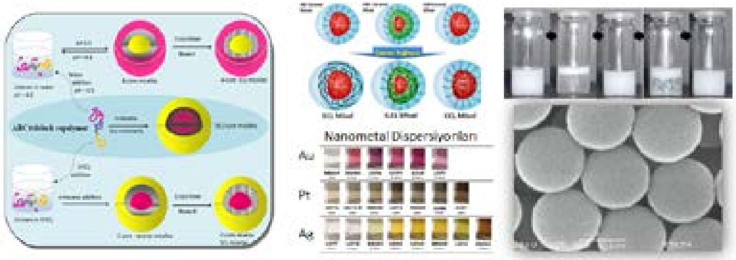

Figure 1: Yüzeyaktif pılimerlerden çeşitli nano-yapılı oluşumlar

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DAK-8

Doç.Dr. Önder Metin

Özgeçmiş

Eğitim: 2002 yılında Çukurova Üniversitesi, Kimya Bölümü'nden lisans derecesini ikincilikle aldı. 2004-2011 yılları arasında ÖYP kapsamında ODTÜ'de araştırma görevlisi olarak görev yaptı. ODTÜ Fen Bilimleri Enstitüsü Kimya Anabilim Dalı Anorganik kimya Bilim Dalında 2006 yılında yüksek lisansını ve 2010'da doktora çalışmalarını Prof. Dr. Saim Özkar danışmanlığında tamamladı. Doktora çalışmaları sırasında, 2009 yılında TÜBİTAK bursiyeri olarak Brown Üniversitesi, Kimya Bölümü (Rhode Island/ABD)'de 6 ay ve 2010 yılında Darmstadt Teknik Üniversitesi/Almanya'da 3 ay süreyle deneysel çalışmalar yaptı. 2011 yılında Atatürk Üniversitesi, Fen Fakültesi, Kimya Bölümünde yardımcı doçent olarak göreve başladı. 2012-2013 yılları arasında Brown Üniversitesi, Kimya Bölümü'nde doktora sonrası araştırmacı olarak çalıştı. 2013 yılında Kimya Bilim alanında Doçent ünvanını aldı.

Ödüller: Dr. Önder Metin; 2011 yılında doktora tez çalışmaları nedeniyle ODTÜ Öğretim Elemanları Derneği tarafından verilen "*9. Serhat Özyar Yılın Genç Bilim İnsanı*" ödülünü, 2013 yılında ODTÜ Prof. Dr. Mustafa N. Parlar Eğitim ve Araştırma Vakfı tarafından "Araştırma Teşvik Ödülü"nü, 2014 yılında Türkiye Bilimler Akademisi "Üstün Başarılı Genç Bilim İnsanı" (TÜBA-GEBİP) ödülünü ve 2015 yılında FABED "Üstün Başarılı Genç Bilim İnsanı Ödülünü almıştır. 2013 yılında TÜBİTAK-Lindau Bilimsel Etkinliklere Katılma Desteği Programı kapsamında "63. Lindau Nobel Ödüllü Bilim İnsanları Toplantısı"na katılmak üzere Türkiye'den seçilen altı kişilik ekipte de yer almıştır. Almış olduğu bu ulusal ödüllere ilaveten Atatürk Üniversitesi Rektörlüğünün her yıl düzenlediği Bilimsel Teşvik Ödülleri kapsamında 2012-2015 yılları arasında "Fen Bilimleri Alanı Etkin Makale Dalında Birincilik Ödülü"nü 4 defa üst üste almıştır. Aynı ödül programı kapsamında 2016 yılında Atıf Dalında birincilik ödülü almıştır.

Akademik Faaliyetler: Doç. Dr. Önder Metin'in bir adet ABD patenti, Uluslararası Atıf Endeksleri kapsamındaki dergilerde basılmış 52 adet makalesi olup; bu makalelere 2100'ün üzerinde atıf yapılmıştır ve h-indeksi 24'dür. Uluslararası konferanslarda sunulmuş 23 ve ulusal konferanslarda sunulmuş 27 adet bildirisi vardır. Doç.Dr. Önder Metin 2013 yılından itibaren TÜBİTAK tarafından yayınlanan "Turkish Journal of Chemistry" dergisinde Editörlük görevi yapmaktadır. ACS, RSC, Wiley, Springer, Elsevier ve diğer bilimsel dergi yayın evlerinin saygın dergilerine yılda ortalama 35'in üzerinde hakemlik yapmaktadır. Doç.Dr. Önder Metin Türk Kataliz Derneği denetleme kurulu üyesidir. Doğu Anadou İleri Teknoloji Araştırma ve Uygulama Merkezi (DAYTAM)'da Müdür Yard. Görevini yürütmektedir.

Evli ve bir çocuk sahibi olan Doç. Dr. Önder Metin halen Atatürk Üniversitesi, Fen Fakültesi, Kimya Bölümü'nde araştırma grubu ile alaşım ve çekirdek-kabuk yapısında nanopartiküllerin sentezi ve organik tepkimelerde kataliz uygulamaları, hidrojen depolama, elektrokataliz ve lityum-hava bataryaları kapsamında çalışmalarını sürdürmektedir.

Doç.Dr. Önder Metin

NANOCATALYSTS IN A WIDE-RANGE APPLICATION SPECTRUM: FROM ORGANIC SYNTHESIS TO ENERGY STORAGE

Doç. Dr. Önder Metin

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Transition metal nanoparticles (TMNPs) are widely used in a variety of fields owing to their distinct physical and chemical properties compared to those of bulk metals. TMNPs have rather large surface area and catalytically more active surface atoms than bulk metals, which is one of the most important reasons behind their widely usage. Therefore, they have been preferentially used as catalysts in various catalytic reactions and show advantageous catalytic properties compared to those of homogeneous and heterogeneous analogues. Therefore, the new term, "Nanocatalysis", is raised and growing fast. Up to date, nanoparticles of all catalytically active transition metals have been synthesized by using different methods and their catalysis were studied in various reactions. However, the interest in the use of bimetallic nanoparticles instead of monometallic ones has been increased daily because the bimetallic TMNPs either in alloy or core-shell form show higher activity, selectivity and stability compared to the monometallic counterparts owing to the "Synergistic" effects formed between two distinct metal atoms. In particular, economical catalysts could be developed by the preparation of bimetallic alloy or core-shell nanoparticles of noble metals with a non-noble metal, which is considered to be very advantageous for the catalytic reactions using noble metals as catalyst. However, the composition control over the bimetallic nanoparticles is very important for the design of most efficient catalysts in different catalytic applications.

In this invited talk, after giving a brief introduction to the Nanocatalysis, I am going to talk about our recent studies on the synthesis of monodisperse bimetallic nanoparticles, their structural characterization and their wide-range catalytic applications comprising the organic, inorganic and electrochemistry. Among the bimetallic nanocatalysts, commercially available carbon or reduced graphene oxide supported **M**-Pd (**M:** Fe, Co, Ni, Cu, Ag, Au) alloy, **M**@Pd (**M:** Ni, Ag and Au) core@shell and **M**-Pt (**M:** Co, Ni, Cu) alloy nanoparticles would be mentioned. As the catalytic reactions; the transfer hydrogenations using AB as the hydrogen source, the C-C cross-coupling reactions, the reductive amination, and the high-performance electrocatalysts for the rechargeable Li-air batteries will be covered. More importantly, our attempt towards to commercialization of rGO-$Ni_{30}Pd_{70}$ nanocatalysts will be mentioned.

* *The most of the studies presented here were conducted in the context of TÜBİTAK 113Z276 project.*

Keywords: Nanocatalysis; Transition metal nanoparticles; Bimetallic nanoparticles; Alloy nanoparticles; Core@shell nanoparticles; Catalytic applications.

DAK-9

Prof.Dr. Ümit Demir

Özgeçmiş

Erzurum Olur ilçesi Taşlıköy'de 1960 yılında doğdu.

İlk, Orta ve Lise eğitimini Erzurum'da tamamladıktan sonra 1980 yılında Atatürk Üniversitesi Fen Edebiyat Fakültesi Kimya Bölümünden mezun oldu. 1983-1986 yılları arasında Trabzon Araklı ilçesi Araklı Lisesinde Kimya Öğretmenliği yaptıktan sonra, 1987 yılında Atatürk Üniversitesi Fen Edebiyat Fakültesi Kimya Bölümü Analitik Kimya Anabilim Dalına asistan olarak atandı.

1989 yılında Atatürk Üniversitesi Fen Bilimler Enstitüsü'nde yüksek lisans derecesi aldıktan sonra YÖK bursu ile Amerika Birleşik Devletlerinde doktora yapmak üzere görevlendirildi. Alabama, Auburn Üniversitesi'nde doktora çalışmaları süresince Merriwether Fellowship ödülüne aday gösterilen ve 4 yıl teaching ve 1 yıl research asistanlık yapan Sayın Demir 1996 yılında Kimya Doktoru unvanını aldı.

Atatürk Üniversitesi Fen Edebiyat Fakültesi Kimya Bölümünde 1996 yılında yardımcı doçent, 1997 yılında doçent ve 2002 yılında profesör unvanı aldı.

2000-2003 yılları arasında Atatürk Üniversitesi Fen Bilimleri Enstitüsü Müdürlüğü, 2003-2008 yılları arasında ise Fen Edebiyat Fakültesi Dekanlığı görevlerini yürüttü. 2004-2009 yılları arasında TÜBİTAK TBAG Yürütme Kurulu Komite Üyeliği yaptı.

Analitik Kimya, Elektrokimya ve Nanobilim ve Nanoteknoloji alanlarında çok yüksek atıf indeksli dergilerde yayınlanmış 33 makaleye, danışmanlığında tamamlanmış çok sayıda doktora ve yüksek lisans tezlerine ve yürütücülüğünde tamamlanmış ulusal ve uluslararası düzeyde projelere sahiptir. Çok sayıda ulusal ve uluslararası dergilerde hakemlik, editörlük ve yine ulusal ve uluslararası projelerde hakemlik ve izleyicilik yapmıştır.

Halen Atatürk Üniversitesi Fen Fakültesi Kimya Bölümü Analitik Kimya Anabilim Dalı Başkanlığını yürütmekte olup, evli ve iki çocuk babasıdır.

Prof.Dr. Ümit Demir

ELECTROCHEMICAL SYNTHESIS AND ELECTROCHEMICAL APPLICATIONS OF REDUCED GRAPHENE OXIDE-METAL/ METAL OXIDE NANOCOMPOSITES

Ümit Demir

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Graphene-based materials show great potential for wide range of applications in energy storage, solar cells, heterogeneous catalysis, sensors etc. Therefore, the researchers have been studied on the new methods that improve the chemical/physical properties of graphene and make it more functional for various applications. Incorporation of different materials into the graphene is a promising way to synthesize hybrid composites with novel properties [1]. Especially, the hybrid composites that are formed by the anchoring of metal or metal oxide with graphene or GO have been the most studied research topic in the recent years. However, those composites were generally prepared by chemical methods and in the form of three-dimensional nanoparticles.

In this work, we have presented a novel and simple strategy to fabricate layered reduced graphene oxide (ERGO)-Metal (Cu, Pd, Zn, Ni) nanocomposites by using electrochemical reduction of GO and underpotential deposition (UPD) of Cu, Pd, Zn and Ni monolayers. The presented UPD-based electrochemical method [2] which provides two-dimensional atomic-layer growth of metal layers has not been reported yet in the literature. Here, a single atomic layer of metals has been deposited electrochemically on the surface of Au or indium tin oxide (ITO) electrode by UPD technique. Then GO has been reduced electrochemically on top of these metallic monolayers in order to form one layer of Metal-ERGO nanocomposites [3]. The thicker $(\text{-Me-ERGO-})_n$ sandwich-structured composites can be electrodeposited by repeating the sequential UPD and electrochemical reduction of GO. The Metal Oxide-ERGO nanocomposites were obtained by the oxidation of deposited metallic monolayer in the presence of dissolved O_2 [4].

Our results indicated that the ERGO-based metal/metal oxide nanocomposites could be prepared directly on the electrode surface without the need of additional processes for the electroanalytical applications. Moreover, composites that have the desired composition, structure and properties could be easily prepared by changing the electrochemical parameters. X-ray diffraction (XRD), Raman Spectroscopy, X-photoelectron spectroscopy (XPS), energy-dispersive X-ray spectroscopy (EDS), scanning tunneling microscopy (STM) and scanning electron microscopy (SEM) techniques were used to characterize the ERGO-based metal composites. Electrochemical and photocurrent measurements revealed that those composites are promising candidates for the catalysis of methanol and ethanol. These nanocomposites were also applied in biosensing applications, particularly for the detection of dopamine, ascorbic acid and H_2O_2.

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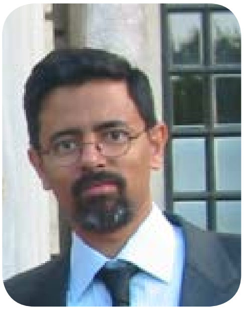
DAK-10

Doç.Dr. Amitav Sanyal



Resume

Amitav Sanyal obtained his undergraduate degree from the Indian Institute of Technology at Kanpur, India. He completed his Ph.D. in 2001 from Boston University (USA) on asymmetric organic synthesis. During post-doctoral work at University of Massachusetts at Amherst (USA), he worked in the area of renewable polymeric coatings and fabrication of polymer-nanoparticle composite materials using molecular recognition. In 2004, he joined the Chemistry Department at Bogazici University, Istanbul, Turkey. Currently he is an associate professor at Bogazici University. His research focuses on the utilization of organic chemistry to develop novel polymeric coatings, hydrogels and nanofibers for biomolecular recognition for sensing, as well as fabrication of metal nanoparticle based imaging and drug delivery systems. Dr. Sanyal has around 70 publications in journals of high international repute, along with 5 invited book chapter contributions. In 2008, Dr. Sanyal was one of the recipients of the Young Investigator Award from the Turkish Academy of Sciences (TÜBA). In 2011, Dr. Sanyal received the Young Investigator Award administered by TÜBİTAK.

Doç.Dr. Amitav Sanyal

SMALL SOLUTIONS FOR BIG PROBLEMS: POLYMERIC NANOMATERIALS IN LIFE SCIENCES

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Polymeric nanomaterials seem to provide key solutions to many of the current challenges in health sciences. The unique properties of these nanomaterials that arise from their small size can be harnessed to improve diagnosis as well as provide effective treatment of several diseases. Soft polymeric materials alone or in combination with various inorganic nanomaterials can be engineered to generate effective sensing and delivery platforms. Depending on the particular application, these soft polymeric materials can be utilized as functional nano objects in solution [1], or can be employed to fabricate functional materials such as nanofibers [2] and nanogels. Furthermore, nanometer thick polymeric coatings on planar or curved inorganic surfaces can render them biocompatible and functional [3]. Increasing demand of these polymeric materials has necessitated novel methods of synthesis and fabrication [4]. Design at the molecular level allows one to tailor the characteristics of these polymeric materials for specific applications. While an application such as implant coating may demand nanomaterials that are extremely robust in the biological milieu, others such as drug delivery may require materials that disintegrate and easily clear from the body upon accomplishing their job. Likewise, robust nano-structured bulk materials may provide ideal platforms for diagnostics, whereas slowly dissolving nanomaterials may be suitable candidates for release of therapeutics. Intelligent polymeric nanomaterials engineered to allow specific and/or 'on demand' stimulation can be utilized to control delivery of therapeutically relevant peptides and proteins. Over the past few years we have designed novel polymeric nanomaterials and nano-composites for use in diagnostics and delivery. The presentation will summarize various polymeric nanomaterials that have been designed for potential applications in health sciences.

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DAK-11

Prof.Dr. Şule Erten Ela

Özgeçmiş

Prof. Dr. Şule Erten Ela (Enerji Anabilim Dalı, Ege Üniversitesi Güneş Enerjisi Enstitüsü)

2004 yılında Ege Üniversitesi Güneş Enerjisi Enstitüsü'nde Enerji alanında doktora çalışmalarını tamamladı. Şule Erten Ela, 2005 yılında Güneş Enerjisi Enstitüsü'nde Enerji Anabilim Dalında Yrd. Doç. olarak, yine aynı birimde 2009 yılında Doçent ve 2015 yılında Profesör olarak atandı. Doktora çalışmaları sırası ve sonrasında, Johannes Kepler Üniversitesi, Linz Institute of Solar Cells, Avusturya'da 2003, 2004, 2007 tarihlerinde Organik Güneş Hücreleri (Organic Solar Cells), Alan Etkili Organik Transistörler (Organic Field Effect

Transistors, OFET) ve Işık Yayan Organik Diyotlar (Organic Light Emitting Diodes, OLED) üzerine çalıştı. 2006 ve 2007 yıllarında Boya Duyarlı Güneş Hücreleri (Dye Sensitized Solar Cell) üzerine Lozan-İsviçre Ecole Polytechnique Federal de Lausanne' da araştırmalarına devam etti. 2009 yılında, Katı Hal Boya Duyarlı Güneş Hücreleri (Solid State Dye Sensitized Solar Cells) üzerine Bayreuth University Bayreuth-Almanya'da çalıştı. 2010 yılında Madrid-İspanya Complutence Üniversitesi'nde Fulleren Kimyası ve Hacim Heteroeklem Güneş Hücreleri (Bulk Heterojunction Solar Cells) üzerine çalıştı. 2011 yılında Almanya'nın önemli bilim ödülü olan Alexander von Humboldt ödülünü aldı. 2011-2014 yılları arası Friedrich Alexander Üniversitesi Erlangen-Almanya'da, yeni elektron akseptör fulleren malzemelerinin geliştirilmesi, grafen oksitler ve Heteroeklem Güneş Hücreleri, Boya Duyarlı Elektrolitli Güneş Hücreleri ve Esnek Organik Güneş Hücreleri ileri düzey araştırmaları üzerine çalışmıştır. Bu alandaki çalışmaları 2015 yılında Almanya'da Materials for Electronics and Energy Technology I-MEET, Friedrich Alexander Üniversitesi ile Perovskit Güneş Hücrelerinin ileri düzey araştırma çalışmaları ile devam etmiştir. Şule Erten Ela, Perovskit Güneş Hücreleri, Boya Duyarlı Organik Güneş Hücreleri (DSSC), Katı Hal Boya Duyarlı Güneş Hücreleri (SDSC), Heteroeklem Güneş Hücreleri (BHJ, Inverted-BHJ), Esnek Boya Duyarlı Güneş Hücreleri, Alan Etkili Organik Transistörler (OFET), Organik Işık Yayan Diyotlar (OLED), Li-ion Piller üzerine uzmanlığı ve tüm bu araştıma konuları üzerine üst düzey yayınları bulunmaktadır. Şule Erten Ela'nın ayrıca organik ve metal oksit sentez, fulleren sentezleri, fotokataliz, fotodegradasyon, enerji sistemleri üzerine de uzmanlığı ve araştırmaları bulunmaktadır. Almanya'nın Alexander von Humboldt Ödülü'nün yanısıra 2013 yılında TÜBA-GEBİP, Türkiye Bilimler Akademisi Üstün Başarılı Genç Bilim İnsanı Ödülü'nü aldı. Şule Erten Ela, 2013 yılında Almanya Alexander von Humboldt Kurumu'nun Başarılı Türk Bilim İnsanı ve Testimoniali seçildi. 2016 yılında halen bu konudaki başarısı AvH kurumunun web sitesinde yayınlanmaktadır. Şule Erten Ela, 2014 yılında UNESCO - L'ORÉAL Genç Bilim Kadınları Ödülü'nü aldı. 2015 yılında Bilim Akademisi Üstün Başarılı Genç Bilim İnsanı Ödülü'nü (BAGEP) aldı. Şule Erten Ela aynı zamanda Genç Bilim Akademisi üyesidir. Şule Erten Ela'nın Alan Etkili Organik Transistörler (OFET) üzerine patenti, 60 üzeri üst düzey SCI bilimsel yayınları, 45 uluslararası ve ulusal projeleri, 150 üzeri uluslararası ve ulusal bildiri sunumları, pek çok Editörlük ve bilimsel dergilerde hakemlikleri ve bu konularda çok fazla üstün başarı ödülleri bulunmakta olup, ayrıca 1250 üzerinde başkaları tarafından atıfı bulunmaktadır. Şule Erten Ela 2016 yılından itibaren Güneş Enerjisi Enstitüsü Enerji Anabilim Dalı Başkanlığı ve Enstitü Kurulu Üyeliğini yürütmektedir. Şule Erten Ela halen Ege Üniversitesi Güneş Enerjisi Enstitüsü Enerji Anabilim Dalında Profesör öğretim üyesi olarak çalışmaktadır.

Prof.Dr. Şule Erten Ela

ALTERNATIVE MATERIALS FOR CATALYZES USED IN DYE SENSITIZED SOLAR CELLS

Şule Erten Ela

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Dye sensitized solar cells (DSSCs) have attracted considerable attention because of their low costs and easy fabrication processes for the conversion of sunlight into electricity [1,2]. Photovoltaics based on semiconductor materials provide an attractive solutions for solar energy conversion. Dye sensitized solar cells are successful alternatives compare to Si based photovoltaic system. A typical DSSC uses TiO_2 coated transparent conductive oxide anode sensitized with a suitable organic dye [1]. Organic dyes comprising conjugated π-electron systems are commonly used in electronic and optoelectronic devices such as organic field effect transistors, solar cells and organic light emitting diodes [1]. In order to improve the performance of DSSCs, extensive research efforts include nanocrystalline semiconductors, sensitizers, electrolytes and counter electrodes have been devoted to improve the performance of DSSCs. Generally, platinum counter electrode is used in DSSC to transport the electron from the external circuit to the redox electrolyte for reduction of I_3^-/I^- to provide sufficient I^- species which used to regenerate of the oxidized dye molecules. However, platinum is very expensive and increase the DSSC cost. Carbon nanotubes and their composites with conducting polymers are good alternative as counter electrodes for low production cost of DSSCs. The incorporation of conducting polymers in CNT structure is expected to lead to composites with significantly different physical-chemical properties than the original materials [3, 4]. This study reports a novel, cost-effective, and simple preparation of MWCNT composites with conducting polymers. Polymer based multi-walled carbon nanotube (MWCNT) composites were successfully prepared. Morphological characterizations of composites were determined using scanning electron microscopy (SEM), which showed that conducting polymers were coated on the surface of CNTs. The surface properties of the Carbon Nanotube (CNT) composites were also determined by using Infrared Spectra (FT-IR), X-ray Photon Spectra (XPS), and Scanning Electron Microscopy-Energy Dispersive X-ray Spectra (SEM-EDX) analysis. X-ray photon spectra results confirmed the formation of the composites. Composites of MWCNT were used in dye-sensitized solar cells (DSSCs) as counter electrodes. In this study, all different types of solar cell technologies were evaluated for further efficiencies.

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DAK-12

Doç.Dr. Filiz Kuralay

Özgeçmiş

Filiz Kuralay Ordu'da doğdu. 2001'de Hacettepe Üniversitesi Kimya Bölümü'nden lisans derecesini aldı. Yüksek lisansını ve doktorasını yine aynı bölümde sırasıyla 2003 ve 2009 yıllarında tamamladı. Kaliforniya Üniversitesi, San Diego (UCSD)'da yaklasık 3 yıl süren doktora sonrası araştırmalarından sonra yurda geri döndü. Dr. Kuralay 2013 yılından beri Ordu Üniversitesi Fen Edebiyat Fakültesi Kimya Bölümünde Doç. Dr. olarak görev yapmaktadır. Çalışma alanları nanoteknoloji, nano/mikromotorlar, biyosensörler, biyoyakıt hücreleri, kontrollü ilaç salımı ve iletken polimerlerdir.

Dr. Filiz Kuralay'ın 50'nin üstünde yayını olup, 10 adet kitap bölümü yazarlığı bulunmaktadır. Makalelerine 1000 civarı atıf yapılmıştır. Ayrıca 2 kitap editörlüğüne devam etmektedir. Dr. Kuralay 20'ye yakın ulusal ve uluslararası projede (TÜBİTAK, Amerikan Sağlık, Savunma ve Enerji Bakanlıkları, Procter & Gamble, vb.) yürütücü ve araştırmacı olarak görev yapmıştır ve yapmaktadır. 25 davetli konuşma ve 61 tane bilimsel toplantı sunumu bulunmaktadır. Feyzi Akkaya Bilimsel Etkinlikleri Destekleme Fonu (FABED) Eser Tümen Araştırma Ödülü-2013, Ordu Üniversitesi Başarı Ödülü-2014, UNESCO-L'ORÉAL Bilim Kadını Ödülü-2015 ve Türkiye Bilimler Akademisi Üstün Yetenekli Genç Bilim İnsanı Ödülü (TÜBA-GEBİP)-2015 ve Bilim Kahramanları Derneği Genç Bilim İnsanı Ödülü-2015 sahibidir. 2015 yılında Türkiye Bilimler Akademisine Asosye üye olarak seçilmiştir.

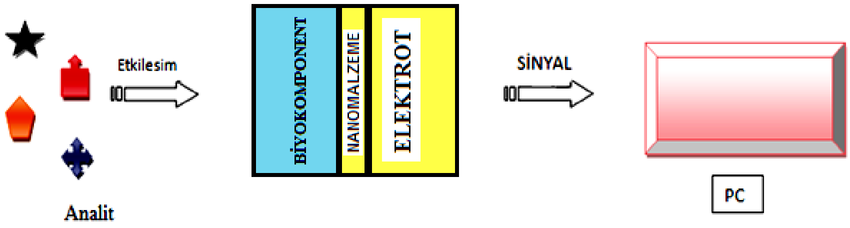
Doç.Dr. Filiz Kuralay

ELEKTROKİMYASAL NANOBİYOSENSÖRLER VE UYGULAMALARI

Filiz Kuralay

Ordu Üniversitesi, Fen Edebiyat Fakültesi, Kimya Bölümü

Günümüzde hızlı, güvenilir, duyarlı, seçici ve ekonomik analiz sistemlerinin tasarlanması ve kullanımı oldukça önem kazanmaktadır. Bu bağlamda biyosensörler çoğu zaman alıcı klasik analiz sistemine göre üstün avantajlar sağlar. Bir biyosensör hedef analitle spesifik olarak etkileşime giren biyolojik olarak aktif bir tanıyıcı kısım ile bu etkileşim sonucunu ölçülebilen bir sinyale dönüştürebilen bir çeviriciden oluşan analitik bir aygıttır. Biyosensör çeşitleri arasında elektrokimyasal sensörler küçük boyutlarda, portatif ve oldukça ekonomik olmaları nedeniyle en çok kullanılan biyosensör çeşitlerinden biri olmuştur. Kompleks ortamlarda kolaylıkla kullanılabilmeleri bu biyosensör türünü oldukça cazip kılmaktadır [1-3]. Elektrokimyasal biyosensörler, biyoetkileşim sürecinde elektron gibi elektrokimyasal türlerin harcanıp oluşurken ortaya çıkan elektroaktif sinyalin ölçüldüğü biyosensör türleridir. Oluşan bu elektrokimyasal sinyal yine elektrokimyasal dedektörler tarafından ölçülür (Şekil 1). Son yıllarda özellikle nanoteknoloji alanındaki yeniliklerin elektrokimyasal biyosensör teknolojisine dahil edilmesiyle ortaya çıkan çalışmalar ilgi çekmektedir. Nanomalzemelerin elektrot yüzeyine modifikasyonu ile oluşturulan elektrokimyasal nanobiyosensörler oldukça seçici ve duyarlı analiz sistemleri oluşturmaktadır. Bu biyosensörler tıp, biyoteknoloji, tarım, gıda, çevre ve savunma gibi birçok alanda önemli rol oynamaktadır. Bu konuşmada elektrokimyasal nanobiyosensörler ve özellikle biyomedikal alandaki uygulamaları üzerine ayrıntılı olarak durulacaktır.



Şekil 1. Bir elektrokimyasal nanobiyosensörün genel çalışma prensibi.

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DAK-13

Prof.Dr. Nazan Demir

Özgeçmiş

Prof. Dr. Nazan Demir 1964 yılında Tarsus da doğdu. İlk ve orta öğretimini Tarsus' da tamamladıktan sonra, 1981 yılında Atatürk Üniversitesi Kimya bölümünü kazanmıştır. 1985 yılında lisans eğitimi tamamladıktan sonra aynı üniversitede araştırma görevlisi olarak çalışmaya başlamıştır. Aynı üniversitede 1986-1988 yılları arasında yüksek lisans, 1988-1991 yılları arasında biyokimya alanında doktora eğitimini tamamlamıştır. Atatürk Üniversitesi Kimya Bölümünde 1992-1998 yılları arasında yardımcı doçent, 1998-2004 yılları arasında doçent ve 2004-2011 yılları arasında profesör olarak çalışmıştır.

2011 yılı Eylül ayından itibaren çalışmalarına Muğla Sıtkı Koçman Üniversitesi Kimya Bölümünde devam etmektedir. 2012-2013 yılları arasında Moleküler Biyoloji ve Genetik Bölümü'nün kurucu bölüm başkanlığı ve 2013-2015 yılları arasında Araştırma Laboratuvarları Merkez Müdürlüğü görevinde bulunmuştur. Halen 19 Aralık 2013 tarihinde Prof. Dr. Nazan Demir öncülüğünde kurulan Kozmetik Ürünler Uygulama ve Araştırma Merkezi Müdürlüğü görevini sürmektedir. Bu merkez çalışmaları kapsamında 16 adet aromatik yağ üretimi, 4 adet bitkisel çay üretimi ve 7 adet kozmetik ürün üretimi için gerekli izinler alınmış olup "Naz Demir" markası ile Muğla Sıtkı Koçman Üniversitesi Döner Sermaye İşletme Müdürlüğü tarafından satışa sunulmuştur. Bu özelliği ile kurulan merkez Türkiye de ilk ve tek olma özelliğine sahiptir. Bu merkezde Prof. Dr. Nazan Demir tarafından birçok yeni kozmetik formülasyon geliştirilmiştir ve bu ürünler için patent başvuruları yapılmıştır.

Prof. Dr. Nazan Demir bu güne kadar Biyokimya, Moleküler Biyoloji ve Genetik, Kozmetik Kimyası, Fitokimya, Enzim Kinetiği, Farmasötik Kimya, Kanser Moleküler Biyolojisi, Farmasötik Biyoteknoloji, Biyoteknoloji, Klinik Enzimoloji alanlarında çalışmalar yürütmüştür. Sayın Prof. Dr. Nazan Demir' in 30 yıllık akademik hayatı boyunca ulusal ve uluslararası dergilerde 90 adet makalesi yayınlanmıştır. Ulusal ve uluslararası kongrelerde ise 118 tane bildiri sunmuştur. 28 adet projede görev almıştır. Genel Kimya ve Biyokimya alanında dilimize çevrilen çok önemli kaynak olarak gösterilen Chang Genel Kimya ve Lehninger'in Biyokimyası kitaplarında çeviri kurullarında yer almıştır. Kozmetik alanında başvuru kitabı niteliğinde olan "Kozmetik Ürünlerin Analizi" isimli kitabın ise çeviri editörlüğünü yapmıştır. Bugüne kadar danışmanlığında 22 adet lisansüstü tez çalışması bitirilmiştir. Halen 3 adet lisansüstü danışmanlığı devam etmektedir. Ayrıca Sayın Prof. Dr. Nazan Demir edebiyat ile de çok yakından ilgilenmektedir. Henüz yayınlanmamış şiirleri, öyküleri ve denemeleri vardır. Kısa zaman içinde ise kaleme aldığı bir romanı yayınlanacaktır.

Kendisini tam bir doğa tutkunu ve bilgi yolcusu olarak tanımlayan Prof. Dr. Nazan Demir evli ve üç erkek çocuk annesidir.

Prof.Dr. Nazan Demir

KOZMETİK SEKTÖRÜNDE ÜNİVERSİTE SANAYİ İŞBİRLİĞİ VE MARKA OLUŞTURMA

Prof. Dr. Nazan DEMİR

Kimya sanayisi, plastikten kozmetiğe, ilaçtan boyaya, üretiminin yaklaşık %30'u tüketiciye doğrudan ulaşan bitmiş ürünler, %70'i ise diğer sektörlere (tekstil, elektrikli eşya, metal, madeni ürünler, inşaat, otomotiv, kâğıt, hizmet sektörü) hammadde sağlayan ürünlerden oluşan merkezi bir endüstri koludur. Bu nedenle kimya sanayi, hem insanların gündelik yaşamları açısından hem de diğer sektörler açısından ayrıcalıklı bir yere sahiptir. Kimya sanayisi ekolojik dengelerin korunması ve insan yaşamının kalitesi açısından tartışmasız bir numaralı alandır.

Bir markayı planlamak, tasarlamak ve tescil ettirmek güzel, hoş bir süreç. Ama ne önemi var? Kişi neden böyle bir süreci yaşamak istesin? Bir şeyler üretmek ve satmak istiyorsanız ürün etiketi üzerine yazacağınız, okuduklarında insanların sizi hatırlayacağı, insanların birbirlerine tavsiye ederken sizi hatırlatacak bir isme ihtiyacınız var. İşte marka günümüzde bunu karşılıyor. Ürünün ve işlevinin birleşim kümesi oluyor. Duyduğunuzda veya gördüğünüzde zihninizde ürün ve ne işe yaradığı canlanıyor. Markaları, firmaların yurt içi ve yurt dışı pazarlarda güçlü ve devamlı olabilmelerini sağlıyor. Pazarda sağlam bir yer edinmenin en önemli püf noktası markadır. Markayı oluştururken en önemli nitelik markanın kaliteli olması ve bu kalitenin devamlılığını korumasıdır. Sonuç olarak da ulaşılmak istenen hedef kitlenin de güvenini oluştur-makla birlikte marka seçiciliği temsil etmektedir.

SANAYİ İLE NASIL İŞBİRLİĞİ YAPABİLİRİZ?

Biz mi onlara gidelim yoksa onlar mı bize gelsin?

Aslında ikisi de olur. Biz gidip ürünlerimizi, üretim şeklini, maliyetini, kar marjını anlatsak ve sanayiciyi ikna etsek de olur. Onlar bize gelip şu konuda bir araştırmaya, bir ürüne ihtiyacım var benim için bunu yapabilir misin? Diyerek gelip bize başvursa da olur. Ama ikisi de çok nadir oluyor. Olduğunda da pek başarıya ulaşmıyor. Bana göre yapılması gereken bir diğer şey ise kozmetik ile ilgili eğitim kurumlarının oluşturulması. Örneğin Kozmetik Uzmanları yetiştirecek fakültelerin açılması. **İnsan kaynağı yetiştikten sonra geriye kalanının daha kolay olacağını düşünüyorum. Güzel Sanatlar Bölümü ve Güzel Sanatlar Fakülteleri örneklerinde olduğu gibi.** Bu bölüm ve fakülteler üniversitelerde ilk kurulduklarında garip gelmişti ama günümüzde Türk dizi ve sinema sektörü dünya çapında iş yapar hale geldi.

Kozmetik Fakülteleri veya Bölümleri kurulduktan ve Kozmetik Alanı Devlet tarafından teşvik edildikten yaklaşık 20 yıl kadar sonra Türkiye'nin Kozmetik Sektörünün dünyada liderler arasına gireceğine inanıyorum.

DAK-14

Doç.Dr. Fabienne Dumoulin

Resume

Yrd. Doç. Dr. Fabienne Dumoulin graduated in Biochemistry and completed her Master and PhD theses in Organic Chemistry at the University Claude Bernard Lyon 1, France, where she earned in 2002 a doctoral thesis on the self-assemblies of neoglycolipids. After a post-doc in Pisa, Italy, she joined the Chemistry Department of Gebze Technical University in 2005, where she got interested in the chemistry, properties and applications of tetrapyrrolic derivatives, mainly phthalocyanines.

Her two major research topics are the development of new synthetic methods towards highly asymmetrically substituted phthalocyanines, and the design and synthesis of photosensitisers for photodynamic therapy, for which she established severak international collaborations with teams in UK, Poland, Malaysia, France or again Austria. This led to the publication of 55 + research articles, three book chapters and the completion of 4 PhD and 5 Master theses.

She has been awarded the GEBİP - Young Scientist Outstanding Achievement Award from the Turkish Academy of Sciences and the BAGEP - Young Young Scientists Award from the Bilim Akademisi. She chaired the first GTÜ-photodynamic day last year and is currently officer of the executive committee of the European Society for Photobiology, associate editor for the RSC Advances journal, and member of the Turkish mirror group of the European Technology Platform on Nanomedicine.

Doç.Dr. Fabienne Dumoulin

DESIGN & SYNTHETIC STRATEGIES OF PHOTOSENSITISING TETRAPYRROLIC DERIVATIVES

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Photodynamic therapy is based on the combination of three partners: *light* activating a *photosensitiser* to convert *molecular oxygen* into its highly reactive singlet form. This therapeutic modality used as a cancer treatment offers several advantages over chemotherapy, radiotherapy and surgery, as it has no side effects such as hair loss, nausea and other incapacitating drawbacks. Chemists are strongly involved in the development of new photosensitisers with better efficiencies and selectivities.

Conveniently metalated and / or substituted porphyrins and phthalocyanines are tetrapyrrolic derivatives which can exhibit suitable properties for photodynamic therapy. In addition to the design of new substitution patterns ensuring their water-solubility necessary for biocompatibility issues, we developed different strategies to:

- combine the photodynamic effect with an antivascular effect [1]
- promote their excitation at near-infra-red wavelengths [2]
- insert them into nanoparticles to benefit from the Enhanced and Permeation Retention effect [3]
- target tumours which over express specific receptors, by introducing carbohydrates [4] or vitamins [5]
- investigate the recent interest of more hydrophobic substitution pattern [6]
- optimize the singlet oxygen generation thanks to the heavy atom effect [7]
- limit the activity to the tumoral tissues by tumor-site activation strategies based on the difference of tumoral tissues compared to healthy ones,

All these works are concomitant of more fundamental studies [8] allowing systematic structure-properties and structure-activities relationships investigations.

These works are and have been funded by several TUBITAK projects (106T376, 109T523, 111M386, 111T031, 112T670, 113Z595 and 214Z099) and the Turkish Academy of Sciences (TÜBA-GEBIP 2015).

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DAK-15

Doç. Dr. Tamer Uyar

Özgeçmiş

Tamer UYAR, ODTÜ Kimya Eğitim ve Kimya (Çift Anadal) bölümlerinden 1998 yılında mezun oldu ve ODTÜ Kimya bölümünde yüksek lisans eğitimini 2000 yılında tamamladı. Tamer UYAR eğitimine A.B.D.'de devam ederek 2002 yılında University of Cincinnati, Materials Science and Engineering bölümünden Master derecesi ve 2005 yılında North Carolina State University, Fiber and Polymer Science bölümünden Doktora derecesi aldı. Doktora sonrası araştırmasını Case Western Reserve University, Macromolecular Science and Engineering bölümde 2005-2006 yılları arasında tamamladı. Tamer UYAR, 2006-2008 yılları arasında Danimarka'da Aarhus University, iNANO-Interdisciplinary Nanoscience Center'da doktora sonrası ve Yrd. Doç. Dr. olarak araştırmalarda bulundu. Tamer UYAR, Ocak 2009'dan itibaren Bilkent Üniversitesi, Malzeme Bilimi ve Nanoteknoloji Enstitüsü'nde ve UNAM-Ulusal Nanoteknoloji Araştırma Merkezinde araştırmalarına devam etmektedir. Tamer UYAR, Ekim 2011'de YÖK doçentliğini almış ve Mart 2014'te Bilkent Üniversitesi'nde doçent kadrosuna atanmıştır.

Tamer UYAR, yaptığı başarılı araştırmalar sonucunda Uluslararası düzeyde 2012 Fiber Society Distinguished Achievement Award ve Ulusal düzeyde 2014 TÜBİTAK Teşvik, 2012 TÜBA-GEBİP, 2010 ODTÜ Prof. Dr. Mustafa Parlar Araştırma Teşvik Ödülü ve 2009 FABED Genç Bilim İnsanlarına Üstün Başarı Ödülü (Feyzi Akkaya Bilimsel Etkinlikleri Destekleme Fonu) ödüllerine layık görülmüştür.

Tamer UYAR'ın şu ana kadar 125 civarında SCI kayıtlı uluslararası bilimsel dergilerde yayınlanmış makalesi ve bu bilimsel yayınlarına yapılmış 2500'e yakın atıfı vardır ve h-endeksi 29 tür (kaynak: Google Scholar). Tamer UYAR *Electrospinning (De Gruyter Open)* dergisinin kurucu Editörü ve *Journal of Nanomaterials* dergisinin Editörleri arasında olup, *e-Polymers* dergisinin de Editör danışman kurulunda görev yapmaktadır.

Doç. Dr. Tamer UYAR'ın araştırma konuları fonksiyonel nanoliflerin (nanofiber) elektro-eğirme (electrospinning) tekniği ile üretilmesi ve filtrasyon, çevre, biyoteknoloji, sağlık, nanotekstil, gıda, paketleme, katalizör, sensör, enerji ve nanokompozit alanlarında uygulamaları üzerinedir. Doç. Dr. Tamer UYAR'ın araştırmaları çeşitli TÜBİTAK projeleri, FP7 Marie Curie-IRG ve TÜBA-GEBİP tarafından desteklenmiştir.

Doç. Dr. Tamer Uyar

ELEKTRO-EĞİRME YÖNTEMİ İLE FONKSİYONEL NANOLİFLERİN ÜRETİLMESİ VE UYGULAMA ALANLARI

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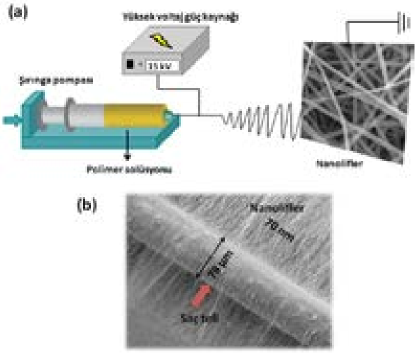
Elektro-eğirme (electrospinning) yöntemi nanolif/nanoağ (nanofiber/nanoweb) elde etmek için uygulanan kolay ve maliyeti düşük bir tekniktir. Bu teknikle çapları nano boyutta (10 nm- 500 nm) olan nanolif elde etmek mümkündür. Şekil 1a'da elektro-eğirme düzeneğinin şematik gösterimi ve bu yöntemle elde edilen nanoliflerin taramalı elektron mikroskop (SEM) görüntüsü yer almaktadır. Elektro-eğirme tekniği ile değişik polimerlerden, polimer karışımlarından, sol-jellerden, inorganik malzemelerden ve kompozitlerden nanolifler üretilmektedir. Elektro-eğirme tekniği ile üretilen nanofiber/nanoağ yapılar sıra dışı özellikler göstermektedirler. Bu nanolif/nanoağ yapılar çok yüksek yüzey alanına ve nano boyutta gözeneklere sahiptirler. Bu özellikleri sayesinde nanolif/nanoağ yapılar farklı fiziksel özellikler gösterirler ve yüzeyleri fiziksel/kimyasal yollarla modifiye edilerek çok işlevli hale getirilebilirler. Üstün özelliğe ve çok işleve sahip olan bu nanofiber/nanoağ malzemeler filtrasyon, fonksiyonel tekstil, enerji, sensör, katalizör, biyomühendislik sistemleri gibi birçok uygulama alanlarında kullanıma açıktır.

Uyar Araştırma Grubu'nda çalışmalarımızın temelini elektro-eğirme yöntemi ile fonksiyonel nanoliflerin üretimi oluşturmaktadır. Şekil 1b'de görüldüğü gibi bu tekniği kullanarak saç telinin bin katı inceliğinde nanolifler üretebilmekteyiz. Araştırma grubumuzda çalışmalarımız temel olarak Çevre (moleküler filtreler, su saflaştırılması, atık giderimi, ağır metallerin uzaklaştırılması, hava filtrasyonu, uçucu organik bileşiklerin (VOCs) uzaklaştırılması), NanoTekstil (antibakteriyel tıbbi tekstiller, koruyucu tabakalar), Nanobiyoteknoloji (yara örtüsü, kontrollü/devamlı salım sistemleri), Gıda ve aktif gıda paketleme (esansiyel yağlar, antioksidanlar ve antibakteriyeller gibi gıda katkı maddelerinin salım ve stabilizasyonu), Sensör (ağır metal sensörleri, patlayıcı sensörleri, biyosensörler), Tarım (nanogübre, tohum/bitki koruma, böcek ilaçlarının kontrollü salımı) ve Nanokompozit (yüksek performanslı nanoporlu malzemeler) gibi uygulama potansiyeline sahip yeni fonksiyonellikte nanolif/nanoağ malzemelerin elektro-eğirme yöntemi ile üretilmesine odaklanmıştır.



Şekil 1. (a) Elektrospin düzeneğinin şematik gösterimi ve elde edilen nanoliflerin SEM görüntüsü; (b) tek bir saç telinin üzerine toplanan nanoliflerin SEM görüntüsü.

*Bu çalışmalar TÜBİTAK (#110M612, #111M459, #213M185, #113Y348 ve 114Y264), FP7-Marie Curie IRG (Nanoweb) ve TÜBA-GEBİP tarafından desteklenmiştir.

SÖZLÜ
BİLDİRİLER
Oral Presentations

S-A1-001

SYNTHESIS OF FUSED THIOPHENE BASED ORGANIC POROUS MATERIAL FOR FOOD SAFETY

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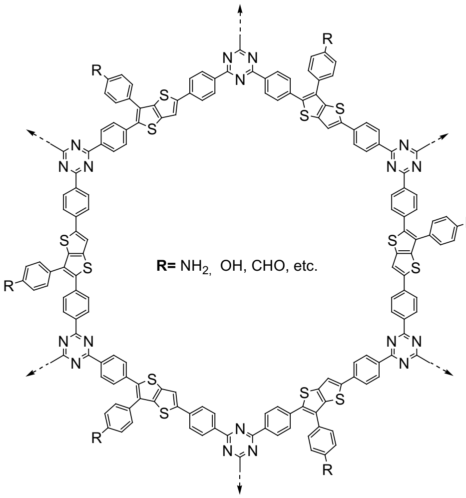
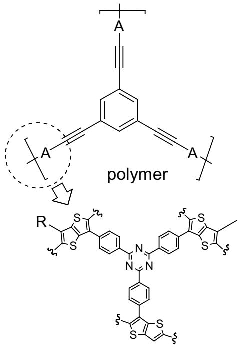
Fused thiophenes as e.g. thienothiophene (TT) and dithienothiophene (DTT) analogues of these compounds are known as strong electron donor compounds with π-conjugated electron systems. π-Conjugated oligomers and polymers have emerged as promising materials for applications in flexible, lightweight and low cost electronic devices such as organic light-emitting diodes (OLEDs), field-effect transistors (FETs), plastic lasers and photovoltaic cells, chemical sensors and indicators [1-3].





A

The main objective of this study is to prepare novel conjugated porous polymer networks, having functional groups to react with spoilage food volatile compounds, incorporating various sulphur (like DTT or EDTT) and nitrogen (like triazines) heterocycles. In conclusion, sulphur and nitrogen rich conjugated porous polymers will be synthesised and their food spoilage volatile compounds adsorption/separation properties will be investigated. Heteroatom and different functional groups containing structures have important properties for volatile adsorbing and chemically effecting.

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Keywords: thienothiophene, fused thiophenes, organic porous materials, OLEDs

S-A1-002

CONSTRUCTION OF NOVEL PYRROLOCARBAZOLES VIA HEMETSBERGER REACTION

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Carbazole and its derivatives are an important class of aromatic heterocyclic compounds in the area of medicinal chemistry [1]. In particular, heteroannulated carbazole alkaloids are found in numerous natural products and play an important role in pharmaceuticals [2]. Significant effort has been focused on the preparation of pyrrolocarbazole scaffolds due to their promising biological activities, such as antidepressant, anticancer and antibacterial activities [3,4]. Many synthetic approaches have been reported for the synthesis of pyrrolocarbazoles [5]. The Hemetsberger reaction is potentially an important method for the synthesis of indole derivatives, providing the foundation for access to many heterocyclic skeletons. The overall process to form an indole by the Hemetsberger strategy involves three steps; the synthesis of an alkyl azidoacetate, a base promoted Knoevenagel condensation between an azidoacetate and an aromatic aldehyde to form a vinyl azide and the thermolysis of the vinyl azide in an intramolecular cyclization to form the indole skeleton [6]. Recently, a new approach to Hemetsberger indolization using ethyl trifluoroacetate as a sacrificial electrophile in order to increase the overall yield of the Knoevenagel condensation is reported [7,8]. The aim of present investigation into the chemistry of pyrrolocarbazoles is to use the Hemetsberger strategy in the preparation of monomeric and dimeric pyrrole derivatives based on structurally rigid carbazole ring systems as precursors.

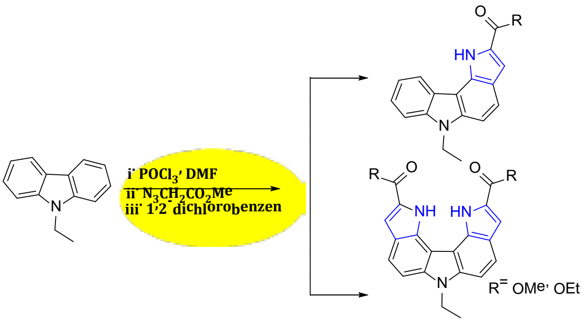

Figure 1: Syntetic pathway of pyrrolocarbazole

Acknowledgements: This study is supported by a grant (Project Number:113Z159) from the Scientific and Technological Research Council of TURKEY.

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Keywords: pyrrolocarbazoles, carbazole, Hemetsberger reaction, Knoevenagel condensation

S-A1-003

MICHAEL ADDITION OF 2-AMINOETHANETHIOL HYDROCHLORIDE TO CHALCONES WITH TRIETHYLAMINE-CATALYZED

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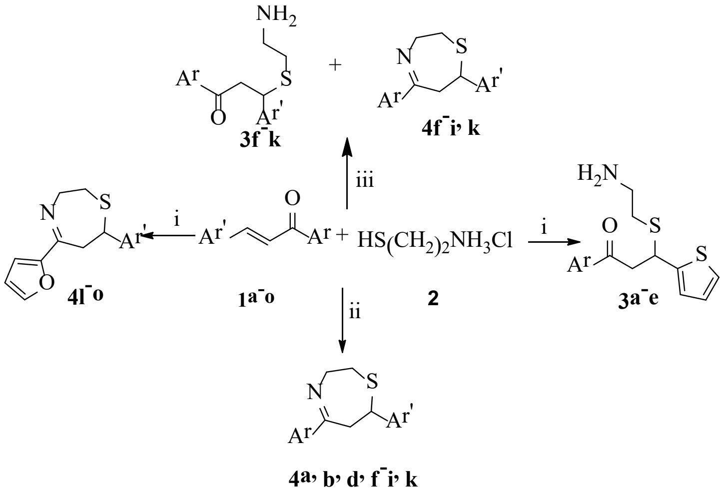
1,4-Thiazepinones and 1,4-thiazepines are important compounds whose biological and pharmacological properties have received much attention [1,2]. 1,4-Thiazepinones derivatives such as 1,4-thiazepin-5-one [3,4] and -2,4-dione [5] have been developed for the treatment of cancer, heart and inflammatory diseases. In this study, we revisited the thia-Michael addition of 2-aminoethanethiol hydrochloride (**2**) to chalcones (**1a-o**). The triethylamine-mediated addition of 2-aminoethanethiol hydrochloride (**2**) to particular chalcones bearing 2-thienyl and 2-furyl groups at the 1-and/or 3-position and synthesis of the novel mono adduct products (3-(2-Aminoethylthio)-1-(aryl)-3-(thiophen-2-yl)propan-1-ones) (**3a-o**) and the novel (5,7-diaryl-2,3,6,7-tetrahydro-1,4-thiazepines) (**4a-o**) are reported.



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Keywords: Chalcone, Michael addition, Thiazepine

S-A1-004

PREPARATION OF NOVEL HETEROCYCLES BASED ON INDOLES

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The indole or 2,3-benzopyrrole nucleus has been subjected to intense study over the last fourteen decades. The indoles are a class of heterocyclic compounds, widely found in nature, whose derivatives therefore have a strong link to natural products. Since the first synthesis of indole in 1866, a variety of synthetic methods for the construction of indoles have been explored [1]. The most commonly used methods for the preparation of indoles are the Fischer and Bischler indole syntheses [2,3]. In general the most reactive site of the indole nucleus with respect to electrophilic substitution is the C3 position. In the event that C3 is blocked by a substituent, electrophilic substitution is diverted to the C2 position [4]. More complex indoles, such as bis-indoles are very important biologically active scaffolds as they are found in many pharmacologically active alkaloids [5]. Given the various potential applications of bis-indoles, it is important to develop new classes of natural and unnatural bis-indole derivatives.

The central aim of the project was to develop novel bis-indole systems based on the methoxy activated indoles by using a modified Bischler indole synthesis. The synthesis of 2,2'-linked bis-indoles using different linkages by Fischer method was also examined (Figure 1).

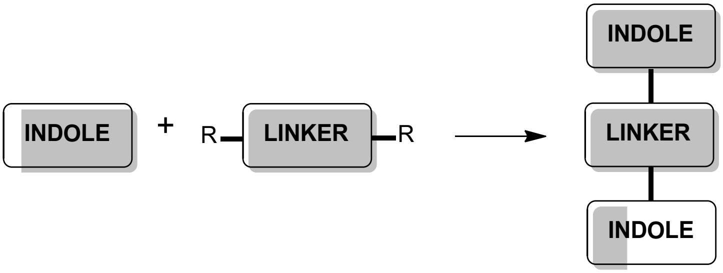

Figure 1. Representative structure of linked bis-indoles

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Keywords: indole, bis-indole, heterocycles

S-A1-005

SYNTHESIS, CHARACTERIZATION, ANTICANCER, ANTIMICROBIAL AND CARBONIC ANHYDRASE ISOENZYMES INHIBITION OF NOVEL (3aR,4S,7R,7aS)-2-(4-((E)-3-(ARYL)ACRYLOYL)PHENYL)-3a,4,7,7a-TETRAHYDRO-1H-4,7-METHANOISOINDOLE-1,3(2H)-DIONE DERIVATIVES

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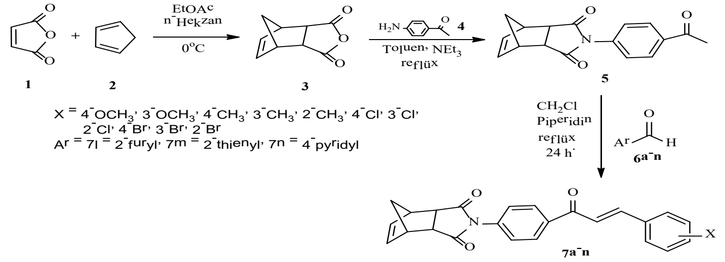
Chalcones, either natural or synthetic, are known to exhibit various biological activities such as anti-oxidant, antiinflammatory, antimalarial, antileishmanial,anticancer and antitumor [1]. Addition, the isoindole component has become attractive objects in organic and medicinal chemistry. The components attract great attention on account of their wide range of biological properties [2]. Carbonic anhydrases (CAs, E.C.4.2.1.1) are widespread and zinc dependent metalloenzyme. Theyalmost found in all living-organisms, therefore they are one of the most widely studied metalloenzymes [3].



In this study, a series of novel hybrid compounds, (3aR,4S,7R,7aS)-2-(4-((E)-3-(3-aryl)acryloyl) phenyl)-3a,4,7,7a-tetrahydro-1H-4,7-methanoisoindole-1,3(2H)-dionederivatives,were synthesized and evaluated for their anticancer, antimicrobial and inhibitory characteristics against CA isoenzymes I and II (hCA I and hCA II). The structures of new molecules (**7a-n**) were confirmed by means of IR, ^{1}H-NMR, ^{13}C-NMR and elemental analysis.Some of compounds showed very high anticancer activity with the inhibition range of 80.51-97.02% compared to 5-FU. Addition all compounds exhibited excellent inhibitory effects, in the low nanomolar range, with Ki values in the range of 27.07-37.80 nM against hCA I and in the range of 11.80-25.81 nM against hCA II. Our findings suggest thatthe new isoindolylthiazolederivativessuperior inhibitory effect over to acetazolamide (AZA), which is used as clinical CAs inhibitor had been shown Ki value of 34.50 and 28.93 nM against hCA I and II isoenzymes, respectively.

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Keywords: Carbonic anhydrase, Enzyme inhibition,Chalcones

S-A1-006

COMPREHENSIVE SYNTHESIS OF MONOHYDROXY–CUCURBIT[n]URILS (n = 5, 6, 7, 8): HIGH PURITY AND HIGH CONVERSIONS

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We describe a photochemical method to introduce a single alcohol function directly on cucurbit[n]urils (n = 5, 6, 7, 8) with conversions of the order 95– 100% using hydrogen peroxide and UV light. The reaction was easily scaled up to 1 g for CB[6] and CB[7]. Spin trapping of cucurbituril radicals combined with MS experiments allowed us to get insights about the reaction mechanism and characterize CB[5], CB[6], CB[7], and CB[8] monofunctional compounds. Experiments involving ^{18}O isotopically labeled water indicated that the mechanism was complex and showed signs of both radical and ionic intermediates. DFT calculations allowed estimating the Bond Dissociation Energies (BDEs) of each hydrogen atom type in the CB series, providing an explanation of the higher reactivity of the " equatorial" C–H position of CB[n] compounds.. Yet CB[5]– (OH)1 and CB[8]– $(OH)_1$, the first CB[8] derivative, were obtained in excellent yields thanks to the soft method presented here[1].

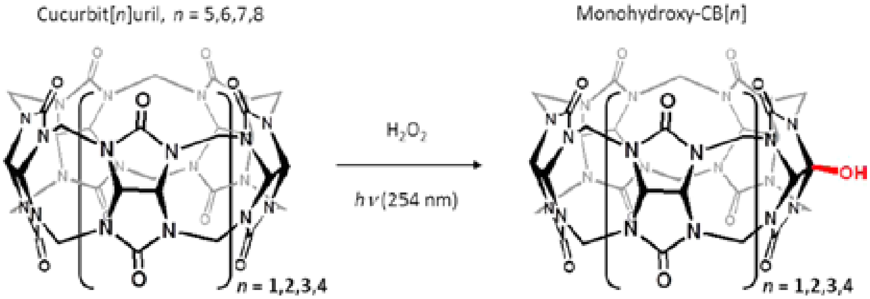

Figure 1: Synthesis of CB-OH derivatives with hydrogen peroxide and UV light

Acknowledgements: We would like to thank Drs. Christopher I. Ratcliff e and John A. Ripmeester for their help regarding an X-ray structure, which greatly inspired this work. L.C. acknowledges support from Spectropole, the Analytical Facility of Aix-Marseille University, by allowing a special access to the instruments purchased with European Funding (FEDER OBJ2142-3341). We also acknowledge Pr. Didier Siri for his help regarding the calculations of bond dissociation energies and Dr. Stéphane Gastaldi for the use of the Rayonet reactor. CNRS, Aix-Marseille Université and Région PACA (project " Masked Spins") are acknowledged for financial supports. The authors are also grateful to the EPR facilities available at the national TGE RPE at Aix-Marseille University.

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Keywords: Cucurbituril, Radical, Functionalization

S-A1-007

TUMOR SITE ACTIVATABLE DISULFIDE-BRIDGED TETRAPYRROLES FOR SELECTIVE PHOTODYNAMIC THERAPY

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Photodynamic therapy (PDT) is an alternative method to classical cancer treatments, in which reactive oxygen species are produced to damage/kill diseased cells upon irradiation of a photosensitizer via the generation of $^1O_2$. One of the drawbacks of PDT is the low selectivity of photosensitizers to tumours, which can make the patient sensitive to sunlight [1]. In order to overcome this problem, targeting strategies towards tumours have been developed by exploiting the differences of tumour cells to healthy cells. By conjugating various biomolecules to photosensitizers, strategies to target various receptors overexpressed in tumour cells have been used so far: carbohydrates [2], lipoproteins [3], antibodies [4], aptamers [5] etc. Another emerging strategy is using molecular structures active only at the tumour site [6]. In this approach, photosensitizers are conjugated with a quencher which deactivates the photodynamic activity and singlet oxygen generation. This conjugation is done with a linker which can only be cleaved in tumour-specific conditions: higher pH, reductive media, higher temperature or overabundance of various enzymes or proteins (photodynamic molecular beacons (PMB) [7]). Glutathione is one of these factors. Its strong concentration in tumour tissues breaks the disulfide bonds in proteins [8]. Various quenchers can be used to deactivate the photosensitizer with FRET effect: ferrocene [9], carotenoid [10], amino groups. As two photosensitizers can quench themselves if they are close to each other, self-quenching strategies were also developed lately [11].

In this study, self-quenched tetrapyrrolic photosensitizers have been designed and will be synthesized. Dimeric porphyrins and phthalocyanines linked to each other by disulfide bridge (cleavable by glutathione) are expected to be aggregated thus not able to generate singlet oxygen. The cleavage should induce their monomerisation and restore their SOG capacity. Different spacer lengths and nature as well as different substitution pattern on the tetrapyrrole core will be tested. Finally, the relevance of the concept will be assessed as photophysical and photochemical characterizations of these photosensitizers will be investigated to determine their potential as photosensitizers.

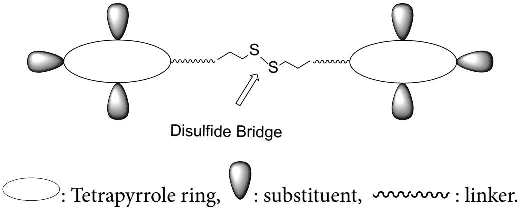

Figure 1: Schematic representation of disulfide bridged tetrapyrroles.

Acknowledgements: The Scientific and Technological Research Council of Turkey (TUBITAK) is gratefully acknowledged for the funding of these studies (project 214Z099).

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Keywords: Selective PDT, tumour site activation, glutathione, tetrapyrrole

S-A1-008

SYNTHESIS SOME NEW 1,2,4-TRIAZOLES, THEIR MANNICH BASES AND EVALUATION OF THEIR ANTIMICROBIAL ACTIVITIES

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Nalidixic acid commonly named as 1-ethyl-7-methyl-4-oxo-1,4-dihydro-1,8-naphthyridine-3-carboxylic acid chemically belongs to 4-quinolone class antibiotics. The 4-Quinolones are the important antimicrobial agents that have been known for over 40 years [1]. The quinoline ring are reported as highly effective and have significant tissue penetration property and inhibit the DNA synthesis by forming complexes with DNA gyrase or topoisomerase II enzyme [2]. The Mannich reaction has been used to form carbon–carbon bonds between a secondary amine and a ketone resulting β-amino ketone. N-Mannich bases have been used as potentially useful prodrug candidates for imides, amides, amines, hydantoin and urea derivatives. There are several other Mannich bases that are available with remarkable biological significance [3]. The development of hybrid molecules through the combination of different pharmacophores in one frame may lead to compounds with interesting biological profiles. In the present study, a series of new azoles with substituted nalidixic acid side chains were designed and synthesized as antimicrobial agents. The spectral data and elemental anlyses have support the proposed structures.

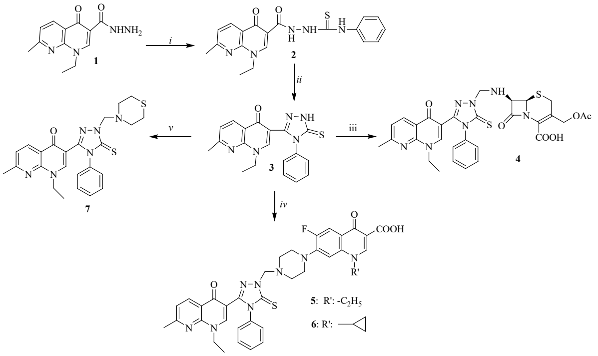

Figure 1: *i*: Phenyl isothiocyanate; *ii*: NaOH; *iii*: 7-aminocephalosporanic acid, HCHO; *iv*: norfloxacin (for 5) ciprofloxacin (for 6), HCHO; *v*: thiomorpholine, HCHO.

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Keywords: Quinolene, 1,2,4-triazole, Mannich base, Biological activity

S-A1-009

SYNTHESIS OF ELECTRON-RICH SHAPE-PERSISTENT MACROCYCLE - PALVASHALINE: A POSSIBLE CANDIDATE IN MOLECULAR ELECTRONICS, CHEMOSENSING, NANOTUBES AND ION CHANNELS

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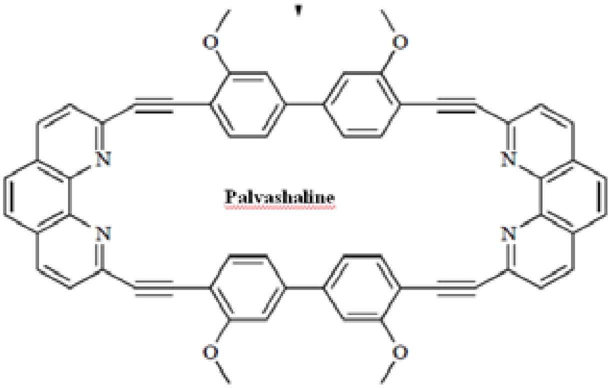

Figure 1: Molecular structure of Palvashaline – a shape persistent macrocycle

We have synthesized a rigid shape-persistent fluorescent macrocycle **palvashaline** [1] using Sonogashira coupling reaction and TIPS-decoupling in a single pot. 2,9-dichloro-1,10-phenanthroline was reacted with TIPS-protected diyne in the presence of $Pd(PPh_3)_2Cl_2$, CuI and TBAF at 100 °C. **Palvashaline** was obtained as yellow fluorescent compound; characterized by NMR, ESI, MALDI-TOF, CHN, IR and UV visible spectroscopy. In chloroform, **palvashaline** showed $l_{ex\text{-}max}$ at 331 nm while $l_{em\text{-}max}$ was observed at 407 nm; a Stokes shift of 78 nm. Under UV light, **palvashaline** showed more fluorescence in $CHCl_3$, ethanol, and DMF while the fluorescence was quenched in triethylamine. **Palvashaline** will be used in various applications of [poly]catenanes, molecular electronics, supramolecular chemistry and nanotechnology. We have already published 2,9-dichloro-1,10-phenanthroline, which was synthesized during this work, as a naked-eye chemosensor against Ag(I) [2]. Work on variously functionalized macorcycles is on the go.

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Keywords: Palvashaline, Sonogashira coupling, Bukhwald-Hartwig coupling, Shape-persistent macrocycles

S-A1-010

NEW HYDROPHOBIC MACROMONOMERS WITH ALKYL BROMIDE END-GROUP

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Poly(3-hydroxypropionate), is a well-known biodegradable [1] thermoplastic polyester with high tensile strength, elongation at breaking and high moisture permeability. There are some reports on its potential utilization as scaffold material in tissue engineering [2], as polymeric matrix for drug delivery [3] and dielectrically functional application [4]. Oligomer of 3-hydroxy propionate was synthesized by base-catalyzed hydrogen transfer polymerization (HTP) of acrylic acid using tNaBuO as a strong basic catalyst. Similarly, oligomers of 2-methyl nylon3 (2mN3) and 3-methyl nylon3 (3mN3) were synthesized by base-catalyzed hydrogen transfer polymerization (HTP) of methacrylamide and crotonamide, respectively. Structural analyses were performed using MALDI-MS, ^{1}H-NMR and end-group analyses to reveal the structure of oligomers in detail. The sum of the structural analyses revealed that the oligomeric products obtained have olefinic chain-ends that are open to possible end-group functionalization. End-group modifications were performed through mono bromination [5] by HBr in acetic acid . Conversions of olefinic end-groups to alkylbromide groups were followed by using elemental analysis, ^{1}H-NMR and MALDI spectroscopy. The final products may be regarded as novel macromonomers for amphiphilic block copolymers, surface modification agent and grafting agent.

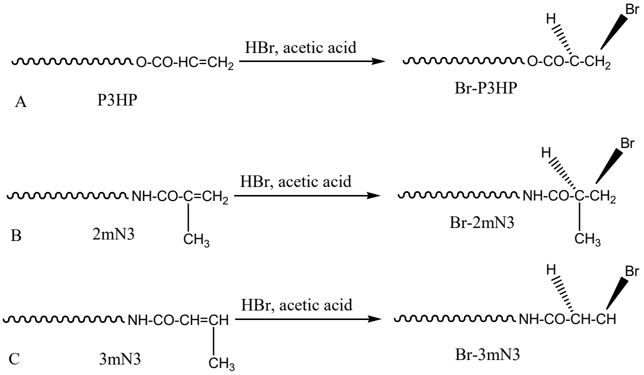

Figure 1: End-group functionalization of P3HP, 2mN3 and 3mN3 oligomers through mono-bromination, respectively.

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Keywords: End-group modification, hydrogen transfer polymerization, macromonomer

S-A1-011

SYNTHESIS, SPECTROSCOPIC PROPERTIES AND DFT CALCULATIONS OF SOME NOVEL MONO AZO DYES DERIVED FROM 5-NITROANTHRANILIC ACID

Çiğdem *KARABACAK ATAY*[1], Merve GÖKALP[2], *Hasan Hüseyin KART*[3], *Tahir TİLKİ*[2]

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Mono azo dyes containing heterocyclic moieties are very important class of disperse dyes. Because of their piquant properties, these dyes have been shown to be important colorants in industrial applications [1-3]. Recently, theoretical calculations of azo dyes have been performed by several research groups [4-6].

In the present study, four novel mono azo dyes were synthesized by coupling cyclizated active methylene compounds respectively malondinitrile, ethylacetoacetate, acetylacetone and 3-aminocrotononitrile with diazonium salts derived from 5-nitroanthranilic acid. Their structures were characterized with spectroscopic methods (FT-IR, ^{1}H NMR and UV–vis). Solvatochromic properties in chloroform, acetic acid, methanol, dimethylformamide (DMF) and dimethylsulphoxide (DMSO) were studied. Molecular structures of four new azo dyes: 2-[(3,5-diamino-1H-pyrazol-4-yl)diazenyl]-5-nitrobenzoic acid (**A**), 2-[(3-hydroxy-5-methyl-1H-pyrazol-4-yl)diazenyl]-5-nitrobenzoic acid (**B**), 2-[(3,5-dimethyl-1H-pyrazol-4-yl)diazenyl]-5-nitrobenzoic acid **(C)** and 2-[(5-amino-3-methyl-1H-pyrazol-4-yl)diazenyl]-5-nitrobenzoic acid **(D)** have also been studied by using Density Functional Theory (DFT). Spectroscopic properties of synthesized dyes examined with the experimental techniques have been verified with the theoretical results. It is shown that theoretical and experimental data are compatible with each other.

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Keywords: Density Functional Theory, Heterocyclic dye, Mono Azo Dyes, Spectroscopic property, Theoretical calculation

S-A1-012

THE SYNTHESIS AND THEORETICAL CALCULATIONS OF N-(1,3-BENZOTHIAZOLE-2-YL)-N-(1,4,5,6-TETRAHYDROPYRIMIDINE-2-IL) AMIN'S DERIVATIVES

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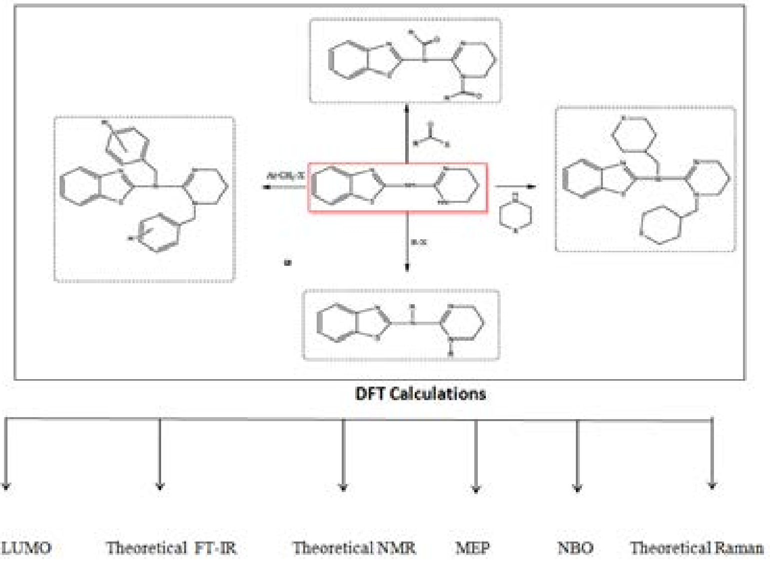
Small-ring heterocycles including nitrogen and sulfur have been under investigation for a long time by reason of their synthetic diversity and therapeutic relevance[1]. Thiazole derivatives are associated with a broad spectrum of biological properties including, antimicrobial, anticonvulsant, bacteriostatic activities, antituberculous,antiviral, antimalarial, anticancer, inflammation, hypertension, HIV infections and more recently for the treatment of pain, as fibrinojen receptor antagonists with antithrombotic activity, as new inhibitors of bacterial DNA gyrase B [2].



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Keywords: tetrahydropyrimidines, DFT, Benzothiazole

S-A1-013

THE SYNTHESIS, CHARACTERIZATION, DFT AND DOCKING CALCULATIONS OF IMIDAZOLIDINE-2-THIONE DERIVATIVES

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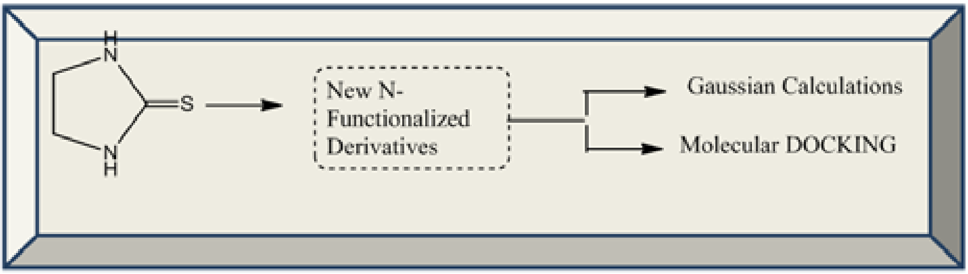
Imidazole ring system is demonstrated in important biological building blocks, such as histidine, and the relevant hormone histamine [1]. The imidazole nucleus appears in a number of naturally occurring products like the amino acids histidine and purines, which comprise many of the most important bases in nucleic acids. Imidazole derivatives possess a broad spectrum of pharmacological activities such as anti-Parkinson, anticonvulsant activity [2] In this work, we report combined experimental and theoretical studies on molecular structure, vibrational spectra, and NBO analysis of the synthesized benzoyle and benzyl mannich derivatives of the Imidazolidine-2-thione. The inhibition activities of compounds with the protein BRCA2, is simulated by using AutoDock Vina software. Docking of synthesized compound against BRCA2, forget enzyme for MCF-7 cancer cell agent was achieved to explore the interactions of discovered hits within the amino acid residues of enzyme binding pocket.



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Keywords: İmidazolidine, DFT, Docking

S-A1-014

SYNTHESIS OF NEW IMIDAZOLE-BASED HETEROCYCLIC MOLECULES AND EVALUATION OF THEIR APPLICATIONS

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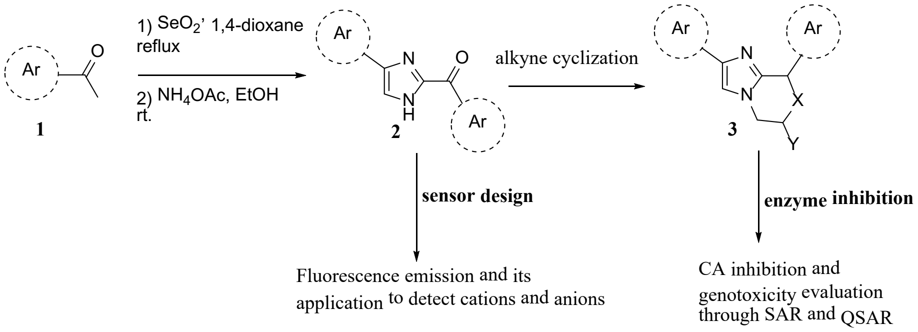
Imidazole ring is a crucial heterocyclic ring and an important subunit for many material-designed applications. Furthermore, it has two nitrogens which have different chemical properties resulting in many different chemical reactions which allow to reach valuable materials.

This study includes two parts as followed; (i) synthesis of imidazol-based starting materials and their further cyclization reaction through organometallic approach and (ii) evaluation of applications of these imidazole-based monocyclic or bicyclic molecules.

Starting materials **2** were synthesized by following the literature with slight modification (Scheme 1)[1]. Alkynes cyclization were proceed by using different metal catalysts such as Pd, Cu, Au, Ag, Rh, Ru and these reactions gave imidazole-based heterobicyclic molecules **3**.



Scheme 1: Synthetic routes and application map for imidazole molecules

Molecule **2**s were subjected to detect cations and anions through fluorescence emission. Planarity and EDG (electron donating group) and EWG (electron withdrawing group) groups were evaluated to increase fluorescence intensity and to reach red-shifted molecules. With these researches, we have designed sensors to detect cation and anion, selectively [2]. Heterobicyclic molecules **3** have been subjected to inhibit CA (carbonic anhydrase) enzymes and to evaluate their genotoxicity through SAR (structure-activity relationship) and QSAR(quantitative structure-activity relationship) modellings.

Acknowledgements: Authors greatly acknowledge financial support in the TÜBİTAK (115Z112), the TÜBİTAK-COST (115Z894), YYÜ Faculty of Pharmacy and YYÜ-BAP (2014ECZ-B170).

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Keywords: alkyne cyclization, catalyst, imidazole, fluorescence, sensor

S-A1-015

SYNTHESIS OF SOME BROMINATED DIARYLMETHANONE DERIVATIVES

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The number of natural organohalogen compounds in literature is increasing from 30 in 1968 to 200 in 1973 to more than 5,000 today [1]. More than half of natural products containing halogens are the products with bromine [1, 2]. Most of them are bromophenols having biological activities such as a potent enzyme inhibitor [3, 4], antioxidant activity [5] and cytotoxicity against cancer cell lines [6]. Bromophenols **1-3** whose structures are diarylmethanone derivatives also exhibits biological activities [3-5].

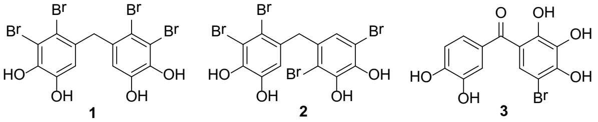
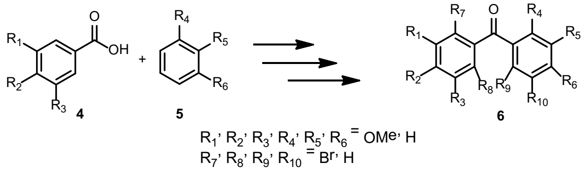


Figure 1: Some biologically active compounds (**1-3)** including natural producs **1** and **2**.



Scheme 1: Synthesis of brominated diarylmethanone derivatives (**6**)

In the present study, acylation reactions of benzoic acid derivatives (**4)** with aromatic compounds **5** gave diarylmethanone derivatives in the presence of Eaton's Reagent ($MeSO_3OH$)/P_2O_5). To synthesize new brominated diarylmethanone derivatives (**6**), the diarylmethanones was reacted with bromine (Br_2) or ceric ammonium nitrate/lithium bromide (CAN/LiBr) in different conditions. For formations of the bromophenols derivatives, the bromination reactions were investigated.

Author thanks to Ataturk University in this study (Scientific Research Projects, Project No: 2012/214).

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Keywords: Diarylmethanone, Bromination, Bromophenols, Enzyme inhibition

S-A1-016

DESIGN, SYNTHESIS AND CHARACTERIZATION OF NOVEL NITROAROMATIC COMPOUNDS HAVING BIOLOGICAL ACTIVITIES

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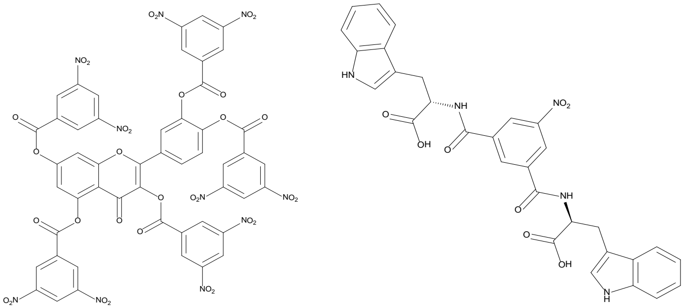
Nitroaromatics and organic nitrates constitute an important classes of therapeutic agents against a variety of protozoan and bacterial infections of humans and animals, as well as prodrugs (bioreductive agents), useful for the treatment or imaging of hypoxic tumors [1-4]. The inhibitory ability of these compounds on glutathione reductase activity was demonstrated by a recent study. In addition, it was also proposed that these compounds could be used as antimalarial agents [5,6].

In this study, we carried out the synthesis and characterization of novel nitroaromatic compounds [7,8], which will be subsequently used at biological activities studies. These compounds were synthesized via esterification and amidation reactions. 3.5-dinitrobenzoyl chloride, 4-dinitrobenzoyl chloride and 5-nitroisophthaloyl chloride as acyl chloride and phenolic compounds such as quercetin, resorcinol, phenol, 4-nitrophenol, 2-naphthol and amino acids such as tryptophan and tyrosine as coupling reagents were utilized for synthesis of molecules in this study. These compounds were synthesized in high yield and characterized by SEM, FT–IR, ^{1}H NMR and ^{13}C NMR. In addition, the specific optical rotation chiral compounds were determined by polarimetry. Two examples of the synthesized compounds are shown below.



2-(3,4-bis((3,5-dinitrobenzoyl)oxy)phenyl)-4-oxo-4*H*-chromene-3,5,7-triyl tris(3,5-dinitrobenzoate)   (2*S*,2'*S*)-2,2'-((5-nitroisophthaloyl)bis(azanediyl))bis(3-(1*H*-indol-3-yl)propanoic acid)

Figure 1: Molecular structures of synthesized nitroaromatics compounds

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Keywords: Nitroaromatic esters, nitroaromatic amides, synthesis, characterization

S-A1-017

SYNTHESIS, CHARACTERIZATION AND ANTIGLYCATION OF NEW FAMILY OF HETEROCYCLIC SCHIFF BASES

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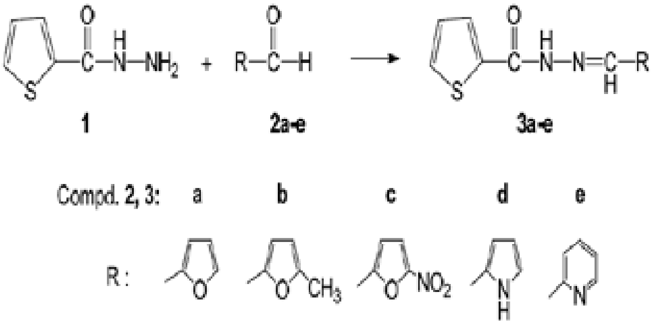
Schiff bases as nitrogen unsaturated organic compounds are well known ligands which received so much attention in chemistry [1, 2]. As pigment and dyes, corrosion inhibitors, and small molecules catalysts activators as well as in biological activities [2]. Schiff base, structurally known as azomethine or imine, is a nitrogen analogue of ketone or aldehyde in which the carbonyl group has been replaced by an azomethine group after water molecules elimination [2].

In connection with previous research that belongs to our group on the synthesis, characterization, complexation and biological application of mono- or polydentate Schiff bases [3, 4], here in this work, several novel Schiff bases compound were made available, as Schemed, their antiglycation effect was evaluated [4].



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Keywords: Schiff base, NMR, FT-IR, condensation, XRD, antiglycation

S-A1-018

SYTHESIS OF NEW β-LACTAM DERIVATIVES BY USING IMINES AND SCHIFF BASES

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β-lactam ring, one of the important bioactive rings in organic chemistry, has important roles in the agent structure of drugs that are derivatives of penicillin. β-Lactam antibiotics are a broad class of antibiotics, consisting of all antibiotic agents that contain a β-lactam ring in their molecular structures. Schiff bases are frequently used in addition reactions, Staudinger Reactions, Hetero–Diels–Alder reactions, and several ligand complexes, thanks to their structural characteristics.[1] Synthesis of β-lactam analogs, which are containing dichloride atoms, alcholates and N-aromatic rings, was achieved by Schiff bases and several ketene compounds.[2,3]

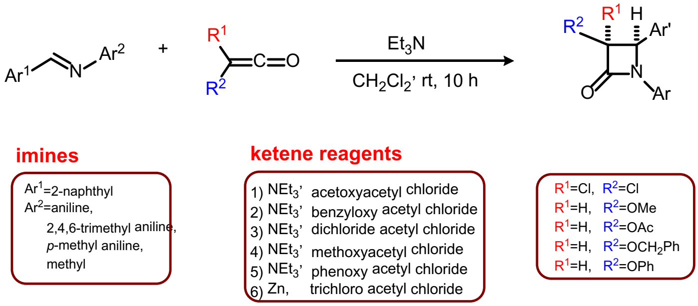

Figure 1. Synthesis of β-lactam ring via Schiff bases.

In the present study, practical and efficient method has been developed for N-aryl β-lactams the first time in literature from Schiff bases and simple several ketene compound. Schiff base reactions are widely used in chemistry due to their mild reaction conditions and high reaction rates. The synthesis of β-lactams derived from these Schiff bases and the dichloroketene by using [2 + 2] addition reaction. The acetoxy acetyl chlorine, benzyloxy acetyl chlorine, 2,2-dichlorine acetyl chlorine, methoxy acetyl chlorine and phenoxy acetyl chlorine reactants have been used for this addition as ketene reactants, and β-lactam derivatives have been obtained by a simple method by using NEt_3 under basic conditions.[4]

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Keywords: beta-Lactam,Schiff Bases, Addition reactions

S-A1-019

CATALYTIC DEHYDROGENATION OF SECONDARY ALCOHOL TO KETONE IN LIQUID PHASE

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Ketones are an important class of industrial chemicals that have found a widespread use as solvent and as chemical intermediates. Among the ketones methyl ethyl ketone, which is one of the most used ketone, has very good solvent properties, fast evaporation rate, and is miscible with organic solvents [1]. Ketones have been produced in catalytic dehydrogenation of secondary alcohols in vapor phase [2]. In order to maintain vapor phase condition, high temperature (300-500ºC), which can cause side reactions, is required. Another disadvantage of vapor phase process is that the lifetime of dehydrogenation catalyst is relatively low [1].

In this study, methyl ethyl ketone was produced via catalytic dehydrogenation of secondary butyl alcohol in liquid phase at relatively low temperature (160-190ºC). Effects of temperature on conversion of sec-butyl alcohol and reaction rate were investigated. Reaction was followed, and conversions were determined by measuring leaving H_2. Obtained ketone products were also analyzed by using FTIR and GC spectrometer. Optimum process conditions of methyl ethyl ketone production process were determined by studying at different conditions. Comparing to literature [3,4] relatively high conversion (about 70%) was obtained at optimum determined conditions. After distillation, methyl ethyl ketone was obtained in 99.13% purity. Moreover, economic analysis showed that developed ketone production process is profitable in industrial scale.

Acknowledgements: This study was supported by TÜBİTAK 2209-A University Students Domestic Research Program

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Keywords: Ketone, secondary alcohol, methyl ethyl ketone, dehydrogenation, liquid phase.

S-A2-001

SYNTHESES AND SPECTROSCOPIC CHARACTERIZATIONS ON NEW DITHIOPHOSPHONATO COMPLEXES OF Ni(II), Cd(II), Hg(II) AND Ni-PYRIDINE COMPLEXES

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In this study, a new dithiophosphonic acid (DTPOA), namely, O–3-phenyl-1-propyl-(4-methoxyphenyl) dithiophosphonic (LH) and its Ni(II), Cd(II) and Hg(II) complexes were prepared, and their structures elucidated. DTPOA compound was obtained by the reaction of the Lawesson reagent, (LR), (2,4–bis-(p-metoxyphenyl)–1,3,2,4–dithiodiphosphetane–2,4–disulphide) with the corresponding alcohol. It was purified through the crystallization of its ammonium salts, $[CH_3O\text{-}C_6H_4\text{-}(C_6H_5O\text{-}(CH_2)_3\text{-})P(S)S]^-$ $[NH_4]^+$ (NH_4L). The complexes were all of the stoichiometry of $[M(L)_2]_x$, with x=1 for $M=Ni^{2+}$, ($[Ni(L)_2]$) and x=2 for M= Cd^{2+} and Hg^{2+} ($[M_2(\mu\text{-}L)_2(L)_2]$), (Figure 1).

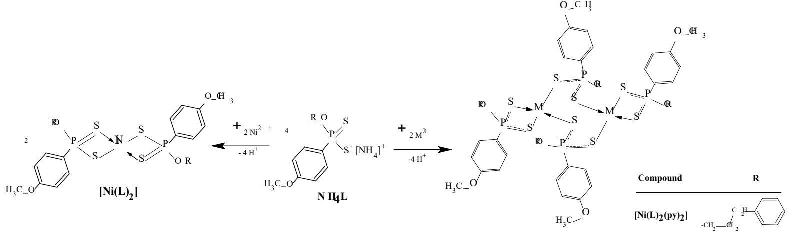

Figure 1: Syntheses reactions of complexes.

The nickel complexes was further treated with pyridine, which led to the formation of octahedral dipyridine derivatives (Figure 2). Similar to many other nickel(II) complexes, the nickel(II) dithiophosphonic acid complexes react reversibly with pyridine to yield the octahedral complexes ($[Ni(L)_2(py)_2]$ and $[Ni(L')_2(py)_2]$) [1,2].

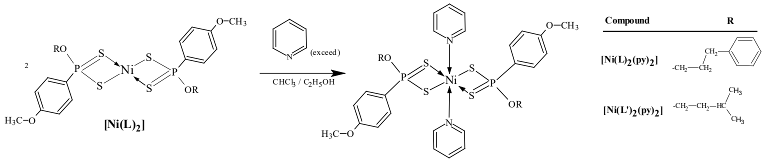

Figure 2: Syntheses reactions of pyridine nickel complexes.

The compounds were characterized by elemental analysis; MS; FTIR and Raman spectroscopies. The NH_4L, $[Ni(L)_2]$, $[Cd(\mu\text{-}L)_2(L)_2]$ and $[Hg(\mu\text{-}L)_2(L)_2]$, were also investigated by ^{1}H-, ^{13}C- and ^{31}P- NMR. The magnetic susceptibilities of the pyridine nickel complex was measured to confirm and the geometries for the $[Ni(L)_2(py)_2]$. $[Ni(L')_2(py)_2]$ complex was also characterized by X-ray crystallography.

Acknowledgements: We gratefully acknowledge the financial assistance of Research and Application Centers of Bozok University (BAP 2013 FB / T51).

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Keywords: Dithiophosphonic acid, Dithiophosphonato complex, Thio-phosphorus compounds

S-A2-002

SYNTHESIS OF NANO AND MICRO PARTICLES $PbIn_2Se_4$-ONE OF HIGH RESPECTIVE SOLOR CELL COMPONENTS

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The triangulation of the Pb–In–Se system has been performed using XRD and EDX measurements. In addition to six binary phases, two ternary phases were observed; the ternary diagram is thus divided at room temperature into 11 secondary triangles. Two forms have been obtained at room temperature for In_2Se_3, but the corresponding secondary triangle, because of its narrowness, could not be observed. No ternary solubility in the binary intermediate and terminal phases has been observed [1]. Phase equilibria in the Se-rich part of the Pb–In–Se system have been investigated by metallographic examinations, DTA, DSC, XRD and EDX measurements. Two ternary phases were observed: S ($Pb_{1.46}In_{2.86}Se_{5.71}$) and B′ ($Pb_{0.8}In_{3.5}Se_{5.7}$). The S compound was found to form congruently, while the B′ compound forms incongruently. Reactions of alloys crystallization are determined for the Se–rich part. Miscibility gaps which emerge from the In–Se and Se–Pb binary systems extend into the ternary system to form one gap across it. Reaction scheme for the PbSe–Se–InSe system is proposed. [2].

The mix indium hidroksid with asetate of lead (II) is dissolved in ethyleneglycol and to it increases as selenizing solution reagent in borane. The experimental ware in a teflon ditch is located in the microwave electric oven. Test within 7 hours at 443 K to temperature remains in the furnace. The received deposit is filtered via the glass filter, washed out by the diluted solution of hydrochloric acid, ultrapure water, at last, ethyl alcohol, is dried up at 333-343 K in vacuum.

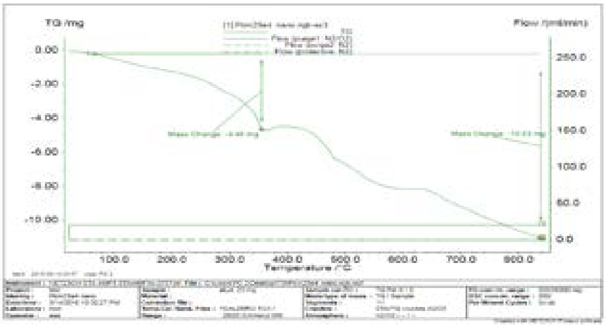

Figure 1. Thermogravimetric and differential and calorimetric analyses of nanoconnection of $PbIn_2Se_4$ received at 443 K within 7 hours

Conclusion: The exit makes 85-87%. Chemical, thermographic and morphological analyses $PbIn_2Se_4$ are executed, and is established that crystals of connection are presented in the flaky form of nano and microcores.

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Keywords: chemical analysis, hydrothermal method, lead indium selenide, nano- and microparticles, thermographic analysis

S-A2-003

SYNTHESIS OF COUMARINE SUBSTITUTED CROWN ETHER COMPOUNDS AND INVESTIGATION OF FLUOROIONOPHORE BEHAVIOURS

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Crown ethers are multidentant macrocycle compounds. Their characteristic properties are the ability to solubilize inorganic compounds in organic solvents and thus increase the range of their reactivities. The size of the cavity availible in each crown ether varies and determines the types of cation which is bound most efficiently [1]. Crown compounds containing fluorescent substituents can offer great potential for the qualitative and quantitative analyses of various metal ions.

Macrocycle that possesses ionophore ability has been subject for extensive investigation not only fo the synhetic protocol but also for its potential applications. There is a growing interest in synthesizing crown ether derivatives with fluorescence properties showing marked changes upon metal complexation, aiming to develop metal ion-selective and sensitive material [2,3].

In this study, from the reactions of 4', 5'-Bis(bromomethyl)benzo15-crown-5 with 4-hydroxycoumarin and 7- hydroxycoumarin, new crown ether compounds (**1** and **2**) were synthesized. Structures of the new ligands (**1** and **2**) were characterized by the element analysis, IR, ^{1}H-NMR, ^{13}C-NMR and MS spectroscopic data. The effect of metal cations (Li^+, Na^+, K^+, Mg^{2+}, Ca^{2+}, Ba^{2+}, Ag^+, Al^{3+}, Ni^{2+}, Pb^{2+}, Cu^{2+}, Zn^{2+}, Fe^{3+}, Co^{3+}, Cr^{3+}) on the absorption and fluorescence spectra of compounds **1** and **2** was investigated.

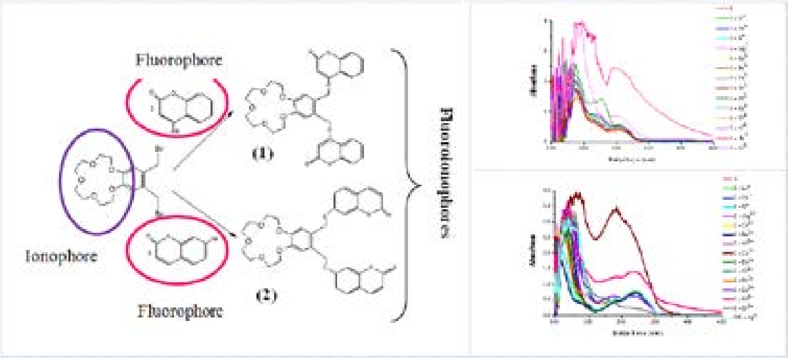

Figure 1: Synthesis reactions of coumarin substituted crown ether compounds and absoption spectra of synthesized compounds (**1** and **2**)

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Keywords: Crown Ethers, Fluoroionophores, Fluorescence, Metal ions

S-A2-004

BODIPY DECORATED DENDRIMERIC CYCLOTRIPHOSPHAZENE PHOTOSENSITIZERS: SYNTHESIS AND EFFICIENT SINGLET OXYGEN

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Singlet oxygen is of great importance for various applications such as wastewater treatment, blood sterilization and photodynamic therapy (PDT).[1] Photodynamic therapy (PDT) is a very effective and novel technique for the treatment of malignant tumors.[2-4]Three main components are required for photodynamic activities which are a photosensitizer (PS), the light and the singlet oxygen. During the photodynamic reaction, the PS is excited with red or near infrared light, generating reactive oxygen species such as singlet oxygen, and thus irreversibly damaging tumor cells.[5]

In the present work, syntheses of BODIPY decorated dendrimeric cyclotriphosphazenes are described. The newly synthesized dendrimeric cyclotriphosphazenes have been characterized by ^{1}H, ^{13}C, ^{31}P NMR spectroscopies, and UV–vis electronic absorption spectra. Singlet oxygen generation capacities of novel compounds are performed using the trap molecule 1,3-diphenylisobenzofuran and the appropriate photo degradation by light irradiation of these compounds were investigated.

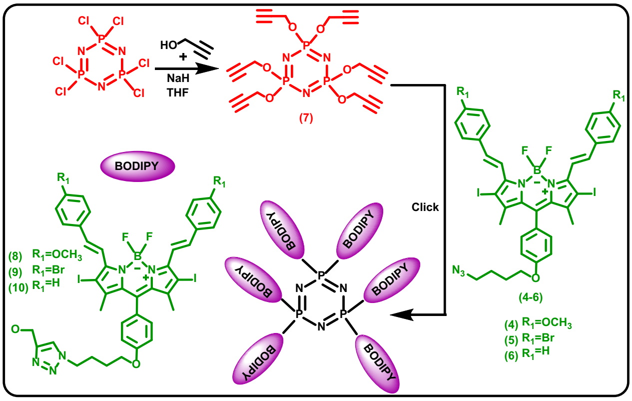

Figure 1: BODIPY decorated dendrimeric cyclotriphosphazenes

Acknowledgements: The authors would like to thank the Scientific and Technical Research Council of Turkey for financial support (grant 114Z445).

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Keywords: Cyclotriphosphazene, Bodıpy, Photosensitizers, Singlet Oxygen

S-A2-005

COORDINATION CHEMISTRY OF ANTIMONY(III) COMPLEXES WITH LIGANDS CONTAINING SULFUR DONOR ATOMS

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Antimonials, such as sodium stibogluconate (Pentostam) and meglumine antimonite (Glucantime), have been widely used for several decades for the treatment of leishmaniasis, a parasitic infection caused by various species of the protozoan *Leishmania* [1]. Although the mechanism of action of these drugs is still unknown, it has been proposed that the anti-leishmanial activity of Sb(V) compounds depends on its reduction to Sb(III) inside parasites by the tripeptide of glutathione (GSH, γ-l-Glu-l-Cys-Gly) or by trypanothione [T(SH)$_2$] (a conjugation of glutathione and the polyamine spermine, i.e., *N1,N8*-bis(glutathionyl)spermidine) [2]. This redox behavior of the metal center is found to affect the geometry of the core of the complex while the geometry transformations, which may take place during this process, may involve (i) the intermolecular interactions, which play an important role in the solid-state arrangement, (ii) the solvation effects, and (iii) the 5s^2 lone pair of electrons located on Sb(III), as well [3]. As the anti-leishmanial activity of Sb(V) has been found to depend on its reduction to Sb(III) inside parasites, it is of importance to investigate the direct influence of Sb(III) [4]. There are few reports in the literature referring to the structural characterization of antimony(III) complexes with ligands containing sulfur donor atoms. Taking into account both the primary and/or the secondary interactions around the antimony(III) cation, Sb(III) complexes with ligands containing sulfur donor atoms were found, thus far, to adopt pseudotrigonal-bipyramidal (ψ-TBP), trigonalpyramidal (TP), trigonalbipyramidal (TBP), square-pyramidal (SP), octahedral (Oh), and pentagonal-pyramidal (PP) geometries (Scheme 1) [5].

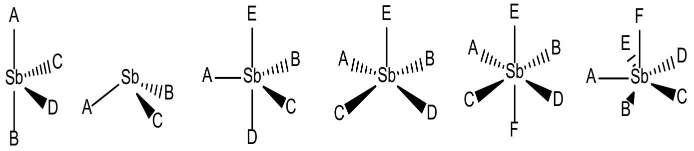

Figure 1: Geometries adopted by antimony(III)-thione complexes

The study of the structural behavior of the complexes derived from the reaction between antimony(III) and ligands containing sulfur donor atoms is a matter of significant importance, both for the investigation of the geometries of the compounds and the factors influencing them and for their use as medicinal drugs or in catalytic processes [6]. In this study, the role of the ligand type of the complex is elucidated.

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Keywords: Coordination Chemistry, Antimony(III) complexes, Ligands, Sulfur Donor Atom

S-A2-006

THE REACTIONS, SPECTROSCOPIC AND STEREOGENIC PROPERTIES OF NO DONOR TYPE MONO-FERROCENYL-CYCLOTETRAPHOSPHAZENES WITH MONODENTATE LIGANDS

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The chlorocyclophosphazenes, $(NPCl_2)_n$, are an important family of inorganic heterocylic ring system. The ring sizes vary from n=3−40. The chlorocyclophosphazenes, $N_3P_3Cl_6$ and $N_4P_4Cl_8$, are the best-known members of chlorocyclophosphazenes and they serve as the starting materials for the rich and attractive chemistry of the phosphazenes [1]. A large number of $N_3P_3Cl_6$ and $N_4P_4Cl_8$derivatives have been prepared with mono- and difunctional ligands [2, 3].

In this study, the reactions of $N_4P_4Cl_8$ (**1**) with an equimolar amount of sodium 3-(N-ferrocenylmethylamino)-1-propan oxide (**2**) produced two kinds of novel products; namely, mono-ferrocenyl-2-*cis*-4-dichloro-ansa- (2,4-ansa; **3**) and mono-ferrocenyl-spiro- (spiro; **4**) hexachloro cyclotetraphosphazenes. The 2,4-ansa (**3**) is the first example of the cyclotetraphosphazene derivatives with the NO donor type bidentate ligands having short chain lenghts, NH-$(CH_2)_3$-O. The 2,4-ansa product (**3**) reacted with excess mono amines (piperidine and DASD) afforded the substituted 2-cis-4-dichlorocyclotetra phosphazenes (**3a** and **3b**). Yet, the fully substituted products were not achieved. Contrast to the reactions of **3**, the reactions of partly substituted *spiro* cyclotetraphosphazene (**4**) with excess mono amines gave the fully substituted mono-ferrocenyl-spiro-cyclotetraphosphazenes (**4a** and **4b**). In these compounds, **3a** and **3b** have two stereogenic P atoms. The structures of the compounds were verified by elemental analyses, MS, FTIR, ^1H, $^{13}C\{^1H\}$, ^{31}P-NMR, HSQC and HMBC techniques.

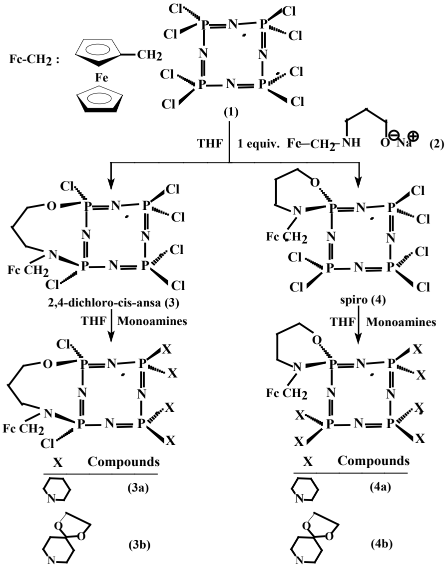

Figure 1: Starting compounds and obtained products.

Acknowledgment: This study is supported by a grant “Scientific and Technical Research Council of Turkey” (Grant No. 215Z496).

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Keywords: Cyclotetraphosphazenes, Spectroscopy, Stereogenism

S-A2-007

THE HEAVY ATOM EFFECT ON THE SINGLET OXYGEN GENERATION OF AXIALLY BODIPY SUBSTITUTED SILICON(IV) PHTHALOCYANINE

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Phthalocyanines (Pcs) are one of the most extensively studied classes of organic functional materials because of their delocalized 18-π electron system which is closely related to that of the naturally occurring porphyrin ring [1]. Phthalocyanine compounds are considered to be ideal candidates for PDT of cancer due to their unique properties such as long wavelength absorption (near IR), capability for efficient singlet oxygen generation and having non-toxic effects in the absence of light [3]. The axially-substituted silicon phthalocyanines (SiPcs) are of great interest to scientists because they do not form aggregates in solution due to their special structural features. Therefore, they are very attractive targets to study of photophysical processes [2]. Boron dipyrromethene (BODIPY) and its derivatives possess a great value in last decade due to their excellent properties [4]. They have widespread applications such as laser dyes in biological sensors owing to their high fluorescence efficiency and photosensitizers in photodynamic therapy (PDT) of cancer due to their high photochemical properties and thermal stabilities [5].

In this study, a novel silicon(IV) phthalocyanine axially substituted with iodinated BODIPY groups were synthesized and characterized. Surprisingly, this phthalocyanine gave purple color in solution due to the mixture of orange and green colors of BODIPY and phthalocyanine units. The singlet oxygen abilities of the silicon(IV) phthalocyanines substituted with non-iodinated and iodinated BODIPY groups were compared. It is observed that the addition of iodine atoms approximately 25 fold increased to the generated singlet oxygen due to heavy atom effect.

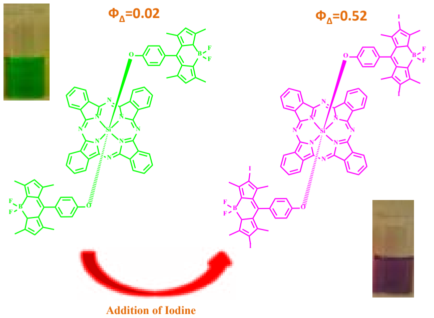

Figure : Axially BODIPY-substituted silicon(IV) phthalocyanines

Acknowledgements: This work was supported by the Scientific and Technological Research Council of Turkey (TUBITAK, Project number: 114Z924)

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Keywords: Bodipy, Silicon(IV) Phthalocyanine,Heavy atom, Photochemical

S-A2-008

THE REACTIONS OF 4-FLUOROBENZYLSPIRO(N/O)CYCLOTRI PHOSPHAZENE WITH MONO AND BIDENTATE LIGANDS: STRUCTURAL CHARACTERIZATIONS AND STEREOGENIC PROPERTIES

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The sequentially bonding of P and N atoms generates an extraordinarily rich variety of inorganic heterocyclic ring systems [1]. The hexachlorocyclotriphosphazene, $N_3P_3Cl_6$, is the best known starting compound of these heterocycles. The complete replacement of the Cl substituents of $N_3P_3Cl_6$ by the excess monodentate and bidentate nucleophiles leads to a variety of fully substituted cyclotriphosphazenes [2]. Recently, there has been a considerable amount of interest in the syntheses of spirocyclotriphosphazenes in general and in the evaluation of the stereogenic properties of chiral cyclotriphosphazenes in particular [3].

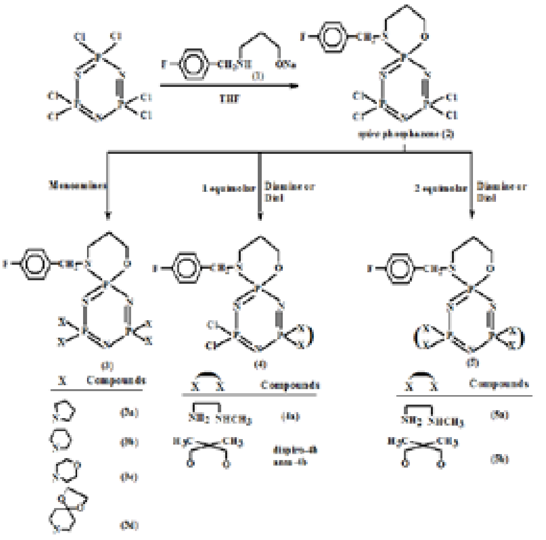

Figure 1: The phosphazene derivatives expected and obtained from the reactions of 4-fluorobenzylspiro(N/O)cyclotriphosphazene with monoamine, diamine and diol.

In this study, the condensation reaction of $N_3P_3Cl_6$ with sodium 3-(4-fluorobenzylamino)-1-propanoxide (**1**) gave partly substituted 4-fluorobenzylspirocyclotriphosphazene (**2**). The Cl replacement reactions of **2** with excess monoamines led to the formation of the 4-fluorobenzylspiro(N/O)tetraamino cyclotriphosphazenes (**3a**-**3d**). The reactions of spirophosphazene (**2**) with the one equimolar and two equimolar amounts of diamine gave both partly substituted **dispiro** (**4a**) and fully substituted **trispiro** (**5a**) diaminophosphazenes. Whereas, the reactions of **2** with the diol resulted in the formation of partly substituted **dispiro-4b** and cis dichloro **ansa-4b**, and fully substituted **trispiro-5b** (Figure 1). The compounds, **dispiro**-**4b** have one stereogenic P-center. In addition, the dispiro compounds (**4a**) and cis dichloro **ansa-4b** have two different chiral P centers.

The compound **4a** and cis dichloro **ansa-4b** are expected to be in racemic and meso forms, respectively. The compound **5a** has two equivalent chiral centers with an unsymmetrical substituted (N/O spiro ring)

P atom. The meso (RS/SR, cis isomer) and two rasemic (RR/SS and RS/SR, trans isomer) forms are likely to be present in the reaction mixture. The structures of all the isolated phosphazene derivatives were elucidated by MS, FTIR, 1D and 2D NMR techniques.

This study is supported by a grant (Project Number: 15H0430005) from Scientific Research Projects (BAP) Committee of Ankara University.

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Keywords: Monofluorobenzylspirocyclotriphosphazenes, Phosphorus-Nitrogen Compounds, Spectroscopy,

S-A2-009

SYNTHESIS AND CHARACTERIZATION OF METALLO PHTHALOCYANINES WITH 2-PYRIDINEETHANOL SUBSTITUENTS

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Phthalocyanines, comprise a remarkably robust and versatile class of chemical compounds. They are of enormous technological importance for the manufacture of blue and green pigments. Other areas of current interest include applications in colours, catalysis, chemical sensors, electrochromism, batteries, photodynamic therapy, semiconductive materials, liquid crystals [1].

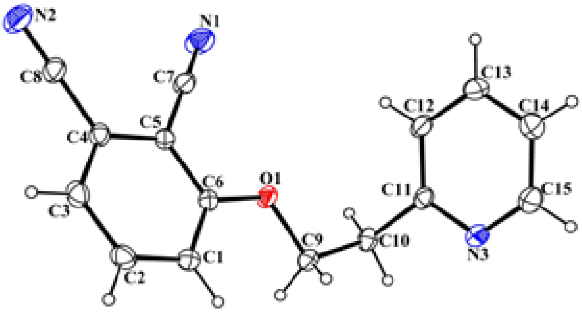

Figure 1: Ortep Diagram of 3-(2-(pyridin-2-yl)ethoxy)phthalonitrile

In this work, compounds 4-(2-(pyridin-2-yl)ethoxy)phthalonitrile and 3-(2-(pyridin-2-yl)ethoxy) phthalonitrile as starting reagents were synthesized via aromatic nucleophilic substitution reactions in order to obtain phthalocyanines containing 2-pyridineethanol unit as substituent groups. Zinc(II) phthalocyaninate compounds were obtained by the treatment of dinitrile derivatives with anhydrous $Zn(CH_3COO)_2$. Structrures of all synthesized compounds were determined by elemental analyses, Uv/vis, ^{1}H-NMR, ^{13}C-NMR, Fluorescence and IR spectroscopy.

Acknowledgements: This work was supported by the research fund of the Amasya University (FMP-BAP 31)

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Keywords: Phthalocyanine, 2-pyridieethanol, phthalonitrile

S-A2-010

ORIGINAL "PUSH-PULL" PHTHALOCYANINES OF AABB AND A_3B-BA_3 TYPE

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Dipolar or "push-pull" chromophores, often exploit a conjugated bridge coupling electron donor and electron acceptor moieties [1-4]. Such chromophores maximize the difference in electric dipole moments of the ground and excited electronic states and minimize the HOMO-LUMO band gap.

Phthalocyanines that are asymmetrically substituted by peripheral and axial substitution are good candidates for third degree nonlinear optics (nonlinear optics) [5-6], for second harmonic generation [7] and solar cells photosensitisers [8] Their immense majority have an AB_3 substitution pattern. However, as far as we could find out, there is not study about semi-symmetric adjacent (of AABB type) phthalocyanines. In these works, push-pull phthalocyanines with an AABB substitution pattern will be presented, as well as push-pull dimeric derivatives A_3BBA_3 (Figure 1). Their spectroscopic properties will be discussed.

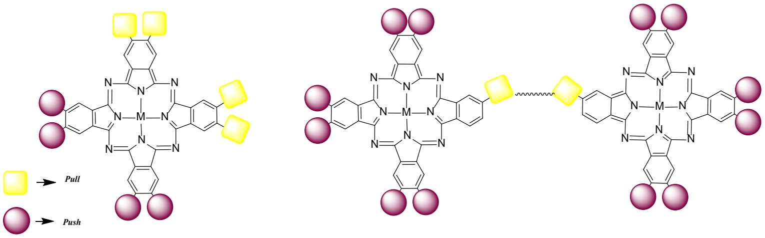

Figure 1: AABB and A_3B-BA_3 type "Push-Pull" Phthalocyanines

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Keywords: Push pull, AABB, Phthalocyanine, A3B-BA3

S-A2-011

AGGREGATION PROPERTIES OF DIMERIC AND TRIMERIC PHTHALOCYANINES LINKED BY SPACERS OF DIFFERENT GEOMETRIES

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Aggregation behavior of phthalocyanines is really important for most of their targeted applications, and led to different physical and chemical properties [1-5]. For these reasons, their possible aggregation must be kept in mind during the design of phthalocyanines for specific purposes.

In order to better investigate the aggregation issues of multimeric derivatives, dimeric and trimeric pthalocyanines were synthesized using different spacers [6,7] (Figure 1): catechol, resorcinol, *tert*-butyl catechol, phloroglucinol ve monoethylene glycol. In this design, the additional large volume effect, geometry effect, rigid character effect and number of phthalocyanines (monomer, dimer, trimer) effect have been investigated to determine their aggregation properties.

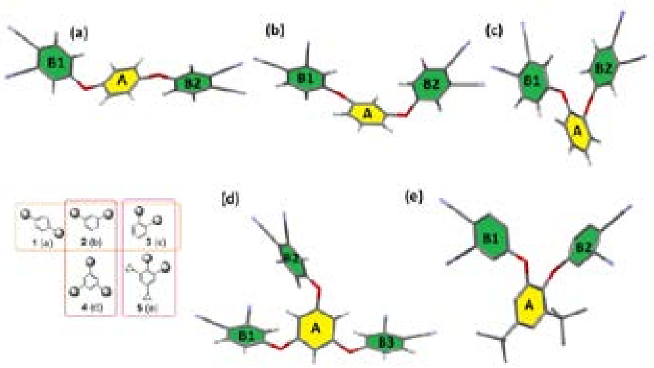

Figure 1: Structures of synthesized dimer and trimer phthalonitriles.

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Keywords: Phthalocyanine, aggregation, dimeric, trimeric

S-A2-012

PHTHALOCYANINE - RESORCINARENE CAVITAND HYBRIDS: DESIGN, SYNTHESIS AND HOST-GUEST INTERACTIONS WITH FULLERENE DERIVATIVES

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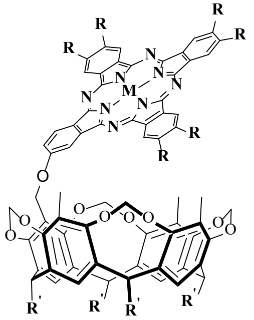
During the past decades, construction of supramolecular functional systems consisting of functional molecular components have gained interest among scientists [1,2]. There are several fluorescent cavitands in the literature and their host-guest interactions using different guest molecules have been investigated. It is shown from UV-vis and fluorescence measurements that fluorescent cavitands hosts non-covalent recognition of guest molecules [3,4].

Phthalocyanines are synthetic tetrapyrrolic compounds, are extensively used as electron-donor molecules for preparation of donor-acceptor dyads and polyads (triads, tetrads, etc.), thanks to their strong absorption, emission and redox properties [5].

Resorcinarenes are a type of cavitand molecules. They are versatile frameworks which can act as molecular hosts for guest molecules [6]. Resorcinarene-phthalocyanine dyads are reported in the literature to form supramolecular structures or covalent hybrids. The versatility of these hybrids allows them to be used in many possible applications like molecular recognition, energy and/or electron transfer enhancement, specific encapsulation or solar light harvesting [7]

In this work, a resorcinarene-phthalocyanine hybrid will be prepared to be used to enhance energy and electron transfer via host-guest interactions with fullerenes.



R: H, $-SC_3H_7$, $-SO_2C_3H_7$
R': C_5H_{11}

Figure 1: Phthalocyanine-resorcinarene cavitand hybrids.

Acknowledgements: The Scientific and Technological Research Council of Turkey (TUBITAK) is gratefully acknowledged for the funding of these studies (project 114Z590).

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Keywords: Phthalocyanine, Resorcinarene, Cavitand, Hybrid, Host-Guest, Fullerene

S-A2-013

TETRAETHYLENE GLYCOL-SUBSTITUTED Zn PHTHALOCYANINE DESIGNED FOR NAKED-EYE OBSERVATIONS OF ACIDIC MEDIUM

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Since they are acid sensitive, the protonation of phthalocyanine's azomethine nitrogen atoms modifies their spectroscopic properties. UV or fluorescence based acidic sensing measurements are quite common [1,2,3].

In this work we designed a system with an organosoluble phthalocyanine substituted by four *tert*-butyldimethylsilylated tetraethyleneglycol chains. This phthalocyanine becomes water-soluble upon the acid-promoted removal of the TBDMS moieties. For this aim three different strong acids that ionize totally in water were selected: perchloric acid, hydrochloric acid and trifluoroacetic acid. An effect of the nature of the acid was determined and attributed to the conjugated base of the acid employed affecting the interaction of phthalocyanine with acids. The relevance of our naked-eye observation system design was confirmed [4]. This system could unfortunately not be used for the naked-eye detection of fluoride anions in water, even if silylated functions are known to have strong affinity for this anion.

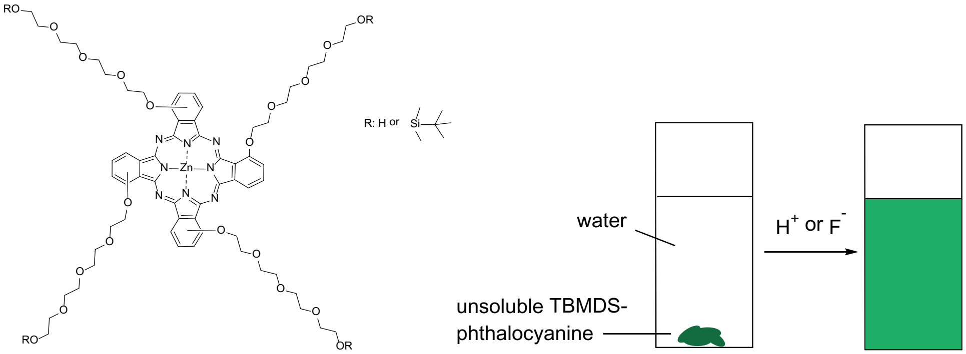

Figure 1: Presentation of the concept of naked-eye visualization of acidity.

References:

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Keywords: Phthalocyanine, silyl, TBDMS, acid sensitivity, fluoride anion sensitivity.

S-A2-014

COORDINATION MODES OF THIOSEMICARBAZONES BASED ON SUBSTITUE SALICYLALDEHYDE AND TRIPHENYLPHOSPHINE

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The synthesis of metal complexes bearing a phosphine ligand with generally stability and reactivity is still one of essential research topic [1]. Metal-phosphine complexes have a second ligand that contains both soft and hard donor atoms [2]. These ligands are preferred a special significance due to their biological potentials. Thiosemicarbazones take on a great importance as a ligand because of biological, medicinal, pharmacological and analytical properties [3]. Thiosemicarbazones possess different coordination modes, can be in neutral or anionic form because of thione–thiol tautomerism and give generally neutral or rarely cationic metal complexes [4]. Their properties and coordination behaviors change depending on metal atom, connected aldehyde or ketone and substituents on aldehyde/ketone [5-6].

In this study, we investigated coordination behaviors of all possible donor atoms of substitue salicylaldehyde thiosemicarbazone to nickel(II) site. For this aim, we synthesized four different ligands of salicylaldehyde thiosemicarbazone backbone (**L**$^{1-4}$) and their five nickel(II) complexes (**1**-**5**) with triphenylphosphine. The different coordination behaviors of thiosemicarbazones having more donor atoms than one were shown. The compounds were characterized by elemental analysis, IR, ^{1}H-NMR and UV-Vis. spectroscopies. The molecular structures of the complexes were also determined by single crystal X-ray diffraction technique.

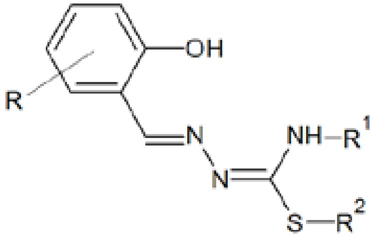

Figure 1: The dibasic thiosemicarbazone ligands. R^1/R^2: CH_3/CH_3 (**L**$^1H_2$), CH_3/H (**L**$^2H_2$), H/CH_3 (**L**$^3H_2$), H/H (**L**$^4H_2$).

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Keywords: Thiosemicarbazone, Nickel, Triphenylphosphine, Coordination mode, X-ray crystallography

S-A2-015

SYNTHESES AND STRUCTURAL CHARACTERIZATION OF FIRST PARABEN SUBSTITUTED FERROCENIL PHOSPHAZENE COMPOUNDS

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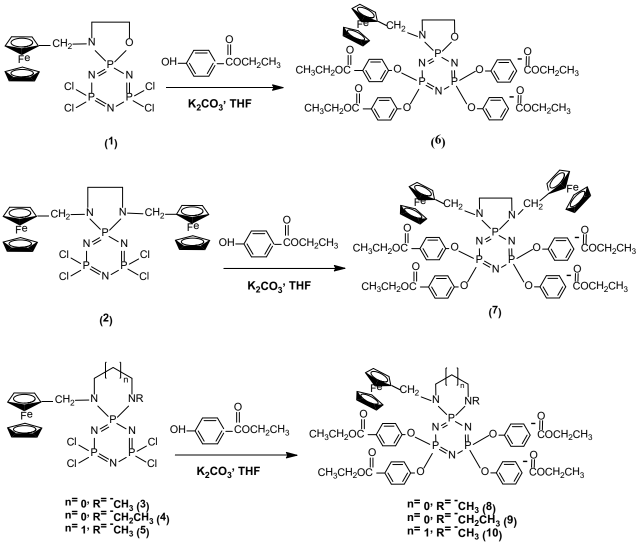
Parabens have been considered as a side group to enhance antimicrobial and cytotoxic activities and DNA interactions of ferrocenyl phosphazenes [1-4]. For this reason, the paraben substituted cyclotriphosphazene compounds have been synthesized (6-10) (Scheme 1) and their structures have been determined using elemental analysis, Fourier transform (FTIR), one-dimensional (1D) ^{1}H, ^{13}C, and ^{31}P NMR techniques. The molecular and solid-state structures of 9 and 10 were established using single crystal X-ray diffraction methods.



Scheme 1 The phosphazene derivatives obtained from the reactions of tetrachloroferrocenylphosphazenes with paraben derivative (ethyl-4-hydroxybenzoate)

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Keywords: Ethyl-4-hydroxybenzoate, Ferrocenylphosphazenes, Paraben, Spectroscopy

S-A2-016

N_2O_2 CHELATE COMPLEXES OF OXOVANADIUM(IV): COMPARISON AND STRUCTURAL INVESTIGATION

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Vanadium is a very important metal ion in the world, because it is a nutrient in trace amounts and is toxic at higher concentrations, thus having a dual phsiological effect. Vanadium is present at very low levels, therefore the analytical methods to find its concentration must be highly sensitive in order to be measured reliably [1].Vanadium thiosemicarbazone complexes have long been known to have potential anticancer activity toward kidney tumor cells in vitro. In a study, some oxidovanadium(IV) complexes were reported to interact with DNA through intercalative mode and can efficiently cleave the plasmid pBR322 DNA [2].

Nitrogen-fixing bacteria must acquire molybdenum or vanadium (with some iron) in order to form the nitrogenase structure. Since Mo and V are important metal ions, they were investigated in the acquisition mechanism by *Azotobacter vinelandii* and several siderophores were investigated [3]. The antitumoral and insulin-mimetic properties of vanadium-bearing complexes have increased the number of publications in the literature. Physicochemical characterization of vanadium can be studied by researching the inorganic pharmacology of them. Oxovanadium(IV) complexes were synthesized containing ONS; N_2O, N_2O_2, and S_2O_2 donor ligands[4]. Administration of vanadium(IV)oxide-ligand complexes to the diabetic rats rendered diabetic, has had a significant effect over diabetes mellitus by regenerating the B cells of the pancreas [5].

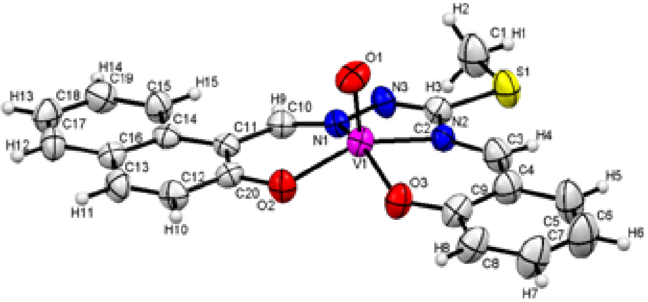

Figure 1. Crystal structure of oxovanadium(IV) template

S-alkylthiosemicarbazone-based oxovanadium(IV) template was synthesized and characterizations were performed, including elemental analyses, FT-IR, UV-Vis, ^{1}H-NMR and electron paramagnetic resonance (EPR) [4]. In this study, X-ray structure of oxovanadium(IV) template was obtained by slow evaporation in ethanol solution at room temparature. Template is crystallized in the monoclinic space group P-1 with Z= 4. Recently obtained crystal structure was compared with the literature.

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Keywords: Vanadium, Thiosemicarbazone, X-ray structure,Template

S-A2-017

IONIC LIQUIDS WITH ALUMINATE AND BORATE BASED WEAKLY COORDINATING ANIONS

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Ionic Liquids (ILs) are generally defined as salts with melting points below 100 °C. In recent years, ILs aroused large interest due to their advantages over conventional solvents such as extremely low vapor pressures, non-flammability, interesting transport and electrochemical properties. Unique properties of ILs are leading to potential use in a wide range of applications, e.g. as reaction media, as electrolytes in batteries and super capacitors, in solar and fuel cells, as additives for stabilizing proteins, in catalysis and nanoscience [1]. In general, weaker anion-cation interactions lead to low melting salts with lower viscosities and higher conductivities [2]. The strength of the anion-cation interactions is correlated to some extent with the coordination ability and Lewis basicity of the anion [3b]. Thus, weakly coordinating anions (WCA's) are good candidates for the synthesis of new salts with lower melting points and optimized physical properties.

ILs with Alkoxyaluminate and Alkoxyborate Anions

It's well-known that $[Al(OCH(CF_3)_2)_4]^-$ is a symmetrical and weakly coordinating anion which has been used to stabilize reactive cations [3]. We could synthesise a series of ILs with this anion and study their physical properties [4]. In addition to low melting temperatures they offer low viscosities (down to 38 cP), high conductivities, good electrochemical stabilities, good hydrogen solubilities and high polarities. The measured statistic dielectric constants were much higher than expected. To understand this phenomenon NMR investigations and DFT calculations were carried out. Investigation in context of Walden rule was also made.

A disadvantage of the aluminate anion is its water sensitivity. A homologous anion with boron as central atom was prepared and used for the synthesis of new ILs. The salts with this anion is stable against water, because B-–O bonds are shorter and less polar than Al-–O bonds [5].

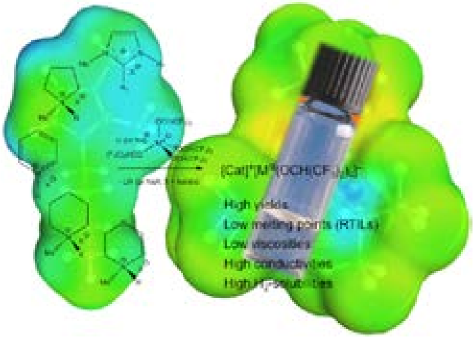

Figure 1: Synthesis of ILs with Alkoxyaluminate and Alkoxyborate Anions $[M^{III}(OCH(CF_3)_2)_4]^-$ (M = Al, B)

References:

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Keywords: Ionic liquids, alkoxyaluminate, alkoxyborate

S-A5-001

THE EFFECT OF THE IONIC LIQUIDS ON THE DISSOLUTION OF COAL IN AN ORGANIC SOLVENT

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Ionic liquids (ILs) have been used widely as novel green solvents. It has been reported that some imidazole ionic liquids (ILs), such as [Bmim][Cl] could swell and partially fragment coal [1,2]. In this work, the solvent extraction of two Turkish coals were carried out by N-methyl-2-pyrrolidone (NMP) and its ionic liquid mixtures at mild conditions. The effects of extraction temperature, coal type, time, ionic liquid type, and ionic liquid-to-coal ratio on extract yield were investigated. The extraction yield of coals was found dependent on temperature, coal, ionic liquids type and amount of ionic liquids. It was founded that 1-butyl-3-methyl-imidazolium chloride was a more efficient solvent for the extraction lignite compared to the others ionic liquid used. Ionic liquids were effective on the extraction of Afsin-Elbistan lignite, but other side they were not effective on the extraction of Uzulmez coal. Significant increases in extraction yields for Afsin-Elbistan lignite were observed when adding a small amount of ionic liquid into NMP. When only NMP was used as solvent, Uzulmez coal gave lower extraction yield (less than 4%) at lower temperatures, but it gave higher extraction yield at high temperatures such as 200-202 °C.

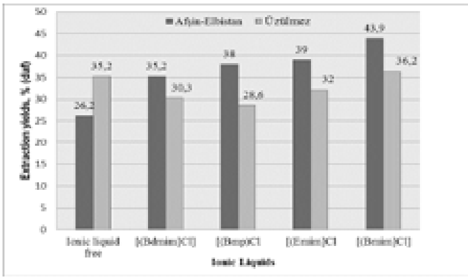

Figure 1. The effects of ionic liquids on the extraction yields in NMP

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Keywords: coal, ionic liquids, solvent extraction, NMP

S-A5-002

SOLVENT EXTRACTION OF ZONGULDAK COAL BY 1-METHYLNAPTHALANE

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There are abundant coal resources in Turkey, but many of these resources are not used because of their high content of moisture, mineral matter, and organic oxygen, resulting in low calorific value and causing high pollution from their burning. On the other hand, the abundance of valuable organic components, including aromatic and aliphatic chemicals, makes coals attractive raw materials for the production of value-added products [1-3]. Solvent extraction of coal aims to obtain liquid or solvent soluble molecules from coal. Many extraction methods, such as soxhlet, supercritical fluid extraction pressurized liquid extraction and ultrasonic-assisted extraction have been performed to the coal [4]. In this work, Zonguldak coal was extracted with 1-methylnapthalane (1-MN) at boiling point of 1-MN under atmospheric pressure. Also, the experiments were performed using 1-MN/N-methyl-2-pyrrolidinone (NMP), 1-MN/quinoline (QN) and 1-MN/ionic liquids mixed solvents under same conditions. 1-butyl-3-methylimidazolium chloride (BMIM) and 1-ethyl-3-methylimidazolium chloride (EMIM) were used as ionic liquids. Extraction yield of Zonguldak coal in 1-MN enhanced by addition of a little NMP and QN, but ionic liquids were not effective for extraction yield of Zonguldak coal.

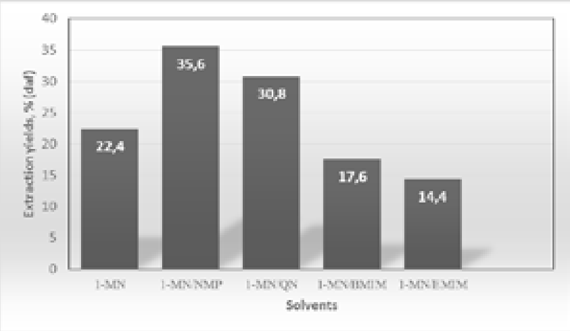

Figure 1. The extraction yields of Zonguldak coal in different solvents system

Acknowledgements: The authors thank the Research Fund of Mersin University in Turkey with Project Number: 2015-TP2-1303.

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Keywords: coal, ionic liquids, solvent extraction, 1-methylnapthalane

S-A5-003

APPLICATIONS OF POLY(LACTIC ACID) AND BLENDS IN MEMBRANE AND PACKAGING FIELDS

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Poly(lactic acid) (PLA) is a green polyester which is most commonly used currently among bioplastics in the market . PLA is derived from lactic acid which is produced by fermentation using microorganisms. PLA displays low barrier properties compared with conventional polymers. Figure 1 shows percent transmission of PLA against polystyrene (PS), low density polyethylene (LDPE), polyethylene terephthalate (PET) and cellophane films [1].

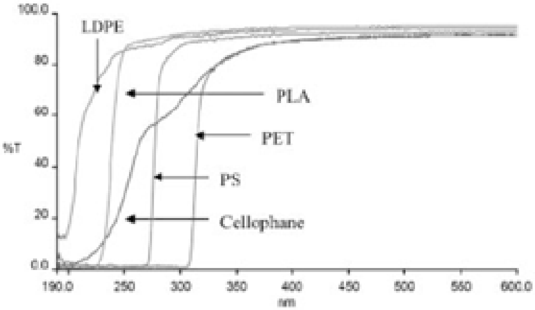

Figure 1: Percent transmission versus wavelength for PLA, PS, LDPE, PET and cellophane films [1]

To improve poor properties of PLA, lactic acid polymerizes with other monomers to synthesize copolymers or preparing PLA blend with other synthetic and biodegrable polymers. PLA has been used as mulching films, biomedical devices and packaging materials [2]. The blending of hydrophobic polymers with hydrophilic polymers has been widely applied to increase the hydrophilicity of membrane surfaces and enhance anti-fouling properties. PLA can be used in hollow fiber membranes with polyethylene glycol (PEG)-PLA copolymers to decrease fouling properties of membranes

In this study, blends of PLA with synthetic polymers such as recycling PE and biodegradable polymers (cellulose acetate and starch) were prepared and determined film properties to investigate using as membrane and packaging material. Physical, mechanical and thermal properties of PLA and PLA blends were measured with GPC, Tensile test machine, DSC and TGA.

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Keywords: poly(lactic acid), polyethylene, cellulose acetate, starch, membrane, packaging

S-A5-004

PHYSICAL PROPERTIES OF BENZETHONIUM CHLORIDE BASED DEEP EUTECTIC SOLVENTS

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Deep eutectic solvents (DES) are type of ionic solvents composed of two components and have a lower melting point of either of the individual components. DES's can be prepared combining with a hydrogen bond donor (HBD) (amides, carboxylic acids) and hydrogen bond acceptor (HBA) (quaternary ammonium salts).

In this study, physical properties of DESs based on Benzethonium Chloride as HBA and p-toluene sulfonic acid, citric acid and oxalic acid as HBD were investigated at their respective eutectic points. Refractive index, conductivity, density, viscosity and pH were investigated for all the DESs between 293.15 to 333.15 K. Obtained results were in line with the expectations and literature. As expected density, refractive index and viscosity decreased and ionic conductivity increased with increasing temperature whereas pH values remain stable. Obtained results showed high potential of DESs both for solvent and catalyst applications.

Acknowledgements: This study was supported by TUBITAK (213 M 643) Scientific Research Project.

Keywords: DES, Deep Eutectic Solvent, Benzethonium Chloride, oxalic acid, p-toluene sulfonic acid, citric acid

S-A5-005

PHYSICAL PROPERTIES OF CHOLINE CHLORIDE – CITRIC ACID BASED DEEP EUTECTIC SOLVENT AND ITS CATALYTIC EMPLOYMENT IN THE ESTERIFICATION REACTIONS

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In recent years, deep eutectic solvents (DES) emerged as an alternative and analogue to the ionic liquids. Deep eutectic solvents are type of ionic solvents compromised of two components which have a lower melting point of either of the individual components. DESs can be prepared combining a hydrogen bond donor (HBD) (amides, carboxylic acids) with a hydrogen bond acceptor (HBA) (quaternary ammonium salts). In this study, DES composed of choline chloride as HBA and citric acid as HBD was prepared. Physical properties of DES were investigated. Refractive index, conductivity, density, viscosity and pH values were measured between 293.15 to 333.15 K. Results were aligned with expectations; density, refractive index and viscosity decreased and ionic conductivity increased with increasing temperature whereas pH values remain stable.

Second part of the study focused on the catalytic employment of DES on the esterification of acetic acid with butanol. The catalytic performance of the DES on the esterification reaction between acetic acid and n-butanol is investigated at three different temperatures of 353, 358 and 363 K. Results showed that DESs have desirable properties to be employed in the liquid phase esterification reactions as catalyst.

***Acknowledgements**:* This study was supported by TUBITAK (213 M 643) Scientific Research Project.

Keywords: Deep Eutectic Solvent, Esterification, Citric Acid, Choline Chloride, Butanol

S-A5-006

GREEN CHEMISTRY APPLICATIONS IN ENERGY PRODUCTION

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Green chemistry applications have getting more importance than earlier. Fossil fuel sources is dangerous for environment and human health. Green chemistry is defining that; the utilization of a set of principles that will help to reduce the use and generation of hazardous substances during the manufacture and application of chemical products [1].

Fuel is a chemical product and it can be produce with green chemistry applications. Biomass conversion technology [2], Refuse Derived Fuel (RDF) [3], Waste to Energy [4] are all area of green chemistry applications.

Green chemistry applications in energy production will be the an important actor for better world.

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Keywords: Biomass, Green Chemistry, RDF, Waste

S-A5-007

INVESTIGATION OF EFFICIENCY OF "I PROTECT THE ENVIRONMENT WITH GREEN CHEMISTRY" ENTITLED TUBITAK-4004 NATURE AND SCIENCE SCHOOLS PROJECT

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Green chemistry is a new branch of science that emerges by the environmental pollution and aims to protect the environment. Green chemistry covers the preventive methods which protect the environment and human health from the hazardous chemical products [1-3]. The aim of this project is to provide environmental education for children via green chemistry. For this purpose, recycling, energy saving, natural chemicals and harmful chemicals will be taught to the children for their awareness. The target group of the project has been determined as 35 children aged 5-6 who attend Gonca Kindergarten, and their parents living in Keçiborlu, Isparta. In the project, involvement of the families will be provided and the sustainability of the training will be ensured. During the education process experimental and control groups will be used. Before the education start a Pre-test will be applied to the attendees to determine their awareness on the subject. Another test will be applied after the completion of the program to determine the outcomes of the education. To test the permanency of the knowledge gained from the given education a final test will also be applied to the attendees. The project activities will be given to children and their families by the experienced instructors and mentors by using different teaching methods in various places such as forest, rose gardens and outdoors. In the project, attentions of the children and families will be drawn by encouraging them to ask questions, and by actively joining the tutorial activities. At the end of the project, the children, their parents and their teachers are expected to gain positive attitudes and awareness towards the environment with environmentally friendly green chemistry applications. Preschool education enables taking permanent steps towards sustainable development, which has become widespread in recent years, and whose importance continues to increase. There is a need for studies that establish environmental awareness and support sustainable development, especially in developing countries, such as Turkey. In this study, the results of the applications of the project will be discussed.

Acknowledgements: The authors thank to TUBITAK (Project no: 116B340) for the financial support of this work.

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Keywords: Green Chemistry, Environmental Education, Preschool Children, Environmental Pollution

S-A5-008

THE CHARACTERIZATION AND GREEN SYNTHESIS OF GOLD NANOPARTICLES USING KARAHINDIBA PLANT *(Taraxacum Officinale)* EXTRACT

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Metal nanoparticles have unusual some physicochemical properties and biological activities compared to the other materials. Various physical, chemical and biological methods are used to synthesize gold nanoparticles. In this study, it is aimed to synthesize gold nanoparticles by environmentally friendly methods using the extract of common dandelion plant (*Taraxacum officinale*), which is growing between April and May. In the biosynthesis studies, it is investigated the effects of solid-liquid ratio, temperature and initial pH on the synthesis of Au nanoparticles. The results showed that the biosynthesized Ag nanoparticles behaved the characteristic absorbance were obtained at 460 nm. From XRD analysis, AFM and FESEM images results showed that the silver nanoparticles have composed of crystalline structures. It could be supposed that the dominant reaction mechanism attributed to the multiple bonds compounds from FTIR analysis. It was determined that *Taraxacum officinale* could be used as reductant material for Au nanoparticles.

Keywords: Karahindiba (Taraxacum officinale) fruit, extract, Gold Nanoparticles, Green Chemistry, and Biosynthesis.

S-A5-009

THE CHARACTERIZATION AND BIOSYNTHESIS OF SILVER NANOPARTICLES USING DAĞDAĞAN FRUIT EXTRACT *(Celtis Tournefortii L.)*

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Metal nanoparticles, particularly in textiles, medicine, optics, electronics and paint, are implicated in various industries. In order to synthesize metal nanoparticles are used various methods, however, physical and chemical methods cause secondary pollution for the environment except for biological method. In this study, it was aimed to synthesis the silver nanoparticles by the environmental friendly method using the Dagdagan(*Celtis Tournefortii L.*) fruit extract, which is grown in Erzincan called as dahan, çitemik, çıtlık, is yellowish-red during March -April months. In the experiments, the effects of solid-liquid ratio and pH on the biosynthesis of silver nanoparticles would be examined. The results showed that the biosynthesized Ag nanoparticles behaved the characteristic absorbance peak by the Surface Plasmon Response using UV-Vis spectrophotometer at 460 nm. XRD analysis results showed that the silver nanoparticles have face-centered cubic structures. The atomic force microscopy and FESEM images depicted that the aggregated structures had a great numbers and supposed that the dominant reaction mechanism attributed to the amide I (phenolic compounds) from FTIR analysis. EDX analysis depicted that the Ag nanoparticles at L atomic-shell were revealed by biosynthesis using the *celtis tournefortii L.*.

Keywords: Dağdağan (Celtis Tournefort L.) fruit extract, Silver Nanoparticles, Green Chemistry, and Biosynthesis.

S-B1-001

EFFECT OF DIMENSIONALITY AND THE POLYMORPHISM ON THE PROPERTIES OF ZnO

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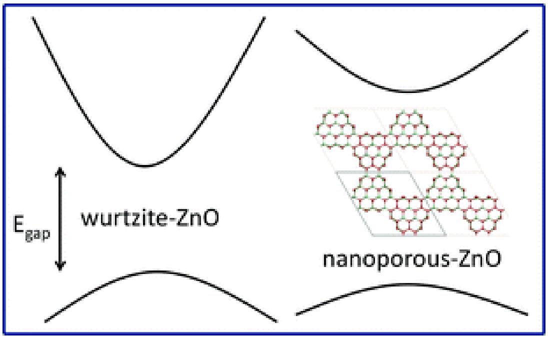
The tremendous success of solid-state device technologies is underpinned by our understanding of semiconductor physics and driven by our ever increasing ability to adapt and optimize the properties of such materials. This interplay between fundamental and applied approaches to materials research is well illustrated by the ongoing rapid development of the wide band gap (Egap) semiconductor zinc oxide (ZnO) for a variety of applications such as ultraviolet (UV) optoelectronics, solar cells and (bio) chemical sensors. Size reduction of inorganic materials to the nanoscale often induces polymorphism, alternative atomic ordering relative to the most stable bulk crystal, which is of crucial importance as polymorphs can and often do show significant differences in chemical and physical properties.

In this study, we considered a wide range of ZnO polymorphs either by generation inspired by enumeration of their characteristic underlying nets or by mining databases containing 4-connected nets. Evaluating the bulk and nanofilm stabilities of these structures with ab initio calculations allows for an unprecedented overview of polymorphism in wurtzite materials. We find a rich low energy nanofilm polymorphism with a totally distinct stability ordering to that in the bulk. From this general basis we provide new insights into structural transitions observed during epitaxial growth and predictions for nanofilm stability with varying strain or thickness. Furthermore, by using many body GW and density functional based calculations we probed how the band gap is affected by nanoporosity in bulk polymorphism. Within a reasonable range of energetic stability, we predict that nanoporosity can induce band gap increases of up to ∼1.5 eV relative to wurtzite ZnO. Our results further imply that structural stability and band gap increase are fundamentally linked to pore system dimensionality. We suggest that nanoporosity could be employed as a general band gap engineering method for morphologically and electronically tailored functional materials.



Keywords: Polymorphism, bandgap engineering, nanoporosity, stability crossover

S-B1-002

A DFT STUDY OF FREE AND SUPPORTED Au-Rh NANOALLOYS

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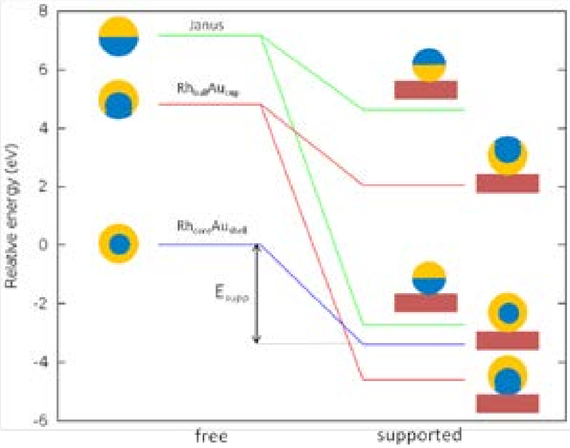
Density functional theory calculations were performed on both free and TiO_2(110)- supported 38- and 79-atom truncated octahedron Au-Rh nanoalloy clusters at various compositions to investigate Au-Rh alloying properties at the nanoscale and the influence of the support. Furthermore, H_2, O_2, and CO adsorption properties were also investigated with a view to estimating and optimizing the catalytic performance of Au-Rh nanoalloy systems. Among the structures studied, the $Rh_{core}Au_{shell}$ morphology was found to be the lowest energy structure for bare clusters, while molecular adsorption energies are greatest on surface Rh atoms. It is shown that multiple CO and O_2 adsorption can change the stability order of nanoalloy clusters selectively. For example upon adsorption of 6 molecules of CO (or O_2) the centroid (or hex) structure, which has 6 surface Rh atoms, becomes the lowest energy structure for the $Au_{32}Rh_6$ composition. It is also shown that Janus type clusters become more competitive to the $Rh_{core}Au_{shell}$ on the TiO_2(110)- support due to the surface induced stabilisation.



Keywords: Nanoalloys, Au-Rh, supported clusters

S-B1-003

SELF-ASSEMBLED GLYCO-NANOPARTICLES FOR DRUG DELIVERY PLATFORM

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Glycosylation is one of the most common forms of co- and post-translational modifications, with over 50% of all proteins carrying various carbohydrate structures. [1] An increased delivery of therapeutic/imaging agents can be achieved by "active" targeting using ligands specific for the receptors on the cellular membranes of the diseased tissue. When the nanoparticles concentrate inside the tumor tissue via the enhanced permeability and retention (EPR) effect, the receptor-mediated internalization of particles by cells through the actively targeting ligands present on the surface of the particles will facilitate the uptake. As the ideal result, the residence at the site of action of the therapeutic agent will be prolonged, leading to an enhanced therapeutic efficiency and decreased side-effects. Sugars, peptides, vitamins, lectins, growth factors, or antibodies are the most commonly employed actively targeting ligands.

Out of these ligands, carbohydrates offer the highest stability toward environmental changes, such as variation in pH, temperature, salt concentration as well as oxidative stress. The combination of physical properties (size, shape, charge) with bioactive targeting motifs on the surface of nanoparticles should result in the development of systems, which deliver a drug precisely and safely to its site of action.

Glycopolymers, synthetic polymers carrying pendant sugar units, have been shown to target carbohydrate receptors on cancer cells. [2-5] Due to multimeric representation of targeting ligands, the glycopolymers exhibit much higher affinities than the monomeric ligands.

In this work, we report the synthesis of fluorescent, amphiphilic glycopolymers (Scheme 1), their self-assembly into nanosized aggregates with differnt morphologies, and their carbohydrate-dependent internalization by various cell lines.

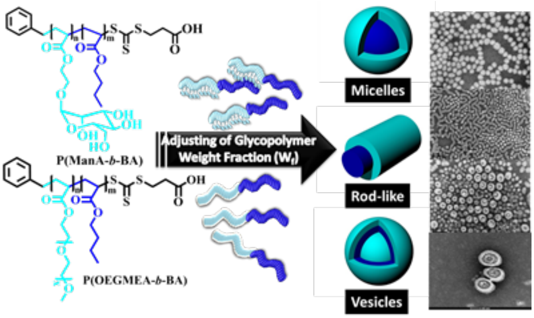

Figure 1: Synthetic pathway for the preparation of glyco-nanoparticles with different morphologies

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Keywords: glyco-nanoparticles, drug delivery, self-assembly

S-B1-004

DOUBLE SURFACE MODIFICATION OF VARIOUS CARBON NANOTUBES

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Started from introducing of carbon nanotubes by Iijima [1], they have speedily turned into an interdiciplinary field on account of showing their superior structural, mechanical, electrical, and electromechanical features. These features increase the usage of carbon nanotubes (CNTs) in many science and engineering areas such as sensoring, nerve cell stimuli, drug delivery, cancer therapy. However, major limitation for application of CNTs is their poor solubility, dispersion, processibility and self aggregation. Hence, functionalization of CNTs is necessary. For this purpose some methods have been reported such as non-covalent functionalization (π-π stacking interactons) and covalent functionalizations (Diels-Alder reaction, nitrene addition or thiol-ene click reaction).

This study highlights the application of the Diels-Alder [2] and thiol-ene [3] reactions to perform double click strategy to multiwalled (MWCNTs) and singlewalled carbon nanotubes (SWCNTs) for surface modification.

For this purpose, well-defined α-anthracene-, α-maleimide-, α-azide and α-thiol-terminated various polymers were prepared by using several controlled/"living" radical polymerization methods. Secondly, one of the well-defined α-anthracene- and α-maleimide-terminated polymers or small molecules clicked (via Diels-Alder reaction) to CNTs' surface by using "grafting-to" method at reflux temperature of toluene [4]. Finally, obtaining CNTs double clicked with α-thiol polymer or α-azide polymer [5].

The homopolymer precursors characterized by using the GPC, NMR and UV analysis. Furthermore, characterization of CNTs will be made by using TGA, FT-IR.

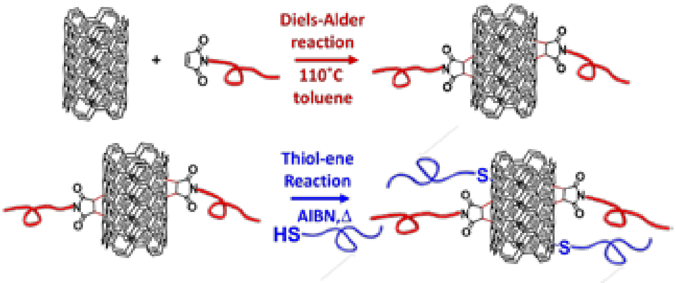

Figure 1: The suggested way to obtain double clicked CNTs

Acknowledgements: Authors appreciate to Bayer MaterialScience AG for providing carbon nanotubes used in this work.

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Keywords: carbon nanotubes, polymer, double modification

S-B1-005

HIGHLY SENSITIVE CHEMIRESISTIVE SENSORS WITH THE USAGE OF CONDUCTIVE POLYMER NANOTUBES

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Conductive Polymers (CP) has been one of the most attractive and studied topics of the research world because of their very suitable properties for numerous applications. In this study, we are planning to use a conductive polymer Polypyrrole for detection of volatile organic compounds. This sensor system has high potential for the early diagnosis purposes.

Conductive Polymers (CP) has been one of the most attractive topics of the research world from their discovery in mid-1970s. This class of materials have wide application areas such as artificial muscle [1], supercapacitors [2], drug delivery [3] electrochemical sensor [4]. Polypyrrole (PPy) among the conductive polymers has special place because of its high stability, good biocompatibility [5] and relatively high conductivity.

In our study, oCVD vapor phase deposition technique is used for production of Polypyrrole Nanotubes. With the low energy input need, processability at room temperature, highly-conformal deposition ability, applicability for unlimited samples from conductive to non-conductive, ordinary flat glass slide to samples with a very complex geometry on its surface these vapor phase depositions methods are suitable and quite promising instruments for advancing polymer thin film and polymeric materials development.

In order to production of Polypyrrole nanotubes, hard template method conducted by using AAO template with 200nm and 100 nm openings. After the studies on Polypyrrole conductivity, thickness and nanotube formation optimizations. During the polymerization of the pyrrole, antimony (V) chloride is used as dopant. After nanotube production is completed, SEM, FTIR and 4-probe measurement is being used for morphological analysis, chemical analysis, conductivity measurement respectively.

After these studies completed, polypyrrole nanotube embedded sensor system is being used for detection of volatile organic compounds in first step with high selectivity and sensitivity. There are some similar researches on this field which has already being conducted, however electropolymerisation on a conductive substrate has been used most of these studies and it is known that in sensor application, sensitivity can be enhanced by using insulator substrate. In order to obtain a suitable sensor design we also aim to use some biomimetic geometry and hybrid material systems in the design of our system. To the best of our knowledge it has not been studied yet.

Early diagnosing of health problems especially cancer in virtue of volatile biomarkers is a widely studied subject of today's world.[6] Usage of our candiate system has high potential to be utilized in early diagnosis of health problems by detection of volatile organic compounds which are the markers of some disease.

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Keywords: Nanotechnology, Chemiresistive Sensors, Polypyrrole Nanotubes, Vapor Phase Deposition

S-B1-006

ICG-CONJUGATED MAGNETIC GRAPHENE OXIDE FOR DUAL PHOTOTHERMAL AND PHOTODYNAMIC THERAPY

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Aptamer-functionalized magnetic graphene oxide conjugates loaded with indocyanine green (ICG) dye, or Apt@ICG@mGO, have been successfully developed for dual-targeted photothermal and photodynamic therapy. In general, a drug or its carrier or their dosage can be important issues in terms of toxicity. However, in this system, each component used is quite safe, biocompatible and clean. For instance, ICG, a Food and Drug Administration (FDA) approved near-infrared (NIR) dye, serves as both a photothermal and photodynamic agent. It is immobilized on the surface of mGO via a physical interaction called "p–p stacking". The mGO, as a most biocompatible member of the carbo family, is selected for use as a platform for aptamer and ICG dye conjugation, as well as a photothermal agent. The light in the nearinfrared region (NIR) was chosen as a harmless light source for activating the agents for photothermal therapy (PTT) and photodynamic therapy (PDT). The magnetic properties of mGO are also used for separation of Apt@ICG@mGO conjugates from the reaction medium. Aptamer sgc8 acts as a targeting ligand to selectively and specifically bind to a protein on the membrane of cancer cell line CCRF-CEM. After the aptamer-functionalized ICG@mGO conjugates are incubated with target CEM cells at 37˚C for 2 hours, they are bound to cells or they may be internalized into the cell via endocytosis. More significantly, we demonstrated that the Apt@ICG@mGO conjugates produce heat for photothermal therapy (PTT) and singlet oxygen for photodynamic therapy (PDT) upon NIR laser irradiation at 808 nm. Thus, remarkably efficient cancer cell destructions with _41% and _60% and _82% cell killing using 10, 50 and 100 ppm Apt@ICG@mGO, respectively are achieved in 5 min light exposure.

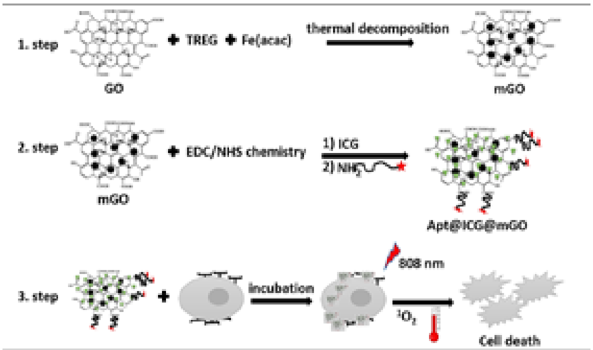

Figure 1: Schematic illustration of synthesis of mGO, Apt@ICG@mGO and cancer cell death through PTT and PDT

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Keywords: Aptamer, Magnetic graphene oxide, photothermal and photodynamic

S-B1-007

PREPARATION AND CHARACTERIZATION OF PROTEIN-INORGANIC HYBRID NANOFLOWERS AND AVAILABILITY OF DYE DECOLORIZATION

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The environmental pollution has been increasing day by day in our country. Industrialization, rapid population growth, and many factors such as pesticides can cause environmental pollution. As a result of industrial activities, dyes are the most obvious signal of water pollution [1]. When waste water containing dyes is mixed to a natural water, they adversely affect aerobic organisms by breaking photosynthesis-respiration balance and reducing the level of dissolved oxygen due to changing the several properties of water such as appearance of water, light transparency and gas solubility. Also, some dyes can act toxic, mutagenic and carcinogenic effects for living things [2, 3]. Thus, several methods have been developed and applied separately or together for wastewater treatmen [4]. The enzyme based systems have potential to decolor large volume of wastewater in an effective and economical way. However, free forms of enzymes have a short life time and this situation limites applications of enzymes in many areas. It is necessary to increase the efficiencies, activities, stabilities and recoveries of enzymes in order to use them in practice especially as biocatalysts. In recent years, the synthesis of flower-like protein-inorganic hybrid structures as newly developed immobilization method has drawn attention [5-9]. Some enzymes, especially laccase, are used in the biological wastewater treatment. In our study, laccase-Cu^{2+} hybrid nanoflower was synthesized and for the first time, it was used for dye decolorization. The schematic illustration of the synthesis and use of laccase-Cu^{2+} nanoflower for dye decolorization was shown in Figure 1. The hybrid nanoflowers were characterized with SEM, EDX, XRD and FTIR. Encapsulation yield % of hybrid structure was measured as 95-98%. The catalytic activity and stability of nanoflowers were dramatically enhanced compared to free enzyme. Dye decolorization capability of laccase-Cu^{2+} nanoflower was employed at different time and pH values to determine the optimal conditions for efficient dye decolorization.

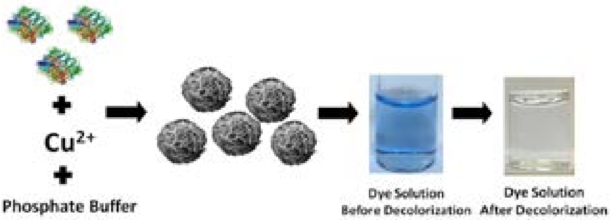

Figure 1: Schematic illustration of nanoflower synthesis and dye decolorization processes

Acknowledgements: *This study was supported by TÜBİTAK (Project Numbers: 115Z838).*

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Keywords: Hybrid nano structures, immobilization, enzyme activity, laccase, dye decolorization

S-B1-008

FABRICATION OF NON-ENZYMATIC GLUCOSE SENSOR BASED ON NANOCOMPOSITE OF NANOCELLULOSE-AuNPs

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Determination of glucose in body fluids is an important analytical challenge in diagnostic analysis, especially in the case of continuous monitoring of glucose level in diabetes mellitus patients.[1] Although enzymatic assays have been generally used for glucose determination, the most serious problem is its lack of enzyme stability, due to the intrinsic nature of the enzyme, the activity can be easily affected by various factors such as temperature, pH, etc.[2] To overcome these drawbacks, efforts have been made to fabricate enzyme-free glucose sensors based on electroactive materials with catalytic abilities that can oxidize glucose directly on the electrode.

In this study, a non-enzymatic electrochemical method was developed for sensing glucose by using a graphite rod electrode modified with nanocomposite of nanocellulose-gold nanoparticles. The modified electrode was characterized and its analytical performance was evaluated in pH 10 solution by cyclic voltammetry. The analytical performance was evaluated and linear calibration graphs were obtained in the concentration range of 1–12 mM glucose including the level of human blood glucose. The electrode was used to determine glucose in human serum samples and no interference is caused by galactose, fructose and saccharose.

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Keywords: electrochemical sensor, glucose, goldnanoparticle, graphite rod, nanocellulose

S-B1-009

CALCULATION OF THE SINGLE OSCILLATOR AND CLAUSIUS–MOSSOTTI MODEL PARAMETERS OF THE 2-HYDROXYBENZOTHIAZOLE (2-OHBT) WITH SOLUTION TECHNIQUE

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2-Hydroxybenzothiazole (2-OHBT) is a 2-substituted benzothiazole. In this study, 2-OHBT material and acetone solvent were used. The optical measurements have been performed by using Shimadzu model UV-1800 Spectrophotometer. The aim of this research is to calculate single oscillator and Clausius–Mossotti model parameters of 2-OHBT.

The refractive index (n) is a significant and fundamental parameter in optoelectronic applications. The n of the 2-OHBT material was obtained from the following equation [1],

$$n = \left\{ \left[\frac{4R}{(R-1)^2} - k^2 \right]^{1/2} - \frac{R+1}{R-1} \right\} \tag{1}$$

Fig. 1 shows the plot of n versus wavelength (λ) of the the 2-OHBT. As seen in Fig. 2, the refractive index (n) values of 2-OHBT decrease with increasing wavelength. This behavior is referred to a normal dispersion behavior. The n value varies from 3.31 to 2.03. The refractive index dispersion was evaluated using the single oscillator model due to normal dispersion behavior of the 2-OHBT.

The single oscillator model parameters such as dispersion energy, single oscillator energy, M_{-1} and M_{-3} moments, optical oscillator strengths, long wavelength refractive index, average oscillator wavelength, average oscillator strength, lattice dielectric constant, raito (N/m^*) of carrier concentration to electron effective mass of the 2-OHBT were calculated. Then, the Clausius–Mossotti local-field polarizability model parameters of 2-OHBT were determined.

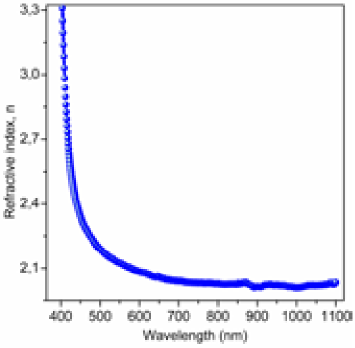

Figure 1: The plot of n versus wavelength (λ) of the the 2-OHBT material.

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Keywords: 2-Hydroxybenzothiazole, 2-OHBT, refractive index, single oscillator/clausius–mossotti model, solution technique.

S-B1-010

PRODUCTION AND CHARACTERIZATION OF MAGNETIC NANOPARTICLE LOADED POLY(Ɛ-CAPROLACTONE) NANOFIBERS BY ELECTROSPINNING METHOD

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The aim of this study is the synthesis and characterization of magnetic nanoparticle loaded poly(ε-caprolactone) (PCL) nanofibers by using electrospinning technique, for tissue engineering applications. The aim of tissue engineering field is to regenerate defected tissues by combining scaffolds and cells [1]. In recent years, the number of studies in tissue engineering field combining scaffolds with bioactive agents, drugs, hormones growth factors and functional nanoparticles increased. There is a potential tendency, about functionalization of scaffolds with nanoparticles. Since, PCL is a non-toxic, biodegradable, biocompatible polymer and electrospinning of this polymer is practical, it is widely used in nanofiber production. Our aim in this study is, to demonstrate the production method of new nanoparticle loaded nanofibers and the characteristic properties of this new composite material. In this research, Fe_3O_4 magnetic nanoparticles were loaded in PCL nanofiber membranes via electrospinning method and characterized. Fe_3O_4 nanoparticles were synthesized by a conventional co-precipitation method and treated by oleic acid in order to obtain hydrofobic nanoparticles. The nanoparticles were added to the polymer solution before electrospinning at varying concentrations (%4, 8, 16, 32, 64, 128 (w/v)). SEM and optic microscope images demonstrated that PCL nanofibers were in homogenous form. Fiber diameters changed and formation of beads started by increasing Fe_3O_4 concentration. FTIR results depict the characteristic peaks of PCL and Fe_3O_4. It was determined that an obvious color change in membranes and increase of magnetic properties were obtained by increasing amount of magnetic nanoparticles. As a result, a potential material with tunable properties was produced and characterized for a possible application in tissue engineering as a magnetically triggered drug release system.

Acknowledgements: This study was supported by the Scientific Research Projects Unit of Mersin University (BAP-2015-TP2-1345).

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Keywords: Electrospinning, Nanoparticles, Tissue Engineering

S-B1-011

CRYSTALLINE NANO-TiO_2 SYNTHESIZED AT RELATIVELY LOW TEMPERATURES IN DIVERSE MEDIA

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Photocatalysis can be defined as the formation of hydroxyl radicals and superoxide anions with the aid of visible (VIS) or ultraviolet (UV) illumination [1,3]. These radicals break down the organic harmful waste substances on the surface of the photocatalyst. Semiconducting oxides such as TiO_2, ZnO, SnO_2, etc. have been investigated as photocatalysts [1-4]. TiO_2 has been in the focus of attention since it provides better properties. TiO_2 particles can be synthesized through a number of methods including sol–gel [5], from inorganic salts as precursor [6], ultrasonic technique [7], reflux synthesis and hydrothermal method [8]. In most of these studies, the synthesized particles have been calcined to obtain crystalline TiO_2, which increases the particle size leading to a reduction in the total surface area and the photocatalytic efficiency

In this study, TiO_2 nanopowders were prepared via reflux synthesis by utilizing titanium ethoxide with various solvents such as ethanol, n-buthanol, n-hexanol and catalysts such as HCl, HNO_3, H_3PO_4, CH_3COOH and H_2SO_4. Different synthesis durations and temperatures were determined. According to XRD and TEM analyses in Fig. 1, TiO_2 nanopowders had anatase crystal structure without calcination, and their particle size was on the scale of 5 nm.

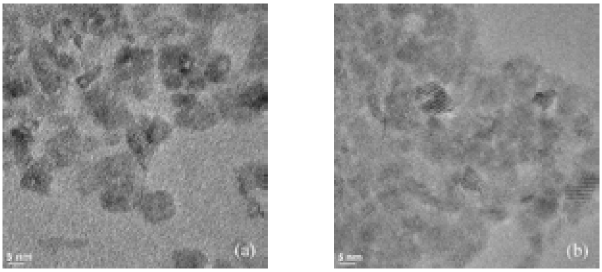

Figure 1: TEM micrographs of samples (a) HCl-5h, (b) HCl-10h

Obtained powders could be dispersed in both polar and non-polar solvents in Fig. 2a since they were prepared without calcination. Increasing the synthesis duration was seen to decrease the photocatalytic activity. The best reaction rate and half period of photocatalytic degradation of Rhodamine B were obtained when ethanol and HCl were used and when synthesis duration was 5 h.

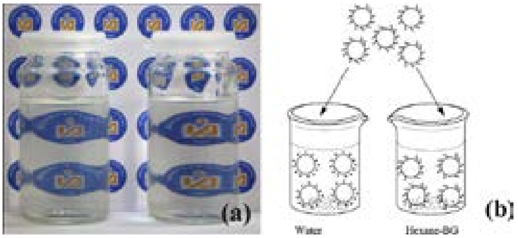

Figure 2: (a) Picture of 10% by weight of sample 4B in water (left) and hexane–BG (right).
(b) Illustration of preparation of TiO_2 hydrosols in water and hexane–BG.

Authors would like to thank to Akdeniz University Research Fund for financial support. Technical and financial support of NANOen is gratefully acknowledged.

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Keywords: TiO2, Hydrosol, Nanoparticle, Photocatalysis, Reflux synthesis

S-B1-012

SUBPHTHALOCYANINE SENSITIZERS FOR PHOTOVOLTAIC APPLICATIONS*

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Subphthalocyanines (SubPcs) are aromatic macrocycles formed by three isoindole units having a delocalized 14 π-electron system around a central boron atom. In the UV-Vis spectrum of SubPcs, two intense characteristics bands called Q and Soret bands are observed. The absorption range of SubPcs, 500-700 nm (Q band) and 300 nm (Soret-B band), can be shifted to longer wavelength for the desired application areas with bearing donor and acceptor groups located at the peripheral position. As well as being chemical and thermal stability, due to cone-shaped structure SubPcs don't show aggregation, unlike many aromatic molecules [1]. Consequently, SubPcs have been notable molecules for various applications in many research fields such as organic solar cells, photodynamic therapy, light-emitting diodes, and nonlinear optics in recent years [2].

In this study, a series of SubPc derivatives bearing tert-butyl phenol unit in the axial position and diverse substituent such as electron-donating or electron-withdrawing moieties at the peripheral position were synthesized and their performance as photosensitizers in organic solar cells such as dye-sensitized (DSSCs) [3] and bulk heterojunction solar cells (BHJ) investigated.

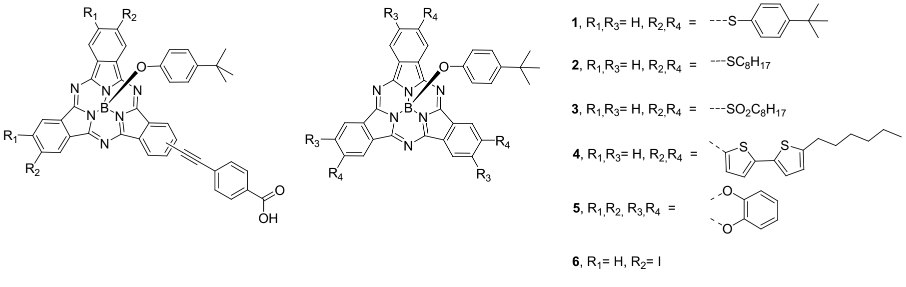

Figure1: Molecular structures of SubPcs for organic solar cells.

Acknowledgements :This work has been supported by The Scientific and Technological Research Council of Turkey, TUBITAK (Grant:114Z471).

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Keywords: Subphthalocyanines,DSSCs,BHJ.

S-B1-013

PREPARATION OF NOVEL PCL-CD POLYMERIC NANOPARTICLES

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Drug delivery system (DDS) can be defined as mechanisms to introduce therapeutically active agents into the body; efficiently, precisely and deliver the drug to achieve its desired therapeutic effects. Currently, research on DDS focuses on using polymers, metallic nanoparticles [1], polymeric nanoparticles [2], micelles and liposomes as drug delivery system.

Among the biodegradable colloidal nanocarriers, polyester based nanoparticles have received considerable attention as drug delivery systems by the intravenous route [3,4]. The aim of the present work was to develop a new type of biodegradable nanoparticles from an amphiphilic polymer based on poly-ε-caprolactone (PCL) grafted with β-cyclodextrin (β-CD-PCL-β-CD) at both chain ends as a potential drug delivery system.

The nanoparticles were prepared by an interfacial migration-solvent evaporation method derived from the technique of emulsion-solvent evaporation in which the polymer was first allowed to migrate to the o/w interface to form stabilizing layer around the solvent interface [5]. The nanoparticle size distribution, zeta potential, stability and suitability for freeze drying, were determined. The presence of β-CD on the surface was assessed by isothermal titration calorimetry (ITC) using an adamantly derivative.

Due to its amphiphilic properties, β-CD-PCL-β-CD polymer was able to migrate at the o/w interface and to stabilize the solvent droplets without the need of additional surfactants. Stable nanoparticles with a mean diameter of around 160 nm were obtained. The nanoparticles have been successfully freeze-dried in the presence of several cryoprotectants. ITC study has demonstrated that β-CDs were located on the nanoparticle surface, as they were accessible to adamantyl moieties. Moreover, the strength of the interaction between the CDs on the nanoparticles and the adamantyl groups was in the same order of magnitude as the one measured for native β-CD and adamantylamine in solution.

In conclusion, β-CD-PCL-b-CD nanoparticles were prepared successfully. Their inclusion complexation ability and encapsulation properties have been investigated with model guest by using ITC technique. They have showed excellent loading capacity with model guest molecule. All these result indicate that, they may serve as anti-cancer drug nano-carrier system, as they combine a hydrophobic biodegradable PCL matrix and CDs, both able to incorporate active molecules of interest.

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Keywords: Adamantane, cyclodextrins, nanoparticles, polymeric nanoparticles, host-guest

S-B1-014

SYNTHESIS AND ENCAPSULATION ABILITY PROPERTIES OF GOLD GLYCO-NANOPARTICLES

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Cyclodextrins (CD) are cyclic oligosaccharides, consisting of α-(1-4) linked D- glucose subunits, also known as Schardinger dextrins. They have a lipophilic central cavity and a hydrophilic outer surface (Figure 1). The $^4C_1$ conformation of the glucopyranose units forms a bottomless bowl-shape structure that exhibits all primary hydroxyl groups on a narrow face, and the secondary hydroxyl groups on the other edge. They comprise of 6, 7 or 8 glucopyranose units named α-, β- and γ-CD, respectively [1-3].

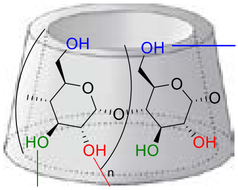

Figure-1: Representative model of Cyclodextrin (CD)

Gold nanoparticles (AuNPs) have unique physical properties that make them potential candidate for medical and pharmaceutical applications. Especially, AuNPs have great potential to overcome delivery limitations due to their attractive characteristics such as size, robust stability and biocompatibility [4,5]. Multi-functionality on the AuNPs is established by combining different features for diagnosis, targeting or/and delivery therapeutics agents into one scaffold. AuNPs bearing saccharides may be useful as carriers for transporting drugs to membrane containing specific sugar receptors. In addition, AuNPs provide a versatile scaffold for the construction of multivalent structures of bioactive molecules such as glycosides. This latter feature would allow the use of the so-called glycoside multivalent effect as a means to increase the protein-saccharide binding and therefore could improve the effectiveness of the drug delivery system [6].

In this communication, we have described the preparation of AuNPs containing multiple copies of lactose and β-cyclodextrin linked to the NP surface. Lactose is a carbohydrate that is specifically recognized by galectins, a family of lectins that are overexpressed on cancer cells. In addition, cyclodextrins are able to form host-guest complexes with a large variety of hydrophobic molecules in aqueous solution given the unique nature imparted by their structure [1,5,6]. In order to evaluate the potential of these cyclodextrin-coated glyconanoparticles as potential molecular carriers we studied their affinities for a biological targets and the inclusion complexation behavior with some representative guest molecules such as, adamantine. In addition, we have studied the encapsulation ability of these novel AuNPs with anti-cancer drug methotrexate. We have fully characterized the novel AuNPs through use of chemical and spectroscopic techniques, such as; UV-Vis, FTIR, NMR, etc. The average diameter of the functionalized AuNPs was determined by dynamic light scattering (DLS) and transmission electron microscopy (TEM).

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Keywords: Adamantane, Anti-Cancer, Cyclodextrins, Host-Guest, Gold Nanoparticles.

S-B1-015

INFLUENCE OF Al CONCENTRATION ON THE ELECTRICAL AND OPTICAL PROPERTIES OF ZnO THIN FILMS

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In this study Al:ZnO thin films having with Al at different concentrations were deposited on glass substrates by ultrasonic spray pyrolysis technique. The effects of Al doping on the structural, optical and electrical properties of Al:ZnO were investigated using with XRD, optical transmittance and sheet resistance measurements. The concentration of zinc acetate was 0.05 M and Al/Zn ratio in the solution varied from 0 to 20 at. %. Optical transmittance spectrum of the films in the form of film/glass was used to determine the film thickness and optical band gaps. The optical transmission of Al:ZnO/glass samples was higher than 80% in the visible and near infrared region. The optical band gaps of Al:ZnO films onto glass substrate are decreases with increase of Al content. In order to obtain the average sheet resistance of the films the current and voltage through the probes have been measured for five different position by four-point probe method. The results showed that the sheet resistance of Al:ZnO/glass samples increases with the Al concentration. Considering the film thickness and geometric factor, the electrical resistivity were computed. The electrical resistivity was obtained $3x10^{-1}$ Ωm for Al:ZnO/glass samples.

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Keywords: Al doped ZnO, thin film, ultrasonic spray pyrolysis, optical transmission, sheet resistance

S-B2-001

FUNCTIONAL HYDROGELS USING DENDRON-POLYMER CONJUGATES AS BUILDING BLOCKS

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As a versatile class of polymeric materials, hydrogels have become useful tools with a wide range of biomedical applications. The choice and design of hydrogel precursors is crucial for introducing the necessary attributes to hydrogels that dictate their properties towards the desired applications. Chemical modification of the hydrogel is needed to improve the functional properties of these constructs. Encapsulation and physi-absorption are the general methods used for incorporating small molecules, peptides, and enzymes into the hydrogel matrix [1]. Post-modification of the hydrogels is an alternative and attractive approach for incorporating small molecules and biomolecules to hydrogel matrix in recent years. The multivalent and multifunctional properties of dendritic structures provide advantages in the chemical and physical properties of the hydrogels [2]. In the studies to be presented, ABA type dendron polymer conjugates were synthesized using polyester dendrons with alkyne [3], alkene [4] and methacrylate and alkyne [5] groups and poly(ethylene glycol) with different molecular weights as hydrogel precursors. Thiol-ene and Huisgen click reactions were utilized for cross-linking to end up with functional hydrogels with high yields. Water uptake ratios, mechanical and morphological properties of hydrogels were compared. The residual alkyne and alkene groups at the junction points of the hydrogels allowed post-modification of the hydrogels. Post-modification of the hydrogels were performed with dye molecules having thiol or azide groups using thiol-ene or Huisgen click reactions. In addition, hydrogels were modified with biotin thiol or biotin azide compounds prior to biomolecule modification. Fine tuning of the degree of cross-linking and the amount of residual reactive groups for post-modification is controlled stoichiometrically. Degree of post-modification the hydrogels were measured by fluorescent microscope. Micromolding in capillaries and photo-patterning methods were used for hydrogel synthesis using same hydrogel precursors for different applications. Post-modification of the hydrogel patterns were also tested and compared.

Acknowledgements: This project has been funded by The Scientific and Technological Research Council of Turkey (TUBITAK, Project No: 108T898). Sadik Kaga is supported by the 2211-D grant program of The Scientific and Technological Research Council of Turkey (TUBITAK).

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Keywords: Hydrogel, Dendron, Polymer, Functional

S-B2-002

SYNTHESIS OF FUNCTIONAL WATER SOLUBLE POLYMERS AND PATTERNED HYDROGELS VIA THIOL-ENE CROSSLINKING

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The design and modification of polymeric materials such as soluble polymers, hydrogels and patterned hydrogel surfaces has become the focus of interest in recent years due to their potential application in areas such as cell and tissue engineering, drug delivery and platforms for biochip technology[1-2]. Polymeric materials can be designed both covalent and non-covalent crosslinking strategies [3-4]. Herein we focused on covalent crosslinking; since cross-linked structures obtained using covalent linkages are robust and can be used in harsh environments. Crosslinked polymeric materials can be obtained either by using a methodology that involves polymerization of monomers in the presence of a crosslinker, or through covalent crosslinking between polymers by addition of crosslinking agents. The later approach allows one to employ well-defined polymeric building blocks to obtain materials with superior homogeneity in their structure and chemical composition. In this study, we describe the synthesis of thiol reactive water soluble polymers and patterned hydrogels. Since, thiol-reactive micro-patterned surfaces enable successful immobilization of dyes, peptides as well as cells. We utilized easy and efficient thiol-ene chemistry to fabricate polymeric materials. Furan-protected maleimide-containing triblock copolymers along with thiol-based crosslinkers provide hydrogels via the radical thiol-ene reaction. Thermal activation of residual masked maleimides provides hydrogels that are functionalized with thiol-containing dyes and ligands that enable protein immobilization.

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Keywords: functional polymeric materials, thiol-ene, maleimide, patterning

S-B2-003

CAYIRHAN THE THERMAL POWER PLANT ASH POROUS BUILDING MATERIALS PRODUCTION

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In this study, Çayırhan the use of large quantities of released thermal power plant fly ash in the production of porous building materials it was investigated. For this purpose, about 90 % wt ash and other rest of the raw material mixture consisting of inorganic additives in the slurry was prepared by mixing with water a sufficient quantity of fluid consistency. The resulting porosity in the final step of mixing the slurry is fluid entraining agent was added and the slurry is shaped by pouring into metal molds.. Shaped samples were expected at room temperature for 5 hours . After waiting room temperature sludge bed volume of swelled and solidified cutting hardness of from about 100% . Afterwards, the solidified and removed from the cake mold with high porosity and under 12 bar pressure , it was cured in an autoclave for 6 hours . The samples obtained after autoclave curing Amasa chemical, physical, mechanical, mineralogical and taken to the micro-structure analysis and the obtained results are evaluated.

After assessing the results of analysis, using large amounts of bottom ash Çayırhan mechanical properties are good, low density is manufactured building materials having low thermal conductivity.

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Keywords: Ash, waste, porosity, mechanical properties, thermal conductivity

S-B3-001

PREPERATION OF LIGHT COLLECTOR ORGANIC MOLECULES - SINGLE WALL CARBONNANOTUBE HYBRID MATERIALS VIA “*CLICK*” CHEMISTRY AND INVESTIGATION OF SOLAR CELLS PROPERTIES

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Nowadays, renewable and production of clean energy are needed for prevention of global warming and environmental pollution. Recently researches on carbon nanotubes (CNT)-organic based solar cells have increased in number are preferred since its applications are very vast if applicable. These materials having high chemical stability and electrical conductivity take very much attention to science which could be able to be functionalized with different chemical groups and their derivates might lead to increase in efficiency on electrical, thermal, optical, photovoltaic and sensor properties. Today, various methods have been developed for the functionalized carbon nanotubes. This method of “Click” chemistry is one of them and has been used in recent years for the modification of similar material.

In this study, design and synthesis of new organic compounds for high-efficiency solar cells and preparation of CNT-hybrid compounds are investigated because efficiency of CNT based design in literature are low. Furthermore, these hybrid materials increased the amount of light intensity to be absorbed from the sun will be substituted with sub-phthalocyanine and coumarin for light collecting groups. “Click” chemistry technique used for chemically bond light collector for organic molecules on the surface of carbon nanotubes. The synthesized hybrid material containing triazole group increases the conductivity. In this study, the newly created light harvesting organic molecules and hybrid material structure is enlightened with NMR, mass spectroscopy, UV-Vis, CV, FTIR, SEM and Raman spectroscopy. Efficiency of the synthesized CNT organic solar cells will be determined with solar simulator.

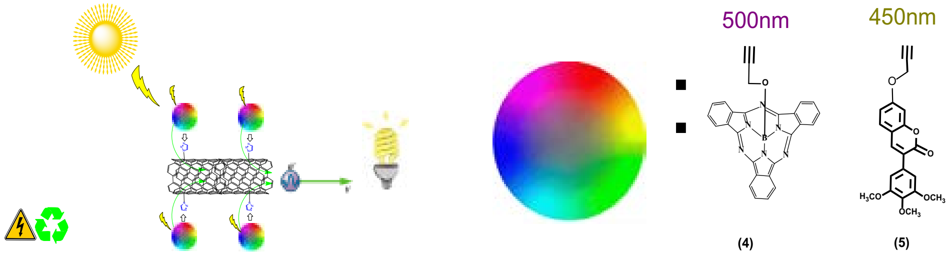

Figure.1: Light collector molecules and modification of carbon nanotube

Acknowledgements: This work was supported by the Scientific and Technological Research Council of Turkey (TUBITAK, Project number: 115Z734)

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Keywords: Renewable Energy, Solar Energy, Solar Cell, Carbon Nanotube, Coumarin, Sub-phthalociyanine

S-B3-002

SYNTHESIS, CHARACTERIZATION AND POTENTIAL APPLICATIONS OF α,β-UNSATURATED NITRILES

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Harvesting energy directly from sunlight using photovoltaic technnology is considered as being one of the most important ways to address growing global energy needs using a renewable resource. Among possible energy sources, solar cells are promising candidates.

Solar cells based on heterojunctions of inorganic semiconductors have been developed to achieve this goal, but their high production cost and the necessity to use of toxic chemicals during their production limit their mass utilization. In recent years, much attention has been focused on organic photovoltaics [1,2].

Organic solar cells mainly consist of active layer comprises p-conjugated polymers and small molecules [1,3]. In this study, we have been synthesized different α,β-unsaturated small molecules including nitrile groups. The synthesis of orjinal molecules were performed using benzaldehyde, p-chlorobenzaldehyde, pyridine-2-carbaldehyde, fluorene-2-carbaldehyde, furan-2-carbaldehyde, thiophene-2-carbaldehyde, benzene-1,4-dicarbaldehyde and p-chlorophenylacetonitrile, p-bromophenylacetonitrile, 2-chloropyridine-5-acetonitrile as starting materials by Knoevenagel condensation. All of them were characterized using with FTIR, ^{1}H-NMR, ^{13}C-NMR and LC-MS data.

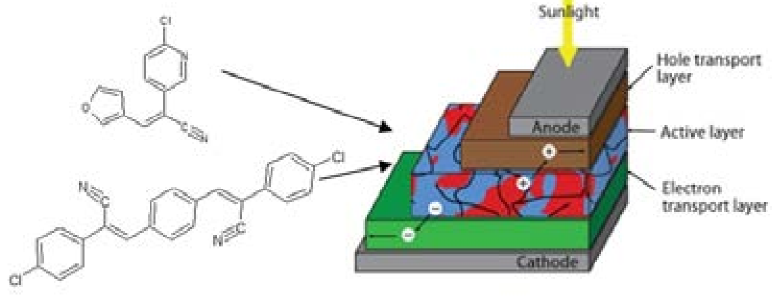

Figure 1: Structures of organic solar cell and small molecules as active layer

These molecules were evaluated as an electron acceptor in bulk heterojunction organic solar cells. All of them was highly soluble in common organic solvents, and their optical and electronic properties as well as photovoltaic performance were investigated. As a result, it was found to have a significant photovoltaic performance of these molecules.

Acknowledgements: We are thankful to Assist. Prof. Dr. Halil Gokce, (Giresun University) for providing Gaussian 09Wprogram and Yildiz Technical University, Faculty of Arts and Science, Department of Physics for photovoltaic studies.

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Keywords: solar cell, nitrile, energy

S-B3-003

4-(HYDROXYMETHYL)-1,3-DIOXOLANE-2-ON AND POLYETHYLENE GLYCOL CONTAINING BORATE ESTER POLYMER ELECTROLYTES

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The technology evolves the need for energy storage is increasing every day. Lithium-ion and lithium-polymer batteries are the prominent and widely used types of batteries for energy storage. The use of polymers instead of the organic solvents seems to provide more reliable batteries. In addition, the problem of capacity fading with time in lithium-ion battery is much less significant for lithium-polymer batteries.

Besides the other common uses, borate esters have attracted attention in recent years as polymer electrolyte. There are examples of borate esters used as additives in especially poly ethylene glycol based polymers but their use as polymer electrolyte is rather limited [1].

In this study, new polymer electrolytes containing the structure of most commonly used commercial organic battery solvent component (ethylene carbonate) as the side group has been synthesized. The synergetic effect of the polymers and the organic solvents are here aimed. New polymer electrolytes using PEG derivatives with varying M_n values were prepared. The best ionic conductivity values were obtained with PEG-600. Using this electrolyte composition, different salts with varying ratios were also investigated for further optimization. The optimum room temperature ionic conductivity value was measured for the polymer electrolyte with $(CF_3SO_2)_2NLi$ salt and the ethylene oxide:lithium ratio of 24 as 4.09 x10^{-5} S/cm. Polymer electrolytes showed also improved lithium transference number and wide electrochemical window reference to Li^+/Li.

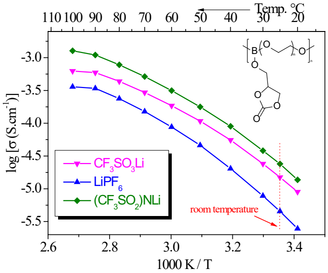

Figure 1: The Arrhenius graph of temperature dependent ionic conductivity of borate ester based polymer electrolytes.

Acknowledgements: This work was supported by Ahi Evran University (FBE.B2.16.001).

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[1] Wakihara, M.; Nakayama, M.; Kato, Y. “Lithium Ion Rechargeable Batteries”, (Wiley) **2010**, 213-255.

Keywords: borate ester, polymer electrolyte, lithium-ion battery

S-B3-004

THE USE OF TRIS(2-(2-METHOXY)ETHYL)BORATE AS SOLVENT AND ELECTROLYTE ADDITIVE IN LITHIUM-ION BATTERIES

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The improvement of energy storage devices, especially rechargeable lithium-ion batteries are gaining importance as the technology progress and the demand increases for high power density devices, such as electrical cars. For the improvement of the current lithium-ion battery technologies, new types of electrolyte compositions or additives are needed to be designed.

Besides the common industrial applications of the borate esters, some derivatives of them are available as polymer electrolyte [1]. In these studies, polymer derivatives are predominantly used as polymer electrolytes and there are only few examples where they were used as additives. In any case, the results show that they have positive effect on the conductivity of the electrolyte systems [2].

In this study, tris(2-(2-butoxyethoxy) methyl) borate was synthesized by the reaction of boric acid and glycerol carbonate using a Dean-Stark apparatus. The improvement of the electrolyte systems currently used in lithium-ion batteries and a borate ester electrolyte additive was aimed in this study. The synthesized borate ester and diethyl carbonate were mixed in varying ratios and 1 M $LiPF_6$ electrolytes were prepared. The prepared electrolytes were used to assemble a battery, where metallic lithium was used as anode and $LiFePO_4$ as cathode. The temperature dependent ionic conductivities of the prepared electrolytes were measured between -30 - +50 °C. The assembled batteries were continuously charged and discharged applying a controlled constant current using a battery tester in order to determine their performances as battery electrolyte. The synthesized borate ester was also used as an additive in a standard battery electrolyte (1 M $LiPF_6$ solution of ethylene carbonate:diethyl carbonate (1:1) mixture). Moreover, the other basic electrochemical properties, such as lithium transference numbers, cyclic voltamograms etc. were also studied.

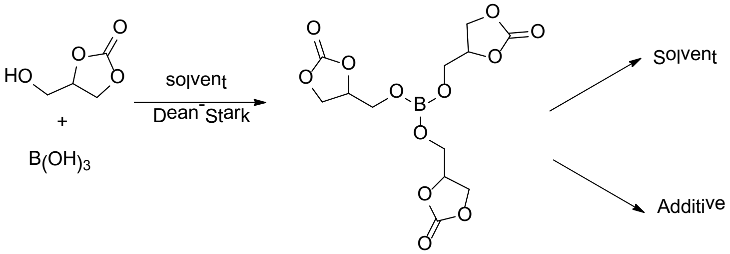

Figure 1: The chemical structures of (a) trimethyl-, (b) tris(trifluoroethyl)- and (c) tris(trimethoxyethyl)- phosphates.

Acknowledgements: This work was supported by TUBİTAK (Project Number: 114Z472).

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[1] Wakihara, M.; Nakayama, M.; Kato, Y. *Lithium Ion Rechargeable Batteries*, **2010**, Wiley, 213-255.
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Keywords: Borate Ester, Lithium-ion battery, electrolyte, solvent, additive

S-B3-005

THE USE OF SOME PHOSPHATE DERIVATIVES AS SOLVENT IN LITHIUM-ION BATTERIES

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In recent years, the progress in technology and the common use of the portable devices requires better battery systems. Therefore, the need for energy storage systems, particularly improved and safe lithium-ion batteries is increasing day by day. The target of this technology for use in applications that require high power applications such as electric cars requires the development of new, more powerful and high energy density lithium-ion batteries. In recent years, the use of phosphate derivatives as solvent or solvent component attracts great attention. The current research on this area focuses on the development of improved solvent or solvent mixtures to serve in lithium-ion batteries. As phosphates are in general non-flammable, better and safe electrolyte compositions can be formulated in this way [1].

In this study, the use of some phosphate derivatives is aimed to be used as electrolyte solvent. For this purpose, (a) trimethyl-, (b) tris(trifluoroethyl)- and (c) tris(methoxyethyl)- phosphates will be used as the solvent for the preparation of the electrolytes (Figure 1). For this purpose, 1 M $LiPF_6$ containing electrolytes will be prepared and using these electrolytes, the lithium-ion batteries with metallic lithium as anode and $LiFePO_4$ as the cathode will be assembled in a Glove-box. These batteries will be charged and discharged at least 50 cycles applying a controlled constant current using a battery tester.

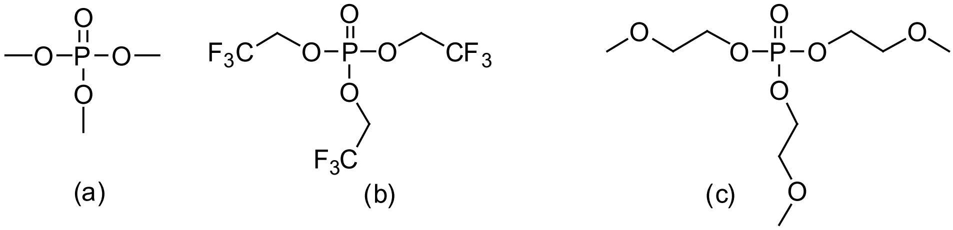

Figure 1: The chemical structures of (a) trimethyl-, (b) tris(trifluoroethyl)- and (c) tris(trimethoxyethyl)- phosphates.

Acknowledgements: This work was supported by Ahi Evran University (FEF.A3.16.017).

References:

[1] Scrosati, B.; Abraham, K. M.; van Schalkwijk, W. A.; Hassoun, J. *Lithium Batteries: Advanced Technologies and Applications*, **2013** Wiley.

Keywords: phosphate, lithium-ion battery, solvent, electrolyte

S-B3-006

THE USE OF ALLYL BIS(2-METHOXYETHYL) PHOSPHATE AS ADDITIVE IN LITHIUM-ION BATTERIES

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The progress in technology and the common use of the portable devices require improved secondary battery systems. Therefore, the energy storage systems need to be developed. Especially, the lithium-ion batteries with improved capacities are aimed for the common applications. High power applications such as electric cars require the development of new, more powerful and high energy density lithium-ion batteries. In recent years, the use of phosphate derivatives as both solvent and additives for the preparation of better and safe electrolyte systems attracts great attention [1].

In this study, the use of bis(2-methoxyethyl) phosphate (Figure 1) is aimed to be used as electrolyte additive. The electrolyte additives are used generally 1-5 % in order to produce a protecting film on the electrode surfaces so that act as a barrier to preserve the further oxidation or reduction of the electrolyte components. For this purposes, an additive which decomposes easily (usually polymerizes) are designed and used. For this purpose, the synthesized bis(2-methoxyethyl) phosphate will be added to a standard battery electrolyte (1 M $LiPF_6$ solution of ethylene carbonate:diethyl carbonate (1:1) mixture) in varying ratios. The prepared electrolytes will be used to assemble a battery, where metallic lithium is used as anode and $LiFePO_4$ as cathode. These batteries will be then charged and discharged at least 50 cycles applying a controlled constant current using a battery tester to determine their performances.

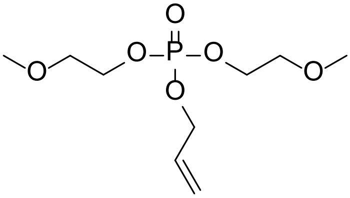

Figure 1: The chemical structures of bis(2-methoxyethyl) phosphate.

References:

[1] Scrosati, B.; Abraham, K. M.; van Schalkwijk, W. A.; Hassoun, J. *Lithium Batteries: Advanced Technologies and Applications*, **2013** Wiley.

Keywords: lithium-ion battery, phosphate, Solvent

S-B3-007

CO-PYROLYSIS OF GÖYNÜK OIL SHALE WITH POLYPROPYLENE AND STRUCTURAL CHARACTERIZATION OF PYROLYSIS LIQUID

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Energy and waste management are essential to economic and social development and improved quality of life in the world. The World reserves of conventional fossil fuels such as petroleum, natural gas and coal are finite. The supply of energy has become a worldwide problem in recent decades. This also encompasses the effective utilization of the fossil fuel reserves such as oil shale [1]. Oil shale is an organic rich sedimentary rock that contains significant amount of kerogen and mineral matrix [2]. On the other hand, the amount of waste plastics discarded each year is constantly increasing and is causing serious environmental problems. Therefore, polymer recycling has become a necessity. Due to the increased environmental awareness and depletion of natural oil deposits, the converting of waste plastics into liquid hydrocarbons is being considered a promising recycling method [3].

The co-pyrolysis technique has received much attention in recent years because these might allow the reduction of the volume of waste, the recovery of chemicals and the replacement of fossil fuels. The thermal co-processing treatment methods could be environment friendly ways for the transformation of oil shale and plastic waste into valuable products such as chemical raw material or fuels [4,5].

In this study, conversion of a fossil fuel having low calorific value with waste plastic into energy and chemical feedstock by co-pyrolysis was investigated. Göynük (Turkey) oil shale, which is the biggest and the most explored deposit in Turkey, was used as fossil fuel. Polypropylene (PP) selected as waste plastic which is one of the main polymers in municipal waste plastics.

Pyrolysis of Göynük oil-shale, polypropylene wastes and their mixtures were performed in a fixed bed reactor at different temperatures. The experiments were performed in the temperature range of 600 °C to 800°C with the mixtures consisted of oil shale/ polypropylene at the weight ratio of 2:1, 1:1 and 1:2. The effect of different ratios of polypropylene in mixtures on the thermal degradation of oil shale was investigated in terms of product distribution. The aim of study is to examine positive effect of polypropylene added to oil shale and range of temperature product yields. Experiments are repeated with adding of different catalyst (red mud, zeolite and bentonite) at the optimum conditions.

Liquid products (tar) ontained after operations were characterized using spectroscopic and chromatographic methods such as GC-MS and FTIR and the effect of experimental conditions on the formation of this valuable product has been determined. The highest tar yield was obtained at 800 ^{o}C with a 1:2 weight ratio of polypropylene to oil shale.

The addition of polypropylene to oil shale had positive effect on liquid product properties of oil shale. The results showed that co-pyrolysis of oil shale and polypropylene could be an environmentally friendly method for the conversion of plastic waste into valuable products such as chemicals or fuels and also this process can solve the plastic disposal problem.

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Keywords: Co-pyrolysis, oil shale, polypropylene

S-B3-008

METAL AND SEMICONDUCTOR NANOPARTICLES BY LASER ABLATION

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In this work, a new laser ablation approach is proposed to obtain highly uniform, ultrasmall and stable metal and semiconductor nanoparticles. In this approach, a spiral scanning is utilized to achieve highly uniform nanoparticles. The influence of different parameters such as power and scanning speed in morphological and optical properties of the nanoparticles is scrutinized. This methodology opens a new door in laser ablation field where less control on the particles size is a drawback for industrialization of this technology.

In recent years, semiconductor and metal nanoparticles has attracted a huge interest in variety of applications such as nanoelectronics and nanophotonics, energy and environmental sciences and bio nanotechnology and medicine. When a material is brought down to nm-scale sizes, its optical and electrical behavior can totally change. An example of these materials is semiconductors and their transition from indirect band gap (for bulk) to direct band gap (for nm size nanoparticles) when their size go below bulk *Bohr radius*[1]. This transition would facilitate absorbance and luminescence of the semiconductors which are key limiting factors for their usage in photovoltaic and light emitting diode (LED) applications. Another example of these nm size particles difference from bulk materials is metal nanoparticles. Approach small sizes in metal nanoparticles, a phenomenon called plasmonic absorption can be attained [2]. Therefore a bulk metal such as gold (Au) or silver which is totally reflective for UV-Vis spectrum of light will be absorbing for the same wavelengths. Up to now, several chemical and physical preparation methodologies have been utilized for the synthesis of these nanoparticles. Chemical methods, as the most commonly used ones, provide better controllability on particle size and surface properties but they have more complicated preparation route and several chemical bi-products and reducing agents are involved during these processes. On the other side, these chemical methods are restricted to specific class of materials and cannot be applied for any type of them. Recently, pulsed laser ablation, in liquid, gathered immense interest as a simple technique with a good production yield. Laser ablation offers several advantageous such as high purity and high stability. However, the drawback with this method is its less size control (size uniformity), and difficulty in reducing particles size below *Bohr radius*. To tackle with this problem, colloidal nanoparticles production has been investigated employing different laser types with different wavelengths and pulse durations. In most of these studies, nanosecond laser pulses have been utilized which results on formation of highly size distributed nanoparticles which stabilize in the form of clusters [3]. Therefore, some post-treatments are necessary to avoid agglomeration and enlarging of nanoparticles. This issue is less destructive for femtosecond laser in which a better size control mechanism can be obtained by tuning the laser pulse energy.

In this work, we used spiral type of line scanning to obtain highly uniform sub 10 nm nanoparticles. In this type of scanning, the ablated nanoparticles are collected toward the center and in following cycles these nanoparticles would be ablated again. Therefore, the nanoparticles will be trapped inside the active lasing area and will be ablated in every cycle. Consequently, highly uniform ultrasmall nanoparticles would be produced. Fig. 1 shows an image containing different types of semiconductor and metal nanoparticles with different sizes. In this study, the structural, optical and electrical behavior of these nanoparticles has been scrutinized in detail.

Figure 1: Different metal and semiconductor nanoparticles obtained using the proposed laser ablation methodology

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Keywords: Laser Ablation, Nanoparticles, Semiconductors

S-B3-009

DESIGN OF A NOVEL CONDUCTING COMPOSITE SUPPORTED BY PT NANOPARTICLES FOR HYDROGEN PRODUCTION FROM WATER

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Increasing energy requirements due to industrial and population growth has made the fossil fuels, insufficient. Hydrogen seems to be an ideal energy carier as a carbon-free fuel due to its high energy density. The generation of molecular hydrogen by the electrolysis of water is an important part of clean energy technologies [1-2]. A practical and sustainable way to produce hydrogen is by the electrolysis of water, but this has one disadvantage due to an overpotential occurring in the electrochemical system, which increases the cost of the method. Although some noble metals, such as Pt, Au and Rh, are known as good hydrogen evolving catalysts in acidic solutions, the high cost of these metals limits their large-scale application. Therefore, cost-effective materials for the electrochemical production of hydrogen are a central area of the research into renewable energy. In addition to being low-cost, it is a challenge to develop highly active catalysts that are stable for long periods. From this point of the view, due to it being electrochemically active, low-cost and commercially available aluminium electrode is an appropriate material for hydrogen production as in many other electrocatalytic applications [3-4].

Conducting polymers and conducting polymer based layers incorporating metal nanoparticles modified on various electrode materials have been widely used for electrocatalytic processes [5]. The porous structure, and consequently high surface area, of conducting polymers has led to their use as supporting materials for the development of new electrocatalytic materials.

On the other hand, Chitosan is a natural biopolymer that has attracted great attention in recent decades, both in science and various areas of everyday life due to its interesting properties, such as excellent film forming ability, high mechanical strength, cheapness and susceptibility to chemical modifications [6].

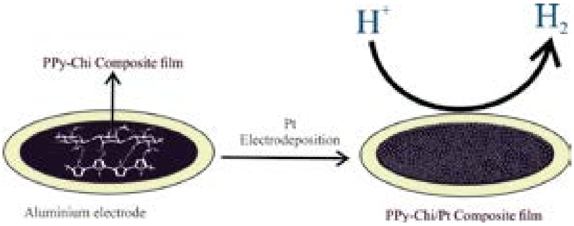

Figure 1: Schematic illustration of experimental setup.

Herein we present a method for the fabrication of an efficient catalyst for electrocatalytic hydrogen production from water by modifying a low-cost and low-technology aluminium electrode. The modification was performed by codeposition of polypyrrole using the abundant natural biopolymer chitosan as the raw material. Then we used this porous surface for the electrodepositon of platinum metal particles at the nano-scale, which exhibit high catalytic activity in hydrogen evolution. Using this efficient catalyst at the nano-scale considerably reduced the amount of Pt in the catalyst, resulting in low cost of prepared catalyst. The performances of both PPy-Chi and PPy-Chi/Pt were examined by electrochemical techniques.

Acknowledgements: This research has been supported by The Scientific and Technological Research Council of Turkey (TUBITAK-114Z315).

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Keywords: Hydrogen Energy, conducting composite, Pt nanoparticles

S-B3-010

MPt (M: Co, Ni, Cu) ALLOY NANOPARTICLES ASSEMBLED ON REDUCED GRAPHENE OXIDE AS CATHODE CATALYSTS FOR NONAQUEOUS LITHIUM- OXYGEN BATTERIES

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The hybrid electric and plug-in hybrid electric vehicles are attracting wider attention while energy challenges and environmental problems increasing gradually [1]. In this respect, the rechargable battery technologies are the most promosing solutions for energy storage problem. Lithium-ion batteries have been used in portable electronic devices for almost two decades, but their energy density (150–250 Wh **kg**$^{-1}$) is limited to be used in electric vehicles and stationary energy storage applications. Therefore, the rechargeable lithium-oxygen (Li-O$_2$) batteries have recently attracted world-wide attention as the next generation energy storage system owing to their extremely high theoretical specific energy density (~3560 Wh kg^{-1}) [2] that is much higher than that of any existing rechargeable batteries. In a typical nonaqeous Li-O$_2$ battery, which is constituted by a Li anode, a porous air-cathode and a Li-ion conducting organic electrolyte, the oxygen reduction reaction (ORR) (2Li + O$_2$ ′ Li$_2$O$_2$) and the oxygen evolution reaction(OER) (Li$_2$O$_2$ ′ 2Li$^+$ + 2e$^-$ +O$_2$) occur during the discharge and charge processes, respectively [3-5]. Several technical obstacles must be handled in order to design a rechargeable LAB with the desired energy density and cycle stability [6]. The hurdles associated with the air cathode are the most important ones among those challenges because air cathode has a major role on the performance of LABs.

In this work, monodisperse MPt alloy NPs were prepared by using one-pot protocol comprising the thermal decomposition and following coreduction of metal acetelyacetonates in the presence of oleylamine (OAm) as surfactant, reducing agent and solvent. As-synthesized MPt alloy NPs were then assembled on reduced graphene oxide (rGO) via liquid self-assembly method. Both colloidal MPt alloy NPs and rGO assembled ones were characterized by TEM, XRD and ICP-MS. From the TEM studies, it was concluded that all MPt alloy NPs have almost monodisperse particle distribution with the mean particle size of 9.0 ± 0.8 for $Co_{48}Pt_{52}$, 8.1 ± 1 for $Ni_{47}Pt_{53}$ and 6.2±0.9 nm for $Cu_{49}Pt_{51}$ NPs. The cathode performance of rGO-MPt catalysts were evaluated by studying the galvanostatic discharge-charge tests that were carried out in a Li-O$_2$ cells using a solution of 0.5 M LiTFSI in DMSO as an electrolyte at an applied current density of 0.05 mA cm^{-2}. The Li-O$_2$ cells with rGO-MPt cathode catalysts provided the discharge capacities reaching up to about 9.0 mAh cm^{-2}. Among three rGO-MPt catalysts tested for the Li-O$_2$ battery, rGO-$Co_{48}Pt_{52}$ provided the highest discharge capacity of 9898 mAh g^{-1} and 80 cycles at the curtailed capacity of 0.75 mAh cm^{-2} whereas the rGO-$Ni_{47}Pt_{53}$ catalyst showed the most stable cycle-life.

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Keywords: alloy nanoparticles, electrocatalyst; lithium oxygen battery, platinum, reduced graphene oxide

S-B3-011

PRODUCTION AND CHARACTERIZATIONS OF Nd_2O_3 DOPING *fcc*-ZrO_2 ELECTROLYTE TYPE SOLID OXIDE FUEL CELLS

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In this study, the fabrication of different types of the 0.4-LNF cathode supported solid oxide fuel cells which contain Nd_2O_3 doped ZrO_2 (*fcc*) based solid electrolyte materials were investigated. *fcc*-ZrO_2 phase was stabilized with the doping of Nd_2O_3 by using the sol-gel techniques. The impedance electrical conductivity measurements indicated that the produced single *fcc* phases had an oxygen ionic type electrical conductivity. 19-NdSZ has the highest electrical conductivity in the produced thin film solid electrolytes. Its electrical conductivity was observed as 0.018 $ohm^{-1}cm^{-1}$ at 850 °C, under 150 mL/min oxygen gas flow metric rate. Conductivity measurements results indicated that 19, 21-NdSZ thin films can be used for the production of SOFCs. Thin films of the solid electrolytes and stack of the fuel cells were produced by the spin coating method. XRD, DTA/TG, SEM and impedance electrical conductivity characterizations were made for the produced materials. The power density measurements of five-component and two types fuel cells which are signified as "LNF cathode|cathode active (LNF+*fcc*-NdSZ)|solid electrolyte (19 or 21-NdSZ)|NiO-NdSZ composite anode active|NiO anode" were measured by the test station system . All of the experimental results showed that the highest performance appeared five-component SOFC system of cathode (LNF)|cathode active (19-NdSZ+LNF)|solid electrolyte (19-NdSZ)|anode active (volume ratio:%60 NiO+%40 NdSZ+0.3 g active carbon)|anode (NiO+0.3 g active carbon) and the maximum electrochemical cell performance was observed 148 mW/cm^2 at 850 °C. The performance of other produced solid oxide fuel cell of (LNF cathode|cathode active (LNF+21-NdSZ)|solid electrolyte (21-NdSZ)|NiO-NdSZ composite anode active|NiO anode layers) was measured as 127 mW/cm^2 at 850 °C operation temperature.

Acknowledgements: This work was financially supported by Erciyes University Scientific Research Unit (ERUBAP, Grant No: FYL-2016-6314).

Keywords: Fuel Cell Performance and Power Density, Oxygen Ionic Electrical Conductivity, Sol-Gel Techniques, Solid Oxide Fuel Cell (SOFC), ZrO2 Based Solid Electrolyte

S-B3-012

TUNING WORK FUNCTIONS OF TRANSPARENT CONDUCTING ELECTRODES BY 2 eV USING CONJUGATED PHOSPHONIC ACIDS

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Self assembled monolayers of small molecules have been utilized in tuning the physical and electronic properties of the metal oxides and conductive contacts for organic electronic applications. In this work, we discuss aromatic phosphonic acid modifiers with conjugated linkages for tuning work functions of transparent conducting oxides, for example, zinc oxide (ZnO) and indium tin oxide (ITO). Conjugated phosphonic acid molecules show a substantially larger range of dipole moments than their unconjugated analogues, leading to the tuning of ZnO and ITO electrodes over a 2 eV range as derived from Kelvin probe measurements. Then, we have found that these work function changes are directly correlated to the magnitude and the direction of the computationally derived molecular dipole of the conjugated phosphonic acids, driving the synthesis of new and improved phosphonic acid ligands as seen in Figure 1. As an example, zinc oxide treated with 2,6-difluorophenylvinylphosphonic acid, showed a 0.78 eV decrease in the effective work function versus un-modified ZnO, while non-conjugated 2,6-difluorophenylethylphosphonic acid resulted in a 0.57 eV decrease. This resulted in an average power conversion efficiency of 5.89% for conjugated 2,6-difluorophenyvinylphosphonic acid modified P3HT:ICBA inverted devices solar cells, an improvement over un-modified (5.24%) and non-conjugated phosphonic acid modified devices (5.64%), indicating the importance of the conjugated linkages.

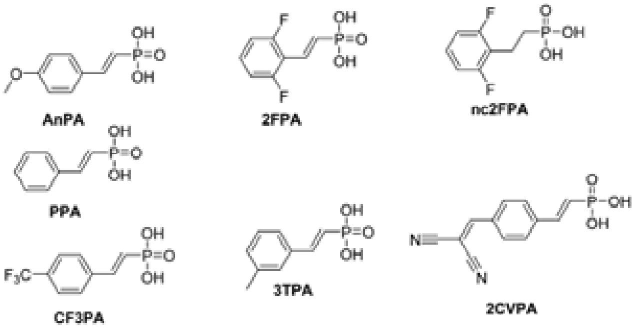

Figure 1: Chemical structures of the novel phosphonic acids.

Keywords: conjugated phosphonic acid, self assembled monolayer, conducting transparent electrode

S-B3-013

MALGAMA METHOD USING SODIUM BOROHYDRIDE (NABH4) PRODUCTION

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Küresel ısınmanın etkilerinin artması ve dünya enerji kaynaklarının giderek azalması ile birlikte yenilenebilir enerji kaynakları gün geçtikçe önem kazanmaktadır. Hidrojen, yenilenebilir enerji kaynaklarından biridir. Hidrojenin önem kazanmasıyla beraber hidrojen üretimi ve depolanması üzerindeki çalışmalarda hızla artmıştır.

Hidrojenin teknolojik kullanımının olabilmesi için depolanması gerekir. Bunun için genellikle bor bileşikleri kullanılmaktadır. Günümüzde en çok tercih edilen bor bileşiği sodyum borhidrürdür.

Bu çalışmada, malgama yöntemi kullanılarak sodyum borhidrür (NaBH4) eldesi gerçekleştirilmiştir. Sodyum metaborat, sodyum klorür ve cıva kullanılarak elektroliz sistemi kurulmuştur. Elektroliz sonunda, cıva ayırma hunisi ile ayrılmış ve geriye sodyum metaborat, sodyum borhidrür ve sodyum hidroksitten oluşan üçlü bir karışım elde edilmiştir. Daha bu karışımdan sodyum borhidrürün ayrılması için kullanılacak çözücüler üzerinde çalışılmıştır. Yapılan denemeler sonunda, çözücü olarak dimetil formamid uygun bulunmuştur.

Keywords: Malgama, sodium borohydride, electrolysis

S-B3-014

THERMOCHEMICAL CONVERSION BEHAVOUR OF DIFFERENT BIOMASS FEEDSTOCKS: GASIFICATION AND PYROLYSIS

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In this study, a bench-scale bubbling fluidized bed reactor and thermogravimetric methods were applied for the determination of the thermochemical conversion reactivity of biomass fuels under both gasification and pyrolysis conditions. Six different biomass feedstock samples, namely, straw pellet, softwood pellet, torrefied wood chips, pyrolysis char, DDGS and sunflower oil cake, were investigated. During the air gasification of these feedstocks (except DDGS), the product syngas was characterized in terms of main gas composition, tar and sulfur compounds. Main syngas composition (CO, H_2, CO_2, CH_4, O_2 and N_2) was measured in-line via a specifically configured analyzer set consisting of infrareds, paramagnetic sensor and thermal conductivity detector. Cold gas efficiency, heating value and carbon conversion were calculated based on the experimental conditions and measured gas composition. Conventional gravimetric (CEN/TS 15439) method was used for sampling of tar compounds. Tar compounds analyzed using a gas chromatography (GC) equipped with flame ionization detector (FID). The amounts of total sulfur and individual sulfur compounds were determined by UV fluorescence and GC PFPD (pulsed flame photometric detector) techniques, respectively. Thermogravimetric analysis of biomass feedstocks was carried out under pyrolysis conditions with the help of a TGA apparatus. Since thermal decomposition of biomass is influenced by many factors such as heating rate, temperature, pressure, residence time, moisture, composition and particle size, fine powder samples below 250 μm were used and thermographs were taken at four different heating rates. Raw data obtained from the experiments were used to calculate kinetic parameters (A, E_a) of samples by using two different models; Coats-Redfern and Isoconversional Method. When the gasification behaviors of these feedstocks were evaluated, it was shown that the highest cold gas efficiency, carbon conversion and calorific value were obtained for the gasification of straw pellet. On the other hand, straw pellet had some drawbacks regarding its high agglomeration tendency and low deformation temperature. It was observed that sunflower oil cake produced the highest tar yield (~ 32.8 gC/Nm^3), compared with wood pellet (~ 9.4 gC/Nm^3), straw pellet (~ 4.3 gC/Nm^3), torrefied wood chips (~ 1 gC/Nm^3) and pyrolysis char (~ 2 gC/Nm^3). Wood pellet and torrefied wood chips had lower amount of sulphurous compounds and these amounts were proportional to the sulfur contents of feedstocks. In all cases H_2S was the dominant sulphurous compounds in the syngas. When the pyrolysis behavior of these feedstocks were examined, it was seen that pyrolysis char was the only sample showing higher temperature decomposition above 800 K. Char yields upon pyrolysis were calculated to be nearly constant for all samples, except pyrolysis char. This was interpreted as the existence of a balance between bond breaking and cross-linking reactions under the experimental conditions [1]. Among all the examined samples, DTG profiles of DDGS and pyrolysis char differentiated from the others. Two peaks and two shoulders at around 450-650 K were observed for DDGS while no peaks were detected for pyrolysis char as the indication of absence of volatiles/cellulosic components. It was seen that the highest devolatization rates and devolatization maximum temperatures (associated mainly with cellulose decomposition) were obtained for softwood and torrefied wood samples, which had the least char yields among the other biomass feedstocks. The lowest char yields obtained with woody samples were attributed to their low ash contents below 1%. It was seen that the choice on the starting and ending points of decomposition stages was determinative in Coats & Redfern method, whereas Isoconversional method was evaluated to be independent from the choice of the stages and gave more freedom to the user [2, 3]. Thus, comparisons were made based on the isoconversional method. Calculated activation energies and characterization studies indicated that, softwood pellet was more reactive to thermochemical conversion and less proned to agglomeration. Although sunflower oil cake gave comparable activation energies with the softwood pellet, its high ash content and agglomeration index were the potential drawbacks in front of its utilization via thermochemical conversions.

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Keywords: gasification, pyrolysis, biomass

S-B3-015

SURFACE MODIFICATION OF CdSeS NANOCRYSTALS FOR HYBRID SOLAR CELL APPLICATIONS

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Cost is an important issue in the production of flexible solar cells. Thus, organic photovoltaics (OPVs) may have an important contribution in the growing portfolio of 3rd generation solar cell technologies [1]. The first hybrid bulk heterojunction (BHJ) solar cell was reported by Alivisatos and coworkers in 2002 by blending a donor polymer (P3HT) with a quantum dot material (CdSe) inwhich it acted as an inorganic acceptor phase instead of the fullerenes [2]. Recent investigations indicated that there are some advantages of hybrid nanocrystal/polymer solar cell: They are mainly: *i)* showing high electron mobility and stability with respect to pure inorganic semiconductors; *ii)* producing enlarged absorption range which leads to a very efficient utility of sunlight [3].

In this study, a series of CdSeS quantum nanocrystals were synthesized, their surfaces were modified by organic dendrimers (i.e. carbazole-fluorene) and then these materials were finally used to fabricate polymer/hybrid solar cells. Electrochemical and optical properties of the modified CdSeS nanocrystals were investigated by cyclic voltammetry, UV-Vis absorption and fluorescence spectroscopy.

The photovoltaic performances of the fabricated solar cells were examined under standard conditions (i.e. AM 1.5 illumination with a power of 100 mW/cm^2) using bulk heterojunction devices. They showed different photovoltaic performances and obviously produced different power conversion efficiencies, η, depending on the type of carbazole-fluorene dendrimers used as surface modifiers for CdSeS quantum nanocrystals centers.

Acknowledgements: We gratefully acknowledge the support from Scientific and Technical Research Council of Turkey (TUBITAK, Project number: 113Z254).

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Keywords: Surface modification, hybrid solar cells, dendrimer

S-B3-016

ENHANCED CAPACITY RETENTION OF Li_2CO_3 COATED $LiMn_2O_4$ CATHODE MATERIAL FOR LITHIUM BATTERIES

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The lithium manganese spinel $LiMn_2O_4$ has been considered for over a decade the ideal replacement for $LiCoO_2$ currently used in mass produced Li-ion battery cathodes. The driving forces for this are (i) lower cost, about ten times lower than $LiCoO_2$, (ii) safer operation due to its steep end of charge signal, (iii) abuse tolerance due to its higher decomposition and oxygen release temperature than $LiCoO_2$and green attributes (easy disposal) due to its low toxicity [1-2]. Recent studies showed that the dissolution of manganese and electrolyte decomposition are suppressed by surface modification of cathode electrode. Because the side reactions caused Mn^{2+} dissolution occur mainly at the surface of cathode powder during the cycling test, surface modification in both cathode and anode electrode could improve the electrochemical property of Li-ion batteries [3]. This study examines the effect on the electrochemical cycling performance of $LiMn_2O_4$by coating its surface with the Li_2CO_3 via solution method $LiMn_2O_4$ was prepared by a glycine-nitrate combustion process and then coated with Li_2CO_3. The cation composition of the the bare and surface-treated $LiMn_2O_4$ powders was determined by a flame atomic absorption spectrometer (AAS, Perkin Elmer 3110) and flame photometer (FP, Jenway PFP7). The phase identification and evaluation of the lattice parameters of the bare and surface- treated $LiMn_2O_4$ powders were carried out by powder X-ray diffraction (XRD) using CuKά radiation (Bruker AXS D8). The particle morphology of the powders was examined by means of scanning electron microscopy (SEM,LEO 440). The electrochemical studies were carried out in swagelock cells. The cells were fabricated by using the bare and surface- treated $LiMn_2O_4$ as a cathode and lithium foil as an anode. The preparation, structure and electrochemical performance of the surface-treated $LiMn_2O_4$ cathode material are discussed incomparison with the bare one. Figure 1 shows that the capacity retention of the Li_2CO_3-coated $LiMn_2O_4$ over 30 cycles at RT was about 99%, while pristine showed 80.4% capacity retention of the initial discharge capacity. Therefore, to improve the electrochemical performance of $LiMn_2O_4$ cathode material, the coating is an effective way.

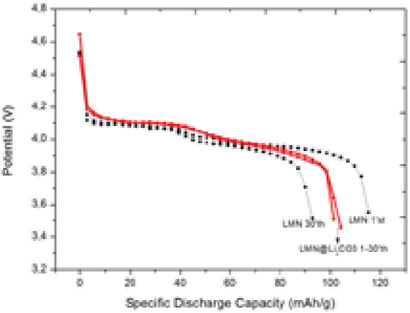

Figure 1: 1'st and 30'th discharge curves of LMN and LMN@Li_2CO_3

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Keywords: Lithium Batteries, Capacity Fade, LiMn2O4, Charge-Discharge

S-B3-017

HYDROTHERMAL SYNTHESIS OF LiFePO$_4$ COMPOSITE CATHODE MATERIAL FOR Li-ION BATTERY

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In the past two decades, LiFePO$_4$ has undoubtly become a competitive candidate for the cathode material of the next-generation LIBs due to its abundant resources, low toxicity and excellent thermal stability, etc.[1] However, LiFePO$_4$ shows poor electronic conductivity (′ 10^{-14} cm^2 S^{-1}) and low lithium ion diffusivity, which are an obstacle when applied in high power batteries . In order to overcome these problems, all kinds of methods have been proposed including carbon-coating on LiFePO$_4$ surface, cation doping and particle size minimization.[2-3] Carbon coating substantially promotes electrochemical properties of LiFePO$_4$ material by controlling crystallite size and forming thin, tightly attached, and uniform carbon layers. The conductive carbon layer well coated on particle surfaces can improve the electronic conductivity of LiFePO$_4$, and the particle size minimization is an effective way to decrease the diffusion distance for charge transfer, which can overcome the low Li-ion diffusion rate.[4]

In this study, bare LiFePO$_4$ and carbon coated LiFePO$_4$/C were prepared by hydrothermal synthesis method. The tartaric acid using as a carbon source. Structure and electrochemical performances of LiFePO$_4$/C were characterized by X-ray diffraction (XRD), scanning electron microscopy(SEM), electrical conductivity and galvanostatic charge/discharge measurements. The electrochemical properties of both bare LiFePO$_4$ and carbon coated LiFePO$_4$/ were evaluated using a CR2032 type two electrode coin-type cell in the half-cell configuration.

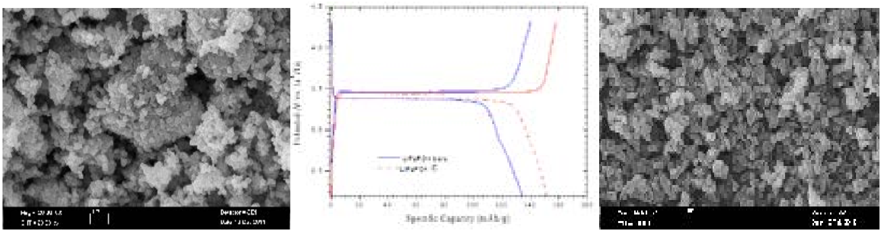

Fig 1. The SEM picture and firsth charge –discharge profile of bare and carbon coated LiFePO$_4$

The carbon coated LiFePO$_4$/C sample has better performance than bare LiFePO$_4$. Composite cathode exhibits a discharge capacity of 154 mAhg^{-1} corresponding to 90% of the theoritical capacity. However, the discharge capacities of bare LiFePO$_4$ was 135 mAhg^{-1}at the 0.1C-rate. The improving electrochemical performance related an efficient carbon coating and low contact resistance between the active material particles.

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Keywords: Li-ion battery, LiFePO4, carbon coated

S-B4-001

POLYGLYCOLIC ACID AND COPOLYMERS FROM CATIONIC POLYMERIZATION OF C1 FEEDSTOCKS

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Polyglycolic acid (trade name Kuredux by Kureha corporation) is the simplest biodegradable poly(' -hydroxy acid). It has repeat units of glycolic acid found in some sugar crops. Industrially, the most common strategy to synthesize PGA relies on the ring-opening polymerization of glycolide with mostly using tin octanoate catalyst. Although this route has been the best option in terms of high yields and molecular weights, the need to use expensive glycolide monomer and toxic tin catalyst limit the industrial scale production of PGA. We present a new approach to synthesizing PGA via the cationic alternating copolymerization of formaldehyde (from trioxane) and carbon monoxide (CO), sustainable C1 feedstocks obtainable from biomethanol or biogas. This method constitutes an inexpensive and efficient pathway for the synthesis of PGA. PGA was successfully synthesized with yields up to 92%. To improve on the physical properties of PGA, the method is used to make copolymers of PGA where some epoxide comonomers are included into the polymerization mixture to yield polyester-ether thermoplastics. The addition of minor quantities of epoxide comonomers vastly improves the appearance of the PGA and allows for rational and programmed control of the polymeric properties, such as melting temperature and solubility. One of the PGA-based copolymers exhibited thermal properties similar to those of polypropylene, and we are suggesting that PGA copolymers may be replaced to this polyolefin in some applications [2].

Figure 1: Stepwise production of PGA via two different routes.

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Keywords: polyglycolic acid, formaldehyde, carbon monoxide, cationic polymerization

S-B4-002

OUTLINES SUCH INVESTINGATION FOR VARIOUS IONITES AND SUMMARIZES VARIOUS THERMODYNAMIC PARAMETERS

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We have tried to ascertain acid-base properties of the follows ionites: KU-2x8 with the sulfonate-acid functional group, KB-4Px2 with the carboxyl functional group, chelating Diaion CR-11 and Amberlite IRC-748 with the iminodiacetic group, Dowex M-4195 with the bis-picolilamine group; also we have clarified equilibrium amounts, kinetic parameters of interaction between Zn^{2+} and Pb^{2+} ions of specified ionites from the point of view of thermodynamic quantities characterizing these processes.

There is enough information on acid-base properties of KU2x8 and KB-4Px2 in the literature, thats why we haven't touched known parameters of these ionites, but studied acid-base indicators of Diaion CR-11, Amberlite IRC-748 [1] and Dowex M-4195 by potentiometry method, dissociation constants of the ionite functional groups have been calculated by the equation of Henderson-Haselbach. The follows values have been obtained for DiaionCR $pK_1 = 4.7 \pm 0.1$ to 11; $pK_2 = 8.8 \pm 0.2$, for Amberlite IRC-748 $pK_1 = 5.5 \pm 0.1$; $pK_2 = 9.2 \pm 0.1$, for Dowex M-4195 $pK = 7.6 \pm 0.3$. The known methods (Langmuir, Freundlich, Langmuir-Freundlich, Redlich-Peterson, Toth and Dubinin-Radushkevich) were used for the mathematical treatment of sorption isotherms; it has been revealed that in all cases Langmuir equation expresses isotherms more normal and with minor span of error. All this confirms that the ionite surface in the studied systems is covered with a homogeneous monolayer and all active centers are characterized equal sorption energy and enthalpy. In all cases the cation absorption is expressed by a linear dependence with high correlation coefficient in C_t/A-C_t coordinates within the limits of experimental error. The values of maximal absorption A_{max} and exchange constant K have been calculated for each case using this dependence. It is ascertained that in the main initial parts of isotherms follow also the Freundlich equation; constants of this equation are calculated; design formulas indicating all studied systems have been offered according to Langmuir and Freundlich equations [2].

It has been determined that the rate of processes in all cases is controlled by the internal diffusion in the selected concentration range (1.0 gMe/l)[3]. The kinetic mechanism of these has been specified according to the Bio criterion. Values obtained for the Bio criterion were in all cases more than 50, also the dependence F-$T^{1/2}$ was expressed by straight lines beginning in the origin of coordinates in all cases up to the values of $F = 0.4$-0.5. Enthalpy of the studied processes is determined as the ratio of quantity of heat given off and amount of absorbed ions. Sorption processes are exothermic, but observations show that exothermicity decreases parallel to the saturation of ionites with metal ions. Thermodynamic of these processes is considered at ideal ionite phase – the activity coefficients of absorbed ions in a solid phase haven't been taken into account.

Entropy of activation values were characterized by negative numbers in all cases. Expression of entropy of more selective processes by the minor values reveals itself also in the kinetics of these processes[4]. It has been determined that during sorption from solution with the same density sorption rate is higher in the more selective systems. The minor values of the entropy factor are the indicator of more rapid termination of processes. The lowest value of the entropy factor obtained in the system of Zn^{2+}- KB-4Px2 shows that in comparison with the other studied systems equilibrium has been established sooner in this system. If screening (with two pyridine links of imine nitrogen) of the ionite structure and functional groups is taken into account, it is possible to explain easily why the equilibrium at Dowex M4195 is established late in all cases. Calculations confirmed that during the sorption of metal ions by salt and acid ionite forms protonated forms of ionites are characterized by lower Hibbs energy than the salt forms. The values of equilibrium quantities, diffusion coefficients, exponential factor, sorption constants, activation energy and entropy, enthalpy, Hibbs energy and entropy factor characterizing the processes are specified in this report.

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Keywords: diffusion coefficients, equilibrium quantities, exponential factor, Hibbs energy and entropy factor, iomts ions, sorption isoterms

S-B4-003

EFFECT OF BULKY GROUPS AND π-π INTERACTION ON THE TACTICITY RELATIONSHIPS OF BULKY METHACRYLATES

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Controlling the stereochemistry of a polymer is highly demanded because it influences its physical properties such as the melting point, solubility, density, crystallinity and mechanical strength [1]. Experimental studies have demonstrated that methyl methacrylate (MMA) and other aliphatic methacrylic esters have a tendency to form syndiotactic rich polymers, presumably due to steric repulsion between the alpha-methyl groups and the ester groups [2]. However, the syndiotactic preference decreases, rather than increases, as the ester side chain becomes more bulky, to the extent that some exceptionally bulky monomers form highly isotactic polymers. In addition to this, aryl methacrylates behaves in different way while bulkiness of aryl methacrylates makes contribution to tacticity in another way. To clarify these inherent behaviors on tacticity of polymers, geometries and conformer distributions of monomers and oligomeric propagating radicals were modelled. The theoretical resutls are highly consistent with the experimentally observed trends [2]. Our quantum chemical study has demonstrated a correlation between the preference for meso propagation and the steric bulk of the ester side chain, where the latter is measured as the volume of the side chain. We have also confirmed that syndiotactic methacrylates prefer linear chains, isotactic methacrylates prefer helical chains and the increasing isotactic preference with chain length can thus be understood in terms of the increasing helical tendency as substituents become more bulky. It was demonstrated that, whilst π-stacking interactions in aryl methacrylates are significant to enhance syndiotacticity, the extent to which they influence the tacticity depends on their bulkiness and associated helical tendency. We have also provided an explanation for their solvent dependence in terms of the disruption of π -stacking conformations by the formation of inclusion complexes [3].

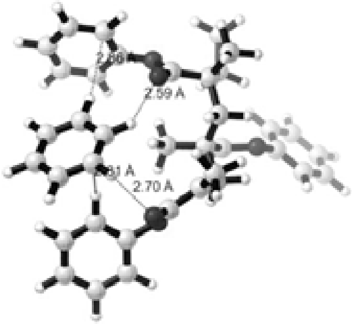

Figure 1: Solvent effect on the isotactic trimeric poly(PhMA).

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Keywords: Tacticity of bulky methacrylates, structure-reactivity relationship, quantum chemical calculation

S-B4-004

SYNTHESIS OF POLY (METHYL METHACRYLATE-B-*N*-ISOPROPYLACRYLAMIDE) THERMO RESPONSIVE BLOCK COPOLYMER BY REDOX AND ATOM TRANSFER RADICAL POLYMERIZATION

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Macromolecules of a desired structure and molecular weight can be synthesized by controlled/“living” radical polymerization (CRP) techniques. ATRP has a great number of advantages as compared with other CRPs [1]. Many redox pairs containing organic and inorganic components as polymerization initiator have been used successively [2]. PNIPAM having both the hydrophobic and hydrophilic amide group, isopropyl group in the side chain is one of the most extensively studied of temperature sensitive polymer [3]. In this study, poly (methyl methacrylate-b-*N*-isopropylacrylamide) [poly (MMA-b-NIPAM)] thermo responsive block copolymers were synthesized by a combination of redox and atom transfer radical polymerization (ATRP) methods in two steps. For this purpose, poly-MMA macroinitator (ATRP-macroinitiator) was synthesized by redox polymerization of methyl methacrylate (MMA) and 3-bromo-1-propanol. $Ce(NH_4)_2(NO_3)_6$ was used as a catalyst for the redox polymerization. The synthesis of poly (MMA-b-NIPAM) block copolymers was carried out by means of ATRP of ATRP-macroinitiator and NIPAM at 110 ^{0}C. The basic outline for the synthesis of block copolymer was shown in Scheme 1. Thermo responsive block copolymers were relatively obtained in high yield, molar weight and low molecular weight distribution. The principal parameters such as monomer-initiator concentration, and reaction time that affect the polymerizations were evaluated. The effect of the reactions conditions on the polydispersity and molecular weights was also investigated. The characterization of the products was achieved using ^{1}H-NMR, FT-IR, GPC, DSC, TGA, SEM and fractional precipitation [solvent (THF-mL)/non-solvent (petroleum ether-mL)] techniques.

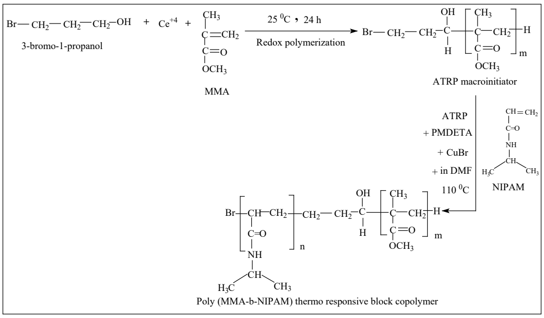

Figure 1. Reaction pathways in the synthesis of poly (MMA-b-NIPAM) thermo responsive block copolymer.

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Keywords: Atom transfer radical polymerization, macroinitiator, thermo responsive block copolymer.

S-B4-005

ELECTRORHEOLOGICAL PROPERTIES OF BIODEGREDABLE CHITOSAN/ EXPANDED PERLITE COMPOSITES

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Electrorheological (ER) fluids are composed of semiconducting or polarizable particles dispersed in a non-conducting liquid and regarded as smart materials because their flow behaviors can be tuned by externally applied electric field strength (*E*). They have been extensively studied because of their potential applications in many industrial areas such as control systems, human muscle stimulators, robotic arms, seismic controlling frame structures and photonic crystals [1]. Due to the importance of biopolymers in ER applications, particularly cellulose and chitosan have been examined as ER active materials. Chitosan (CS), which is a deacetylated chitin, is low in cost, has a stable performance, and belongs to an innocuous, biolytic and active polar amino group. Also, chitosan has been identified as an attractive biomaterial due to its plentiful resource, unique structure, low density, safety and biodegradability [2]. Perlite is a naturally occurring dense glassy volcanic rock which consists mainly of fused sodium, potassium, aluminum silicate (greater than 70%) and 3–5% water. When it is heated at temperatures in the range of 850–1100 °C, it expands 4–35 times of its original volume and is called 'expanded perlite'. Expanded perlite (EP) is an excellent thermal and acoustical insulator, resists fire, and is an ultralight weight material [3].

In this study, CS/EP composites were synthesized with three different chitosan concentrations (10%, 20% and 50%), as a new hybrid ER material. Structural and morphological characterizations of the composites were carried out by FTIR, XRD, TGA and SEM-EDS techniques. Some physical properties such as apparent density, particle size, antisedimentation stability and conductivity of the CS/EP composites were also determined. The effects of volume fraction, electric field strength, shear rate, shear stress, and temperature onto ER behavior of the CS/EP composite particles dispersed in silicone oil were investigated. It was observed that ER activities of the CS/EP/SO ER fluids increased with increasing electric field strength and exhibited the typical shear thinning non-Newtonian viscoelastic behaviors with increasing shear rates. Further, antisedimentation stabilities of the CS/EP/SO ER fluids were also determined to be perfectly suitable for potential ER applications.

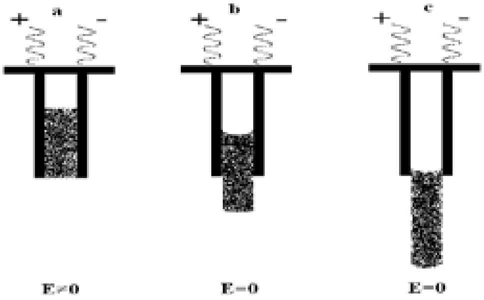

Figure 1: Schematic representation of an ER fluid with and without electric field strength (*E*).

Acknowledgements: The authors thank to TUBITAK (214Z199) for the financial support of this work.

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Keywords: Perlite, Chitosan, Polymer composite, Electrorheological fluids, Smart materials

S-B4-006

SYNTHESIS AND CHARACTERIZATION OF CELLULOSE BASED AEROGEL COMPSITE BIO-POLYMER MATERIAL ISOLATED FROM WASTE OF BLUEBERRY TREE (*VACCINIUM MYRTILLUS*)

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Today, composite materials take an important place in the industrial area due to their variety and advantages [1,2,3]. Some materials are inadequate to meet some physical and/or chemical properties required in the fields of application. When these materials are supported by another type of materials in various amounts, composite structures providing the required properties are obtained, which is a method commonly used nowadays. In recent years, peoples' interest in polymeric composite originating from cellulose obtained from vegetable wastes has gradually increased because of its gripping properties [4,5]. An important reason why cellulose products are preferred is that it provides composite materials with some advantages such as high strength and thermal insulation. Being organic substances, cellulosic waste materials also biodegrade in a short while and they do not have any disadvantages except their unaesthetic effects on the environment. Utilizing cellulosic waste materials and recycling them as new useful composite materials play a crucial role in contributing to the national economy. In addition, it decreases energy costs and consequently provides added value in Turkey where there are limited energy sources. In this regard, when the variety of sources is taken into consideration, it is aimed to use pruned branches and bushes of blueberries found abundantly in the Eastern Black Sea region, especially in Rize, as an economic value in Turkey. With this study, a new product which is biopolymer, eco-credential, biodegradable, low-cost, and flame-retardant was achieved using cellulose as a raw material obtained from wastes of the pruned blueberry tree, which is one of the important herbal products in the mentioned region. In addition to the structural and thermal characteristics, flame retardation and surface properties of cellulose/ aerogel (SA) biopolymer materials obtained from the study were determined with the help of the scanning electron microscope (SEM), thermal analysis (TG-DTG/DTA), surface area measurement techniques (pore size, volume, type, and surface areas) and x-ray diffraction and the results were compared to the commercial cotton which has mainly cellulosic structure.

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Keywords: Cellulose, Aerogel, Bio-polymer, Blueberry, Composite

S-B4-008

SYNTHESIS AND CHARACTERIZATION OF NOVEL METHACRYLATE DERIVATIVE MONOMER, HOMOPOLYMER AND COPOLYMER CONTAINING METHOXY GROUP

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Methacrylate monomers and polymers have been the most important commercial polymers since they have been used in different applications like glazing, lighting housing, bath tubs and structural adhesives. Methacrylate polymers have been high glass transition temperature (T_g) values and thermal stabilities. In recent years many studies have focused on aromatic methacrylate monomers and polymers especially aminomethacrylates for the presence of amine groups in the monomers eliminates the amino functional groups in the polymers. Different aminomethacrylate monomers synthesized [1-2]. Copolymerization has been most important method for effective changes in polymer physical and chemical properties for commercial application. Copolymerization has been able to used investigation of structure-property relationship [3].

In this study, methacrylate derivate monomer which containing methoxy group [2-(4methoxyphenylamino)-2-oxoethyl methacrylate (MPAEMA)] was synthesized by reaction of 2-chloro-N-(4-methoxyphenyl) acetamide with sodium methacrylate (TEBAC) and NaI as catalyst. Homopolymerization and copolymerization of this monomer with methacrylate were carried out by free radical polymerization in 1,4-dioxane solution using AIBN as initiator at 70 °C. Characterization of monomer, homopolymer and copolymer were performed by using spectroscopic methods (FTIR and ^{1}H-NMR). Molecular weight of the homopolymer was evaluated by gel permeation chromatography (GPC). The glass transition temperature and thermal stabilities of the homopolymer and the copolymer were investigated by DTA/TGA.

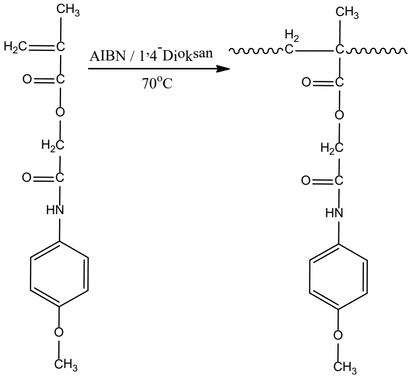

Figure 1: Synthesis of Homopolymer MPAEMA

Acknowledgements: The authors would like to thank The Research Foundation of Usak University (BAP) for financial support of this work. Project No: 2014/TP06.

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Keywords: Methacrylate Monomer, Homopolymer, Copolymer

S-B4-010

IMMOBILIZATION OF SCHIFF BASE METAL COMPLEXES ON POLY (PYRROLE-CO-O-ANISIDINE)/CHITOSAN COMPOSITE FILMS AND ITS ELECTROCATALYTIC ACTIVITY

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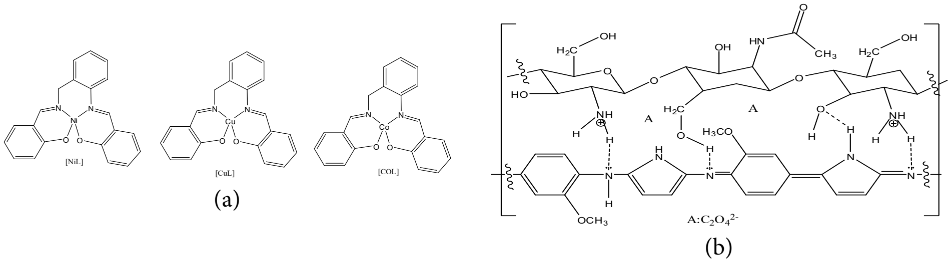
The copolymerization and composite formation have long been employed to improve various properties of the polymer films such as conductivity, thermal and electrochemical stability, mechanical properties etc [1]. There are made a number of studies on the synthesis of conducting polymer/biopolymer composites [2, 3].

Biosensor applications of conducting polymers/biopolymers composites for immobilization of enzymes have been intensely studied in recent times. However, enzymes are compounds which are easily decayed, expensive and hard isolated. Schiff bases metal complexes are a class of compounds that have been studied extensively because of their chemical and physical attractive properties. Films of several metal complexes produced on the metal surface, which are used as a catalyst, have become an important investigation area. For this reason, Schiff base metal complexes can be used as alternative materials replace enzymes in this area.

In this study; composite films were electrochemically synthesized in various monomer ratio solutions of pyrrole : o-anisidine was added 0.1 g chitosan of aqueous oxalic acid solution by cyclic voltammetry technique. Immobilization process was achieved in (M)II-(N,N'-bis(salicylidene)-2-aminobenzylamine (M-salabza) dissolved 0.15 M Acetonitrile-$LiClO_4$ solution by cyclic voltammetry technique at 0.2-2.0 V potential range. Sensor application of M-Salabza immobilized on poly(pyrrole-co-o-anisidine)/chitosan composite film experimented for NO_2^- ion and catechol.



(a)

(b)

Figure 1: The Structure of M-Salabza (a) and Poly (pyrrole-co-o-anisidine)/chitosan composite (b).

Acknowledgements: This Study has been supported by the Scientific and Technological Research Council of Turkey (TUBİTAK). (Project No: 112T523).

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Keywords: pirrole, o-anisidine, chitosan, composite, Schiff base

S-B4-011

THERMAL, MECHANICAL AND ANTIBACTERIAL PROPERTIES OF LDPE/ STARCH BIO-BASED POLYMER BLENDS FOR FOOD PACKING APPLICATIONS

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In recent years, growing environmental problems related to the accumulation of plastic waste and the huge consumption of nonrenewable resources for the production of plastics have shifted attention to the generation of more environmentally friendly biodegradable materials used in various applications such as food packaging, the automotive industry and biomedical applications. There is an especially great requirement the degradable packaging materials, because the packing sector is the largest single user of plastics [1]. Biopolymers obtained from renewable natural resources are preferred for the preparation of environmentally friendly and biodegradable packaging materials. However, due to their difficult processability, and poor mechanical and gas barrier properties, they are generally blended or reinforced with synthetic polymers. Using a proportion of biopolymers in synthetic polymer matrixes would not only reduce the dependence on petroleum products but also reduce the amount of plastic waste [2].

Among the biopolymers, starch is one of the most abundant two renewable natural biopolymer on earth and has been considered as promising material for the plastic packing industry. It is a natural carbohydrate material, and also has low cost, biodegradability, widely availability, compostability and non-toxic effect [3]. After plasticizing with water and glycerol, starch exhibits polymerization properties for extrusion, injection and compression molding. On the other hand, low density polyethylene, LDPE is the most commonly used synthetic polymer in food packing. It has high hydrophobic level, high molecular weight and highly branched chains. These branches make LDPE a flexible, stretchable material, and thus it is suitable for use as films in food packing.

In this study, we focused on gaining biodegradable and antimicrobial properties of LDPE films used in food packing. LDPE and starch were melt-blended to form biodegradable polymers by using extrusion method. The LDPE granules and the samples obtained by extrusion process were hot pressed in the films. After determining the starch ratio in LDPE, which provides a fine dispersion and protects the mechanical properties, nano-sized silver particles were used as antibacterial agent in these biodegradable polymer blends. The nanocomposites including the LDPE, starch and nano-sized silver were prepared via extrusion process, and then the nanocomposite films having biodegradable and antibacterial properties were formed by the hot-pressed film formation process. The structural analyze of the biopolymers were performed by FTIR. The bio-based polymer blends and nanocomposites morphologies were characterized by scanning electron microscope (SEM). Thermogravimetric analyzer (TGA) and differential scanning calorimetry (DSC) were used to analyze the thermal properties. The tensile tests of the samples were also performed by mechanical test machine. The water resistances of the bio-based polymer blends were examined by swelling studies and water contact angle measurements. Antimicrobial activities of the films were determined against gram-negative bacteria (E. coli) and gram-positive bacteria (S. aureus) by measuring the inhibition zone around each film.

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Keywords: bio-based polymers, food packing, antibacterial properties

S-B4-012

PREPARATION OF EGG WHİTE/POLYANILINE GEL ELECTRODES BY USING GAMMA-RAYS

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In this work gamma rays have been used for the formation of gels based on egg white, whilst aniline was polymerized simultaneously in the gel matrix. In order to increase the mechanical stability of the gels as well as to reduce the gelation dose ethyleneglycol dimethacrylate (EGDMA) was used as the cross-linking agent. Gels were prepared with egg white/EGDMA volumetric ratios of 1.0/0.001, 2.5/0.001 and 5.0/0.001 at the optimum dose of 10 kGy. Before irradiation of egg white aniline chloride and ammoniumpersulfate were added to the mixture at certain ratios. Polymerization of aniline and crosslinking of egg white in aqueous medium took place simultaneously with the synthesis of mechanically stable gels incorporating polyaniline inside homogeneously. The conductivity of prepared gels were measured and reported in the Table below. Wide range of conductivities were obtained in gels prepared with aniline depending on whether the gels were wet o dry while pure dry egg white gel was found to be nonconductive.

Albumen (ml)	EGDMA (ml)	Aniline-Cl (g)	APS (g)	σ Gel(as pepared) (S/cm)	σ Gel(dry) (S/cm)
1	0,01	0,01	0,01	$5x10^{-3}$	$1x10^{-5}$
2,5	0,01	0,01	0,01	$1,6x10^{-3}$	$1,1x10^{-6}$
5	0,01	0,01	0,01	$1x10^{-4}$	$1,8x10^{-8}$
1	0,01	-	-	$6,6x10^{-6}$	$6,6x10^{-9}$

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Keywords: Gel Electrodes, polyaniline, gamma rays

S-B4-013

FISH SKIN ISOLATED COLLAGEN CRYOGELS FOR TISSUE ENGINEERING APPLICATIONS: PURIFICATION, SYNTHESIS AND CHARACTERIZATION

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Tissue engineering aims regenerating damaged tissues by using porous scaffolds, cells and bioactive agents [1]. The scaffolds are produced from a variety of natural and synthetic polymers. Collagen is a natural polymer widely used for scaffold production in the late years because of its being the most important component of the connective tissue and biocompatibility. Cryogelation is a relatively simple technique compared to other scaffold production methods, which enables to produce interconnected porous matrices from the frozen reaction mixtures of polymers or monomeric precursors [2]. Considering these, collagen was isolated in this study from fish skin which is a non-commercial waste material, and scaffolds were produced from this collagen by cryogelation method. By SEM analysis, porous structure of collagen, and by UV-Vis analysis protein structure was proven, and by Zeta potential iso-electrical point of the protein was determined, and, Amit A, Amit B, Amit I, Amit II and Amit III characteristical peaks were demonstrated by FT-IR analysis. The collagen isolation yield was, 14,53% for acid soluble collagen and 2,42% for pepcin soluble collagen. Scaffolds were produced by crosslinking isolated acid soluble collagen with glutaraldehyde at cryogenic conditions. With FTIR analysis, C=N bond belonging to gluteraldehyde reaction with collagen was found to be at 1655 cm^{-1}. It was demonstrated by SEM analysis that collagen and glutaraldeyhde concentration had significant effects on the pore morphology, diameter and wall thickness of the cryogels, which in turned changed the swelling ratio and degradation profiles of the matrices. In this study, synthesis and characterization results of a fish skin isolated collagen cryogel scaffold that may be potentially used in the regeneration of damaged tissues are presented.

Acknowledgements: Partial financial support for “isolation of collagen” from The Scientific and Technological Research Council of Turkey (TUBITAK) within 2209 Programme is gratefully acknowledged. The cryogel production part was supported by the Scientific Research Projects Unit of Mersin University.

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Keywords: collagen isolation, cryogel, tissue engineering

S-B4-014

SOLUTION AND VAPOR- PHASE POLYMERIZATION OF ANILINE

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In this study, polymerization of the aniline monomers were carried out together, both in solution and vapor-phase. Ammoniumpersulfate (APS) solution was used as the initiator. In this particular method of polymerization, APS solution enables aniline and polypyrole monomers to polymerize both in solution medium and vapor phase. Therefore, this method is quite efficient and highly preferable for the polymerization of pyrolle and thiophene monomers. After the polymerization, spectroscopic analysis of the products were carried out by using SEM, FTIR, UV-vis spectrophotometer techniques and the conductivity of the products were measured by conductivity measurements. As a result, polymers that were produced by the vapor phase polymerzation had a conductivity greater than 1 S/cm, while the conductivity of the polymers produced in the solution was smaller than 1 S/cm.

Keywords: solution polymerization, vapor-phase polymerization, polyaniline

S-B4-015

HYDROXYETHYL METHACRYLATE BASED NANOCOMPOSITE HYDROGELS WITH TUNABLE PORE ARCHITECTURE

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Hydroxyethyl methacrylate (HEMA) based hydrogels have found increasing number of applications in areas such as chromatographic separations, controlled drug release, biosensing, and membrane separations. In all these applications, the pore size and pore interconnectivity are crucial for successful application of these materials as they determine the rate of diffusion through the matrix. 2-Hydroxyethyl methacrylate is a water soluble monomer but its polymer, polyHEMA, is not soluble in water. Therefore, during polymerization of HEMA in aqueous media, a porous structure is obtained as a result of phase separation. Pore size and interconnectivity in these hydrogels is a function of several variables such as monomer concentration, cross-linker concentration, temperature etc. In this study, we investigated the effect of monomer concentration, cross-linker concentration, graphene oxide addition or clay addition on hydrogel pore size, pore interconnectivity and mechanical properties. PolyHEMA hydrogels have been prepared by redox polymerization of the monomer using ethylene glycol dimethacrylate as a cross-linker. As a nanofiller, a synthetic hectorite Laponite® RD and graphene oxide were used. Graphene oxide was prepared by the Tour Method. Formation of oxygen containing groups was characterized by FTIR, UV-Vis spectroscopy, thermal gravimetric analysis, X-Ray photoelectron spectroscopy. Sheet like structure and single atomic thickness of the graphene oxide sheets were verified by scanning electron microscopy, atomic force microscopy. Pore morphology of the pristine and nanocomposite hydrogels were studied by scanning electron microscopy. The effect of the nanofillers on the mechanical properties of the gels was determined by rheological measurements. The formed hydrogels were found to be highly elastic and tough. A dramatic change in the pore structure and size was observed in the range between 20 to 30 wt/vol monomer at 0.5 % of cross-linker. In this range, the hydrogel morphology changes from typical cauliflower architecture to continuous hydrogel with dispersed water droplets forming the pores where the pores are submicron in size and show an interconnected structure. Such controlled pore structure is highly important when these hydrogels are used for solute diffusion or when there's flow through monolithic hydrogels. These robust hydrogels may be useful in separation and biomedical applications[1,2].

Acknowledgements: The author thanks TÜBİTAK for financial support (Grant Number: 114C068)

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Keywords: polymers, hydrogels, hydroxyethyl methacrylate, porous polymers, nanocomposites

S-B4-016

UNDERSTANDING THE SULFUR-CENTRED RADICALS BEHAVIOUR DURING SELF-HEALING MECHANISM

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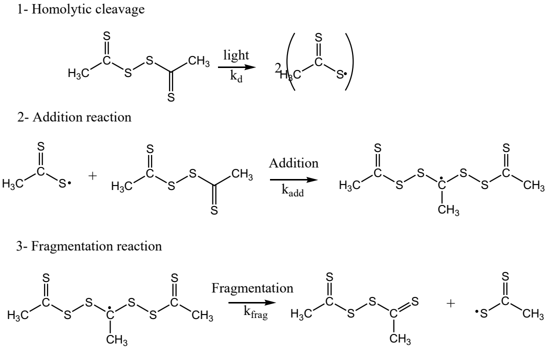
In recent decades, self-repairing or self-healing polymers have been developed so as to extend the working lifetime of materials[1]. These polymers generally utilize non-covalent bonding networks or dynamic covalent bonds that can be physically or chemically rearranged in response to external stimuli. Non-covalent bond forming systems leads to polymeric structures with weak mechanical properties[2]. On the other hand, dynamic covalent systems have the potential to regenerate the polymer backbone with high mechanical properties[3]. Dynamic covalent systems can be externally manipulated by chemical stimulation, thermal stimulation and photo stimulation[1]. Recently Amamoto et al.[1] introduced a covalently cross-linked polymer capable of undergoing visible light initiated self-healing. The photolabile groups in this system are thiuram disulfide linkages which undergo S-S bond cleavage in the presence of light to produce sulfur-centered radicals that can either recombine or undergo a series of addition-fragmentation chain transfer reactions, reminiscent of the RAFT process (see Scheme 1). In the latter case, the sulfur centered radical adds to the sulfur side of the S=C bond in another dithiuram linkage forming an intermediate radical that can then undergo β-scission, either to reproduce the reactants or a new "reshuffled" dithiuram linkage and a new sulfur-centered radical that can continue the process. The reshuffling of the covalent bond network can in principle occur purely by homolytic cleavage and subsequent recombination with a different sulfur-centred radical ("radical crossover"), but is thought to contain significant contributions from the chain transfer processes. In this study, we have used a computational chemistry to study the extent to which chain transfer contributes to the re-shuffling process, and examine the impact of changes to the chemical structure of the polymer. This presentation will highlight our results.



Scheme 1. Schematic representation of simply considered steps of self-healing procedure.

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Keywords: Sulfur centred radicals, Self-Healing Mechanism, Quantum Chemical Calculation, Ab-initio

S-B4-017

A NANO-SCALED NUCLEATING ADDITIVE FOR IMPROVING THERMAL INSULATION PROPERTIES OF RIGID POLYURETHANE FOAMS

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Polymer-clay nanocomposites have generated considerable interest because of their improved mechanical thermal, and physical properties at low clay loading. Rigid polyurethane foams (RPUFs) are a versatile class of polymeric materials and extensively used for thermal insulation, construction and packaging. Polyurethane foams are prepared by the polymerization of a polyol with an isocyanate. Reaction mixture is foamed using one or more blowing agent. In water blown foams, the polymerization reaction occurs along with the blowing reaction between isocyanate and water, which produces carbondioxide and blows the foam. The foam structure consists of large number of small cells. Insulation properties of cell structered RPUFs are largely dependent upon size and uniformity of the cell. It has been shown that the cell size of RPUFs can be controlled during nucleation and growth step of the foaming process. There are many researches trying to control the cell size some nucleating agents, which induce the formation of bubbles in the polymer matrix. Organo clays are accepted as nucleating agent for this purpose [1].

In this study, an organobentonite was prepared by using dimethyldioctadecylammonium bromide and the effects of the addition of this filler on the morphological, mechanical and thermal insulation properties of RPUFs were studied. Thermal insulation properties of RPUFs were investigated by thermal conductivity measurements. Cellular structure of foams was observed using a scanning electron microscope. The mechanical properties of the RPUFs were measured using universal test machine The addition of nanofillers resulted in reduced cell size and thermal conductivity. The effect of this cell size reduction on mechanical properties of RPUFs was also studied. It was shown that there was a considerable decrease in the thermal conductivity while there is no reduction in compressive strength.

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Keywords: Polyurethane foam, organoclay, thermal insulation

S-B4-018

THE EFFECT OF MOLDING TEMPERATURE ON THERMAL INSULATION AND MECHANICAL PROPERTIES OF RIGID POLYURETHANE FOAMS

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Rigid polyurethane foams are commonly used for insulation applications because they have better thermal properties than other common insulation materials. Polyurethane foams are prepared by the polymerization of a polyol with an isocyanate. Reaction mixture is foamed using a blowing agent. Conservation of energy and control of heat transfer are the main functions of thermal insulation. The thermal heat transfer in foams occurs by three main mechanisms such as conduction through the gas, radiation from cell walls and conduction through solid PU walls. The foaming process can be explained by nucleation and growth mechanisms. Size of the cells depends on number of the bubbles which are generated during the foaming. With growing concern for energy conservation, there is a strong incentive to improve the insulation property of rigid foams. This can be done by making foams with smaller cell sizes [1].

In this study, rigid polyurethane foams were obtained by mixing mechanically a certain amount of polyether-based polyol and polymeric 4,4'-diphenylmethane diisocyanate (pMDI) in a paper cup. After adding pMDI onto polyol, stirring was continued for 7-10 seconds. During this time blowing agent vaporized and foaming occurred. The mixture was poured into an aluminum mold and cured for 5 minutes. The effects of the different mold temperature on the morphological, mechanical and thermal insulation properties of foams were studied. Thermal conductivity values of the foams were measured using a thermal conductivity analyzer. The morphology of cell structure was examined by using a scanning electron microscope. The compressive strength of the rigid foams was measured using a universal test machine. Closed cell content of foams was also determined by a gas displacement pycnometer.

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Keywords: Compressive strength, molding, rigid polyurethane foam, thermal conductivity

S-B4-019

A NEW PLATFORM TO OBTAIN A SOLUBLE POLY(3,4-ETHYLENEDIOXY THIOPHENE)

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A new organic-inorganic hybrid monomer (EDOT-POSS) was synthesized by using nano-size support group polyhedral oligomeric silsesquioxane (POSS). The chemical structure of the monomer was investigated by nuclear magnetic resonance (H-NMR) and high resolution mass spectroscopy (HR-MS). EDOT-POSS monomer was polymerized electrochemically and the behavior of the polymer was investigated by cyclic voltammetry. In order to understand the effect of POSS unit on polymer chain, poly(3,4-ethylenedioxy thiophene) (PEDOT) polymer was studied under the same conditions. Spectroelectrochemical studies showed that the incorporation of the POSS unit enhanced the percent transmittance ($\Delta T\% = 74\%$ for 17 mC/cm^2 film thickness) and coloration efficiency (coloration efficiency is about 582 cm^2/C for the same film). The polymer film has highly transparent oxidized state and pure blue color at its reduced state. In addition to that, electrochemical stability of the PEDOT-POSS polymer was superior to that of neat PEDOT (for the films coated on Pt electrode with the thickness of 64 mC/cm^2, while PEDOT-POSS could maintain 93% of its activity, PEDOT has lost its all activity after 5000 cycle).

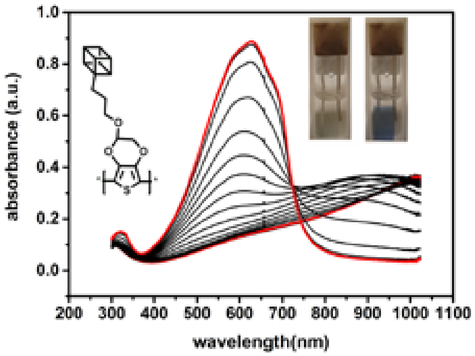

Figure 1: Electro-optical spectra of PEDOT-POSS film on ITO under external potential between -0.6V and 1.0V in an electrolyte solution of 0.1 TBAH dissolved in ACN.

Acknowledgement: Autors acknowledge Atilim University for funding this project (ATÜ-BAP-A-1314-01) through Atilim Optoelectronic Materials and Solar Energy Laboratory (ATOMSEL).

Keywords: Electrochromism, 3,4-ethylenedioxy thiophene, EDOT, Polyhedral Oligomeric Silsesquioxane, POSS

S-B5-001

SOME NEW APPLICATIONS IN SOLID STATE CHEMISTRY OF CHEMICAL HARDNESS AND MOLAR VOLUME CONCEPTS

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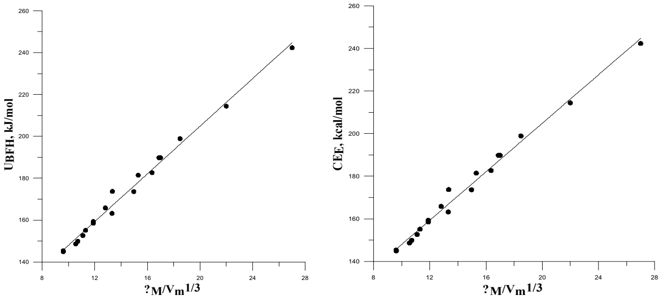
Chemical hardness is defined as the resistance towards electron cloud polarization and deformation of chemical species [1]. In the description of different characteristics of chemical species related to their chemical bonding, stability and reactivity, popular chemical concepts like hardness (η) and molar volume (V_m) are commonly used. Maximum Hardness (MHP) [2,3] and Minimum Polarizability (MPP) [4] Principles are two useful electronic structure rationalizing tools in chemistry. Maximum Hardness Principle proposed by Pearson states “there seems to be a rule of nature that molecules arrange themselves so as to be as hard as possible.” As an extension of MHP, Sengupta and Chattaraj argued a Minimum Polarizability Principle (MPP) which states that “the natural direction of evolution of any system is toward a state of minimum polarizability.” It can be thus noted on the light of these electronic structure principles that chemical systems having high chemical hardness and low polarizability are energetically favored (i.e., become more stabilized). In recent years, in the light of MHP and MPP, we derived and introduced new and useful equations to calculate the lattice energy and cohesive energy of inorganic ionic crystals [5,6]. In the derivation of lattice energy (U) and cohesive energy (CE) equations, we considered and used the $\eta_M/V_m^{1/3}$ ratios for inorganic ionic crystals as an indicator of their stability. Here η_M represents the molecular hardness of a ionic crystals and is calculated via Kaya molecular hardness equation [1]. In this oral presentation, our new methods (based on chemical hardness and molar volume concepts) proposed for the calculation of lattice energy and cohesive energy of inorganic ionic crystals will be introduced. Then, the advantages of our new methods compared to previous methods will be explained. Some graphs showing reliability of proposed methods are given below (U_{BFH} and CE_E stands for experimental lattice energy and experimental cohesive energy).



Figüre 1. Graphs of correlation with their $\eta_M/V_m^{1/3}$ ratios of cohesive energy and lattice energy of alkali halides

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Keywords: Chemical Hardness, Molar Volume, Lattice energy, cohesive energy, solid state chemistry, inorganic ionic crystals

S-B5-002

CRYSTAL STRUCTURE AND COMPUTATIONAL STUDY OF $C_{13}H_{10}N_2O_3$

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Schiff bases are potentially biologically active compounds and have been reported to possess antifungal, anticancer, anticonvulsant and diuretic activities [1]. Diffraction data was collected using MoKα radiation on a Stoe IPDS 2 diffractometer at 296 K. The crystal structure was determined with directs methods and were refined by the full matrix least squares method to R=0.099. Crystal data: Triclinic, P a=12.3449(6), b=13.4266(6), c=15.7404(7), β=67.390(4)° ve V=2282.7(2)Å^3. In the crystal, molecules are linked into layers lying parallel to (024) by C—H...O and O—H...O interactions.

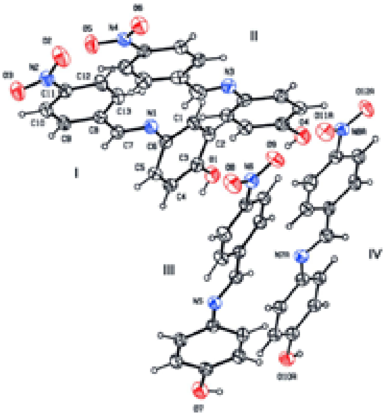

Figure 1: The molecular structure of the title compound (I) with displacement ellipsoids drawn at the 20% probability level. Only the major component of the disorder is shown.

The layers interact by C—H... π and weak aromatic π – π stacking interactions [centroid–centroid distances = 3.8476 (16), 3.725 (3) and 3.733 (5) A °][2]. Theoretical calculations of the molecular structure using the CNDO approximation and MOPAC PM3 geometry optimization are in satisfactory agreement with the results of the X-ray structure analysis [3].

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Keywords: crystal structure, whole-molecule disorder, nitroaromatic compounds, hydrogen bonding, C-H...π interactions, π – π stacking interactions

S-B5-003

COATING OF RETRO-REFLECTIVE GLASS BEADS WITH MONTMORILLONITE

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Road lines, easily visible during the day, can be also visible in the dark night due to glass beads located on the paint surface. The glass beads reflect light back to the headlights in the dark, which ensure road marks to be seen easily. The situation that the incident light to be reflected back to the light source, is called as "retroreflectivity".

As vehicles roll over road marking paint, glass beads having larger sizes are removed from the surface due to the impact made by the friction of the vehicles. Small glass beads begin to appear on the paint surface due to the wear of paint over time. Consequently, night visibility decreases eventually. For longer night visibility, Strong affinity is needed between glass bead surface and paint. To ensure this affinity, the glass spheres are coated with different materials that can provide high compatibility between glass bead and paint [1,2,3].

In this study, glass beads were coated with nano sized natural montmorillonite and organically modified montmorillonite. Afterwards, performances of these glass beads were compared to uncoated glass beads and commercial glass beads. Glass beads were spread on the water based paint which had been applied on 10 x 50 cm briquettes, soon after the paint applying process. Ratio of glass beads to paint is 33 % by weight. After paint dries, in order to simulate the way, a wheel with 6 bars pressure shuttles on the paint at 10.000 cycles. At the end of this process, night visibilities are measured. After 10.000 cycles of shuttling, night visibility of paint including water based montmorillonite coated glass bead is higher than the paints including commercial or uncoated glass beads.

This study has a high importance since using this natural material for the glass bead coating is first in literature.

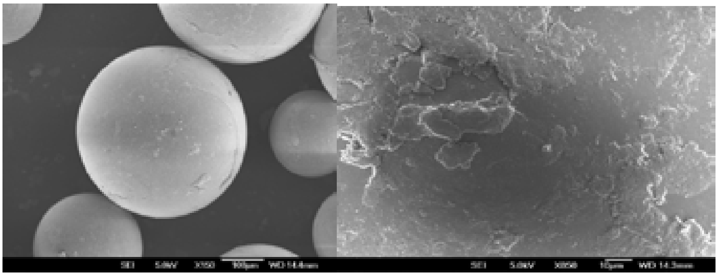

Figure 1: SEM images of montmorillonite coated glass beads.

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Anahtar Kelimeler: cam küre, yol çizgi boyası, montmorillonit

S-B5-004

DEVELOPMENT OF COMPOSITE POLYURETHANE FOAM USING ENVIRONMENTALLY FRIENDLY MATERIALS

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Due to the rapid increase in population growth, energy and synthetic material consumption are increasing rapidly day by day. Therefore, the materials which reduce energy consumption like isolation materials have been gaining an importance through innovative research. So far, the most part of energy reducing materials have been producing by synthetic chemicals and therefore have a detrimental effect on the natural world and living organisms. Rigid polyurethane foam (PUR) is manufactured by synthetic raw materials and widely used as an isolation material for different applications. The purpose of this study is to reduce the usage of synthetic raw materials which are used to produce PUR and incorporate natural materials in order to decrease the harmful effects of the synthetics. Resulted composite PUR foams demonstrated the similar thermal and physical properties, while increase the ecological and natural sustainability.

Polyol and isocyanate are the main chemicals for the production of PUR foams. They affect its properties significantly. Basalt, straw and glass fibers were combined with PUR foam during the manufacturing at 0.5, 1, and 2 % with various fiber sizes.

Figure 1: 1% glass fibre composite PUR

The mechanical properties remained at almost the same values with virgin PUR foam. It was observed that there is no any significant difference in physical properties among the virgin PUR and the resulted composite foams including the natural additives. In addition to that during the production, it was difficult to obtain homogeneous mixture and the cell morphology was deteriorated when we increased the proportion of the natural fibers. This alteration affected negatively the mechanical properties and the coefficient of thermal conductivity. Thus the optimum production parameters were determined after many trials. The coefficients of thermal conductivity of all samples showed the similar value to the reference PUR foam. The best result for thermal conductivity was achieved as 0.02109 W/m.K by using 1 % glass fiber. Based on our observations, better thermal conductivity and mechanical properties can be obtained with using nano-based additives via injection method. On the other hand, it is estimated that 96 million tons of PUR foam was produced in 2015. By using this simple, cost efficient and practicable method, an approximately 100 thousand tons of synthetic chemicals can be saved by only adding 1% natural fibers. It is considered this result will generate an important positive effects on living creatures, environment and economy as well.

Acknowledgment: The authors are thankful to Arcelik Plant in Eskisehir, Turkey.

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Keywords: polyurethane foam, environmentally friendly, simple, cost efficient

S-B5-005

ANALYSIS OF RUBBER MIXTURES TO INVESTIGATE EGR (EXHAUST GAS RECIRCULATION) - BLOW BY STRENGTH AND DEVELOPMENT OF NOVEL RUBBER COMPOUNDS

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Increasing the number of vehicle caused environmental polluting gas emissions a significant increase day by day. The pollution caused by exhaust emissions emitted by motor vehicles, is one of the major factors that lead to air pollution in recent years [1]. This situation has made necessary the development of emission control technologies. There are three systems in car for the controlling emissions. These are crankcase emissions system, evaporative emissions system and exhaust emission control system [2]. From these systems, the positive crankcase ventilation and low pressure exhaust emissions systems gas cycles occur in rubber and plastic hose [3]. In this work, Blow by and EGR (exhaust gas recirculation) gas which circulate in positive crankcase ventilation and exhaust emission control system, effect on rubber hose was investigated.

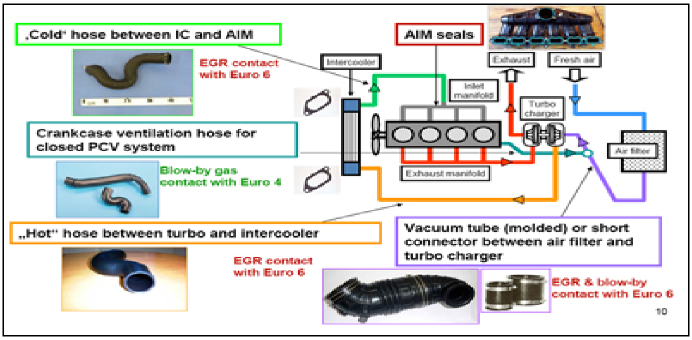

Figure 1: Positive crankcase ventilation and low pressure exhaust emissions systems with rubber hoses.

CR, CM, AEM, ACM and FKM compounds, 24 hours, 72 hours and 168 hours at different pH values, different acids and fatty components and the condensate solution is formed from the ratio of liquid and gaseous phases were heated at 150 °C 100 °C, 120 °C in an autoclave. The mechanical properties of all samples were investigated. The hardness measurements were performed in both dried and undried condition according to VDA675102 standard. Tensile strength and % elongation tests were conducted by VDA675310. The volume changes of the samples were also observed. All elastomer have been compared with the results of each test sample was exposed to the same conditions, blow by and EGR strength properties were analyzed and mixture formulation work for the development of strength properties of the compounds were carried out. As a result, chlorine based elastomers are shown worst performance in the blow-by and EGR strength tests. Although acrylic based elastomers have been better performance than chlorine based elastomers compounds, best strength has been observed in fluorocarbon elastomers.

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Keywords: Emission, EGR, Blow by, Elastomer

S-B5-006

INVESTIGATION OF IMPURITIES IN THE ULEXITE DISSOLUTION PROCESS VIA TAGUCHI METHOD

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Ulexite has many usage areas at several industrial processes such as production of chemicals, fibers, composites, flame retardants and glass [1]. Ulexite has a very low solubility in water. Therefore, there are many studies were conducted on dissolution of ulexite in aqueous solutions. Some of the recent studies are relevant to dissolution of ulexite in oxalic acid solutions [2], in phosporic acid solutions [3], in ammonium acetate solutions [4], in citric acid solutions [5]. Impurities in the ulexite ore transfer into the aqueous medium during dissolution process. These impurities drastically affect the final product quality; additional purification or recrystallization processes are required.

In this study, granulated ulexite ore were dissolved in aqueous medium with %99.99 sulfur dixoide gas in an atmospheric batch reactor. Five parameters which have four leves were used in the experiments. Dissolution parameters were determined as solid/liquid ratio, reaction temperature, pH, particle size, reaction time. Taguchi experimental design was preferred for the experimental applications. L_{16} (5^4) orthogonal array was used for experimental runs. Effects of dissoltion parameters on the concentrations of Fe, Mg, Ca and SO_4 in the aqueous phase were examined by Taguchi orthogonal arrays. Minitab® statistical software was used to obtain main effects plots.

It was observed that the concentrations of Fe and SO_4 in the aqueous medium were affected by pH synergystically. Mg concentrations in the aqueous medium were affected synergystically while SO_4 concentarions aqueous medium were affected antagonistically with sold/liquid ratio. Ca and Fe concentrations in the aqueous medium were affected antagonistically while Mg concentarions aqueous medium were affected synergystically with sold/liquid ratio. It is concluded that dissoltion parameters used for dissolution of ulexite in aqueous medium affect the concentrations of impurities which were investigated in this study.

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Keywords: Taguchi method, ulexite, dissolution, so2, sulfur dioxide, impurity

S-B5-007

CREATING OF A SKIN MIMICKING MATERIAL FOR MEDICAL IMPLANT APPLICATIONS OPERATING IN THE MICS AND ISM BANDS, AND AN EXEMPLARY ANTENNA RETURN-LOSS MEASUREMENT FOR TESTING PURPOSE

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In recent years, demand for utilization of wireless telemetry systems in medical technology has significantly increased due to needs for early diagnosis of diseases and continuous monitoring of physiological parameters (glucose, blood pressure, temperature, etc.) [1,2]. Antennas are the key components of these telemetry systems since they provide the communication between the patient and base station. Designing antennas for implantable systems is quite challenging for researchers due to antenna size, impedance matching, low power requirements, and biocompatibility with the body's own physiology [2].

In this study, we are intended an implantable antenna design (see in Fig. 1) that is placed into a skin mimicking material. To test the antenna in-vitro, mimicking gels/ liquids were made that show electrical properties real skin tissue (relative permittivity (e_r) and conductivity (s)) for the operation frequencies of ISM (Industrial, Scientific, and Medical, 2.4 GHz–2.48 GHz) and MICS (Medical Implant Communications Service, 402–405 MHz) bands. To create required gels, we have used Agarose, DGBE (Diethylene glycol butyl ether), Triton X-100 (polyethyleneglycol mono phenyl ether), deionized water, NaCl, and sugar chemicals. The gels/ liquids were obtained by mixing different proportions of different chemicals for human skin tissue samples suggested in [3,4]. Skin mimicking material samples with different content were prepared to see the practical performance of the antenna. The return loss (S_{11}) measurements of the antenna have been performed by placing in to the skin mimicking gel/ liquids. The measurements taken in the 1 GHz - 5 GHz frequency band. The measurement results obtained is seen to be in consistency with simulation results in the interested frequency bands.

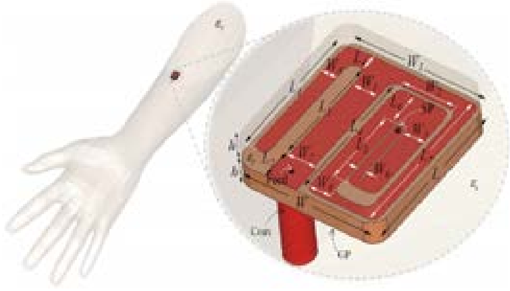

Figure 1: The microstrip antenna configuration used for skin mimicking material testing purpose.

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Keywords: antenna, mimicking gels/ liquids, ISM, MICS

S-B5-008

PREPARATION AND CHARACTERIZATION OF MONTMORILLONITE/ POLYCAPROLACTONE COMPOSITE SCAFFOLD CONTAINING STRONTIUM FOR BONE TISSUE ENGINEERING STUDIES

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The design and production of scaffolds for bone tissue regeneration is an important healthcare objective due to the drawbacks of treating defects with bone autografts. In recent years, polymer clay technology has been started to be use to meet bone tissue engineering (BTE) application requirements. There are four main groups of clays: kaolinite, montmorillonite-smectite, illite and chlorite. Among them montmorillonite (MMT) has received a great deal of attention for use with implantable biomaterials [1]. Addition of MMT to polycaprolactone (PCL) scaffolds (PCL/MMT) has generated interest to improve mechanical properties for BTE applications. Sr^{2+} is one of the trace elements in the human body which plays an important role in osteogenesis and the maintenance of bone. Incorporation of Sr^{2+} into the TE matrices and its subsequent sustained release may have an positive effect the proliferation of osteoblastic cells and provide an optimal means to engineer tissues [2]. Due to the intrinsic ability of MMT to incorporate cations, we developed scaffolds combining PCL and strontium-modified MMT (PCL/Sr-MMT) to further utilise the osteoconductive properties of strontium. For this purpose, MMT was (i) modified with strontium, and then characterized (ii) blending with polycaprolactone (PCL) in specific ratios by using particulate leaching technique to obtain bone tissue-like biocomposite scaffolds. The macrostructure and morphology were characterized by X-ray diffraction (XRD), fourier transform infrared spectroscopy (FTIR), thermogravimetric analysis (TGA) and scanning electron microscopy (SEM). The mechanical properties were also evaluated. The release of $Sr^{2+}$from the non-modified and modified scaffolds into cell culture medium was determined by inductive coupled plasma optical emission spectrometer (ICP-OES). The pore size distrubition of scaffolds was determined by mercury intrusion porosimetry. The results of FTIR and XRD confirmed intercalation of PCL into MMT layers. TGA studies concluded that the MMT in PCL promoted the thermal degradation of the matrix. ICP results showed that Sr^{2+} was released from composite scaffolds. The majority of pore volume seems to be occupied by pores around 250-350 mm. SEM observations demonstrated the macroporous structure of the PCL/MMT sponges obtained by using the freeze-drying method. The composite sponge showed a highly porous morphology with interconnected pores. Morphological observation by SEM indicated homogeneous dispersion of MMT throughout PCL matrix. As a result, gained data suggests that obtained tissue-engineered template have the potential to serve as a suitable templete for bone tissue engineering application.

Acknowledgements: Financial support has been provided by TÜBİTAK-1002.

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Keywords: Montmorillonite, Polycaprolactone, Strontium, Bone tissue engineering

S-B5-009

ANALYSIS OF THE EFFECTS OF DIFFERENT ADDITIVES ON BASE OILS

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Lubrication process is made in all movable mechanical parts to build a film between two surfaces in contact to reduce friction. Oils used for this purpose are produced by adding certain additives to base oils, which are produced by distillation of crude oil. Such oils are not only required to reduce friction between two metals but also expected to keep the film layer that they have built at every temperature to maintain their features and consequently, to have long usage life. In the present study, effects of different additives on base oils in lubricants were investigated. These additives are oil-soluble polymer-based materials and ensure less change in viscosity of oil-polymer solution versus time because their solubility increases with the increased working temperature. This principle is used in all lubricants like engine oil, hydraulic oils, gear box oil and differential oil. Optimum addition ratios for different additives were specified and features of the new blend were examined. The findings indicated that high viscosity index in lubricants builds a stronger film layer and makes the lubricant have longer life. It was understood that olefin-copolymer type polymer, which is one of the used polymers, reduces interaction between oil and temperature even in low amounts and therefore, it raises viscosity index. Furthermore, another finding is that the polymer with high molecular weight raises the viscosity index more compared with the polymer with low molecular weight. It was observed that polymethacrylate polymer, which was used in increasing viscosity index, decreased pour point at the same time. It was observed in the conducted engine tests that olefin type polymer (olefin copolymer) increased wear and therefore, more antiwear additive was needed. [1,2].

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Keywords: Base oil, additives, viscosity, physical properties, polymer

S-B5-010

FILMS CONTAINING UPCONVERSION PHOSPHORS WHICH CAN BE USED AGAINST PATHOGENIC MICROORGANISMS

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Ultraviolet (UV) radiation is an effective mean in combating pathogenic microorganisms since it has direct mutagenic effects on DNA and does not yield harmful or environmentally persistent chemical residuals. Electricity-powered UV lamps have been successfully used in water, air, or surface disinfection. However, materials which passively emit small quantities of UVC without requiring electricity or devices would provide advantages in more widespread use of this mean in preventing spreading of fomitic diseases and thus offering direct advantages in protecting public health and food processing. Studies revealed that non-porous surfaces (i.e, door knobs) are better than porous and especially fibrous materials in transmitting bacteria and viruses since the latter absorb and trap the contagion better [1,2].

Recently praseodymium -$Y_2SiO_5:Pr^{3+}$- phosphors, which are capable of emitting UVC upon excitation by blue light, as an upconversion (UC) activator, have been successfully prepared and their surface anti-microbial behavior have been studied [3]. In present study, $M_2SiO_5:Pr^{3+}$ (M:Y, La) upconversion phosphors have been prepared by solid state reaction method and caharacterized by XRD, PL techniques. The studies on films made from these phosphors via electrospraying were performed. The prepared films were caharacterized by FT-IR spectrommetry.

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Keywords: Upconversion, phosphors, antibacterial films

S-C1-001

A NEW BIOMATERIAL BASED Pd(II) CATALYST FOR GREEN SYNTHESIS OF BIARLYS IN SUZUKI COUPLING REACTIONS

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Suzuki cross-coupling reactions are one of the fundamental methods employed in the synthesis of biaryls [1]. However, Suzuki coupling reactions require high long reaction time, reaction temperature, large amounts of energy, labor-intensive nature and high operational costs [2]. To improve these drawbacks, microwave heating technique and natural biopolymer are popularly utilized for Suzuki coupling reactions. Especilay, chitosan supported catalysts have attracted much attention due to their non-toxicity, biodegradable, eco-friendliness, and high metal adsorption capacity features [3]. In the present study, for the purpose, a new chitosan supported environmental palladium catalyst was synthesized and characterized using FTIR, ^{1}H NMR, ^{13C} NMR, TG/DTG, SEM/EDAX, XRD, ICP-OES, UV–Vis, magnetic moment, and molar conductivity techniques. Then, the catalytic activity tests of this catalyst were conducted in green synthesis of biaryl compounds under mild conditions. The method involved a very short-time microwave irradiation at low temperature in the absence of any chemical. The catalyst exhibited high activity and selectivity with low catalyst loading by giving higher TON and TOF values. As a consequence, biomaterial supported catalyst has superior properties such as long lifetime, high thermal stability, easy removal from the reaction mixture and durability in the presence of oxygen.

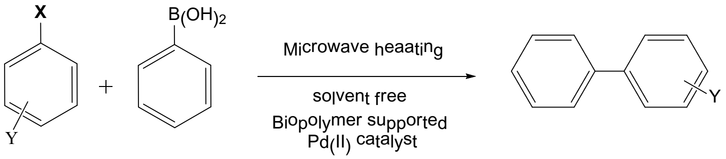

Figure 1: Synthesis pathway for biarlys compounds

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Keywords: Chitosan, Suzuki coupling reactions, microwave heating, biomaterial, solvent free

S-C1-002

SYNTHESES OF CHIRAL IONIC LIQUID BASED Ru(II)-PHOSPHINITE COMPLEXES AND INVESTIGATION OF THEIR CATALYTIC ACTIVITY IN ASYMMETRIC TRANSFER HYDROGENATION OF KETONES

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Recently, room-temperature ionic liquids, containing 1,3-dialkylimidazolium cations and their counter ions, have attracted considerable attention [1,2]. These ionic liquids are potential replacements for organic solvents both on laboratory and industrial scales due to their green characteristics such as thermal stability, lack of vapour pressure, non-flammability, wide liquid range, wide range of solubility and miscibility [3]. Furthermore, modified *P*-based ligands have important applications in organometallic chemistry and catalysis, giving selective catalysts for hydroformylation, hydrosilylation and transfer hydrogenation [4,5].

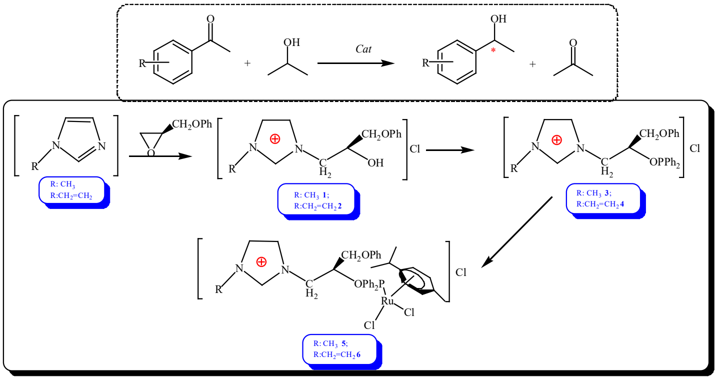

Figure 1. Syntheses of the compounds **1-6**

In present study, chiral ionic liquids (**1**,**2**) and their phosphinite ligands (**3**,**4**) were synthesized. Ru(II) complexes (**5**,**6**) were then obtained by the reaction of the phosphinite ligands with [Ru(*p*-cymene)Cl_2]$_2$. The complexes were characterized by a combination of multinuclear NMR spectroscopy, IR spectroscopy, and elemental analysis. Catalytic activity of the Ru(II) complexes were investigated in asymmetric transfer hydrogenation of ketones.

Acknowledgement: This study was supported by Dicle University Research Fund (**FEN.15.021** and **FEN.15.022**).

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Keywords: Phosphinite, Ru(II), Asymmetric Transfer Hydrogenation, Catalysis

S-C1-003

HETEROLEPTIC m-NITRIDO DIIRON PHTHALOCYANINES as OXIDATION CATALYSTS

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Phthalocyanine metal complexes are important candidates for several oxidation reactions [1]. μ-nitrido diiron phthalocyanine emerges as promising power oxidation catalysts. This complex has a Fe^{III}-N=Fe^{IV} structural unit and is a $Fe^{3.5}$-N-$Fe^{3.5}$ mixed valence compound with equivalent iron atoms [2-4]. This can be modified depending on the substitution pattern [5].

μ-Nitrido diiron phthalocyanine complexes oxidize molecules with strong C-H bonds such as methane and benzene [6-8]. To determinate which factors direct the formation of the activated iron (IV)-oxo intermediate, we designed heteroleptic μ-nitrido diiron phthalocyanines with non-equivalent iron sites[9].

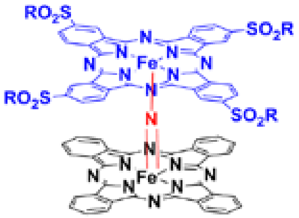

Figure 1: μ-Nitrido bridged diiron phthalocyanines (R = Hexyl, Adamantyl)

These complexes were tested in oxidation of methane into formic acid. The preferred formation of iron-oxo complex was observed at the more electron-rich iron site. This is an important insight for the future design of improved derivatives [9].

Acknowledgements: The Scientific and Technological Research Council of Turkey (TUBITAK) is gratefully acknowledged for the funding of these studies (project 112M370).

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Keywords: heteroleptic, nitrido, diiron, phthalocyanine

S-C1-004

CHIRAL MONODENTATE AND BIDENTATE FERRROCENYL BASED METAL-PHOSPHINITE COMPLEXES AND THEIR CATALYTIC ACTIVITY IN TRANSFER HYDROGENATION REACTION

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The ferrocene moiety has been extensively explored as a backbone of chiral P based ligands due to its easy modifiability and highly electron donating property. The excellent structure of ferrocenes enables us to design a variety of chiral ferrocenyl P based ligands, which are useful tools in metal-catalyzed asymmetric reactions [1]. Because of its great success in catalytic asymmetric reactions [2], chiral ferrocenyl-phosphine ligands have attracted considerable attention in recent years [3,4].

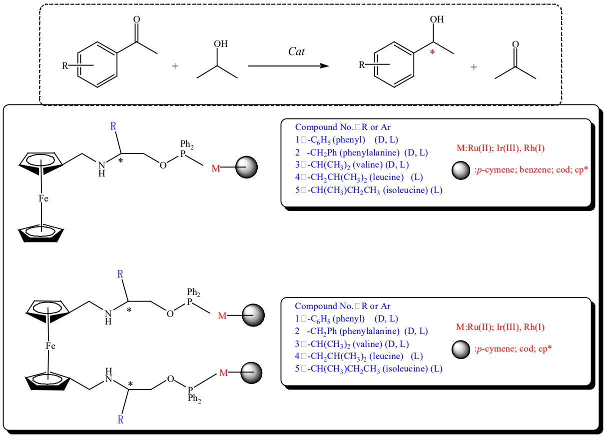

Figure 1. Chiral ferrocenyl P based complexes

We have synthesized new metal complexes of chiral ferrocenyl monodentate [5] and bidentate phosphinite [6] ligands and used them as catalysts in asymmetric transfer hydrogenation of various ketones.

Acknowledgement: This study was supported by Dicle University Research Fund (**09-FF-64**, **FEN.15.021** and **FEN.15.022**) and by the Scientific and Technological Research Council of Turkey (**111T419**).

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Keywords: Ferrocene, phosphinite, asymmetric transfer hydrogenation

S-C1-005

N-BUTYL SUBSTITUTED N-HETEROCYCLIC CARBENE-PD(II)-PYRIDINE (PEPPSI) COMPLEXES: SYNTHESIS, CHARACTERIZATION AND CATALYTIC ACTIVITY IN THE SUZUKI-MIYAURA REACTION

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N-Heterocyclic carbenes (NHCs) are a well establish class of important ligands in organometallic chemistry [1]. The ancillary ligand (NHC) coordinated to the metal center has a number of important roles in homogeneous/heterogeneous catalysis, such as providing a stabilizing effect and governing activity and selectivity by alteration of steric and electronic parameters [2].

Pd-NHC complexes have been extensively utilized in catalytic formation of carbon-carbon and carbon-heteroatom bonds as efficient catalysts [3]. Since the first example PEPPSI type (**PEPPSI**= Pyridine-Enhanced Precatalyst Preparation, Stabilization and Initiation) Pd-NHC complexes were reported by Organ et al in 2006, considerable efforts have been undertaken to develop these type complexes because they are easy-prepared, air- and moisture-stable [4,5].

In this context, three novel PEPPSI type N-butyl functionalized N-heterocyclic carbenes (NHC) complexes were synthesized and characterized. Also the catalytic activity of Pd(II) complexes were examined in Suzuki-Miyaura reaction.

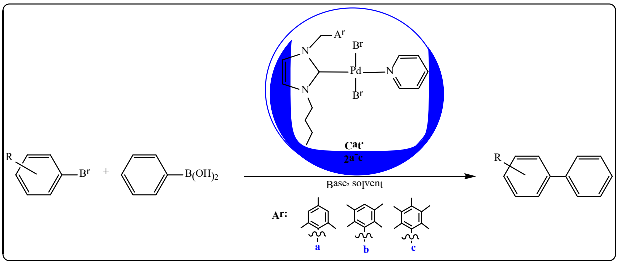

Figure1: Suzuki-Miyura coupling reaction of aryl bromides with phenylboronic acid catalyzed by **2a-c**

Acknowledgements: This work financially supported by the Technological and Scientific Research Council of Turkey [110T765].

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Keywords: Suzuki-Miyaura coupling reaction, N-heterocyclic carbene, PEPPSI palladium complexes

S-C1-006

CATALYTIC INVESTIGATION OF IONIC LIQUIDS AND THEIR SILVER COMPLEXES

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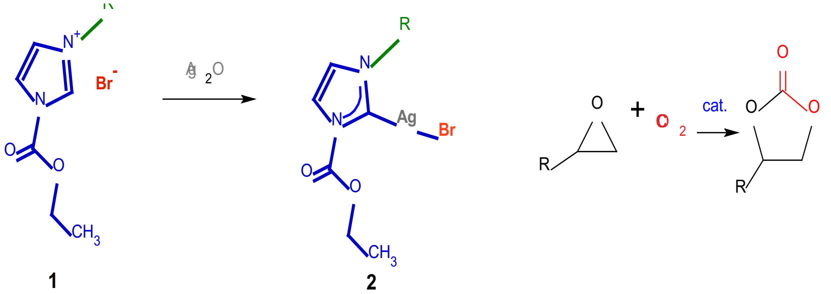
Synthesis of cyclic carbonates is a useful reaction pathway while reagents are carbon dioxide and epoxides. Utilization of carbon dioxide as a building block of chemicals is mostly desirable in view of environmental and atom economy aspects.

Application of ionic liquids as a catalyst is favorable process because of their usage as both catalyst and solvent. Silver N-heterocyclic carbene (Ag-NHC) complexes have been used in medicinal applications [1], transmetallation [2], catalysis [3] and nanomaterials [4]. Among these, the evaluation of Ag-NHC complexes as catalyst are not very common. A seminal study in this area is the work of us, Ag-NHCs act as highly efficient catalyst for the chemical addition of carbon dioxide to epoxides without base.

In this study we synthesize ionic liquids bearing ester functional group and silver complexes of these ionic liquids (Figure 1). Synthesized compounds were characterized by ^{1}H - ^{13}C NMR and elemental analysis, after that they were employed as catalyst for the chemical fixation of carbon dioxide and terminal epoxides. Optimization of catalytic reaction conditions was also investigated by altering temperature, pressure of carbon dioxide, amount of catalyst and time.



1 **2**

a) *b)*

Figure 1: a) Structures of synthesized compounds b) Model catalytic reaction

Acknowledgements: We wish to thank the scientific and technological research council of Turkey (TUBİTAK-212T058) for financial support.

References:

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Keywords: Ag-NHC, cyclic carbonate, ionic liquid

S-C2-001

GOLD-CATALYZED AND NaH-SUPPORTED CYCLIZATION REACTIONS OF *N*-PROPARGYL PYRROLO AND INDOLE DERIVATIVES

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Heterocycles are the most important structural classes of chemical compounds [1], and they are particularly well represented among agrochemicals, natural products, and pharmaceuticals. It is estimated that more than 70% of all pharmaceutical products possess heterocyclic structural subunits [2]. Ring closure reactions, in which a new carbon-heteroatom bond is formed, are a commonly used approach in the synthesis of heterocycles [3]. Specifically, the intramolecular addition of a nitrogen functionality to an alkyne or an alkene is a valuable strategy [4]. Herein, we report a synthetic methodology that enables efficient access to the construction of five-, six-, and seven-membered heterocyclic rings, via intramolecular ring closure reactions. The key features of this method include (i) synthesis of pyrrole or indole-derived *α,β*-alkynyl ketones, (ii) introduction of various substituents into the alkyne functionality by Sonogashira cross-coupling, (iii) synthesis of pyrazole units by the reaction of *α,β*-alkynyl compounds with hydrazine monohydrate, (iv) gold-catalyzed cyclization of pyrazoles with terminal alkyne units afforded the *6-exo-dig* cyclization product. However, exclusive formation of *7-endo-dig* cyclization products was observed with internal alkynes, and (v) cyclization with NaH only resulted in the formation of *6-exo-dig* cyclization products. Furthermore, this methodology allows various substituents to be introduced into all positions of the target compounds [5,6].

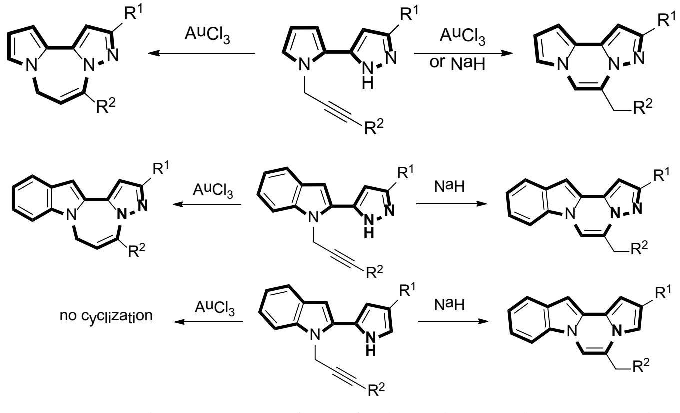

Figure 1: Synthetic strategy of *6-endo-dig* and *7-exo-dig* compounds.

Acknowledgements: Financial support from the Scientific and Technological Research Council of Turkey (TUBITAK, grant no. TBAG-112 T360), the Turkish Academy of Sciences (TUBA), and the Middle East Technical University (METU) is gratefully acknowledged.

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Keywords: Heterocycles, Ring closure reactions, Gold-catalyzed cyclization

S-C2-002

N-HETEROCYCLIC CARBENE (NHC) CATALYZED ARYLATION OF ALDEHYDES

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Diarylmethanols are important structural motives for the synthesis of biologically and pharmaceutically active compounds [1]. The addition of organometallic reagents to aryl aldehydes has been the general method to obtain the diarylmethanols. Organolithium, organomagnesium, organozinc and organocopper compounds are the most frequently used organometallics. However, limitations to their applications arise from the nature of the reagents, which are usually toxic and sensitive to air and moisture [2]. In recent years, 1,2-addition of boronic acids to aldehydes catalyzed by rhodium complexes, especially N-Heterocyclic carbene (NHC) complexes has become a very useful approach to prepare such compounds, because boronic acids have the advantageous features such as low toxicity, stability and easy handling (Figure 1) [3]. In this presentation, some of the recent examples to develop more active NHC ligands will be presented.

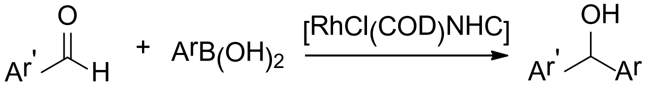

Figure 1: *Arylation of aromatic aldehydes.*

Acknowledgements: The funding of the Scientific and Technological Research Council of Turkey (TÜBİTAK) and Ege University is gratefully acknowledged.

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Keywords: N-heterosiklik karben, arilasyon, rodyum

S-C2-003

SYNTHESIS OF POLYDENTATE CARBENE PRECURSORS AND PROPERTIES

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Following the synthesis of the first stable carbene, *N*-heterocyclic carbene precursors and metal complexes of these ligands are formed an effective area on organometalic chemistry and catalysis. While mono and bidentate derivatives of *N*-heterocyclic carbene precursors are widespread in the literature and their complexes are used many reactions, polydentate carbenes creates considerably interest recently. Polydentate *N*-heterocyclic carbene precursors and transition metal complexes which synthesized from these precursors have high catalytic efficiency in many reactions such as small molecule activation, C-H activation, C-C coupling reactions, hydrosilylation and alkylation [1]. Because the effects of the chelation provides high thermal stability in complex, these ligands and transition metal complexes containing these ligands provide increase of potential in catalytic applications.

Most polycarbenes situate as pincer, three or four carbene ligands in the literature. Moreover, these ligands formed complex with metals such as Pd, Cu, Ag, Pt, Ru, Ni and Ir [2,3]. Synthesized these carbene ligands and transition metal complexes have shown high activity in many catalytic reactions such as hydrogen transfer, alkane oxidation, hydrosilation, C-C pairings and hydroformylation [3,4].

In this study some polydentate carbene precursors have been synthesized and tested for some catalytic reactions.

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Keywords: Catalytic reaction, N-heterocyclic carbene, polydentate carbene

S-C2-004

SYNTHESIS OF SOME FUNCTIONALIZED NEW BENZIMIDAZOLIUM SALTS AND INVESTIGATION OF THEIR MICROWAVE ASISTED CATALYTIC ACTIVITIES IN THE PRESENCE OF $Pd(OAc)_2$/BASE AND COPPER IN SONOGASHIRA COUPLING REACTION

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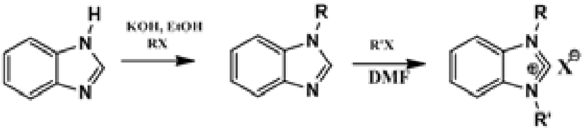
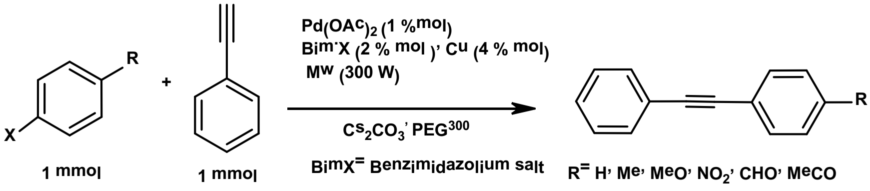
The Pd-Cu catalyzed cross-coupling reaction of terminal alkynes with aryl halides provides a useful method for the of construction conjugated acetylenic compounds, a privileged class of molecules that have found application in diverse areas ranging from natural products and pharmaceuticals to molecular organic materials in nanomaterials [1-3]. The search for catalysts will continue to be one of the highest priorities for both laboratory and chemical industry as it seeks to run the processes at as low a temperature and as near atmospheric pressure as possible, commensurate with a reasonable rate of reaction with minimum waste and high product yield.

In order to find an effective catalyst system in Sonogashira cross coupling reaction in the scope of this frame, a series of new benzimidazolium salts seen in Scheme 1 were synthesized and their catalytic activities were determined in the presence of catalyst system containing $Pd(OAc)_2$, CuNPs, and base as summarized in Scheme 2.



No	R	R'	X
1	$CH_2C_6H_5$	$CH_2COC_6H_5$	Br
2	$CH_2COC_6H_5$	$CH_2COC_6H_5$	Br
3	$CH_2CH_2C_6H_5$	$CH_2COC_6H_5$	Br
4	$CH_2COC_6H_5$	$(CH_3)_2CH$	I
5	CH_2CN	CH_2CN	Br
6	$CH_2COC_6H_5$	CH_3	I
7	$CH_2COC_6H_5$	CH_2CH_3	I
8	$CH_2COC_6H_5$	$CH_2(CH_2)_2C_6H_5$	Br
9	$CH_2COC_6H_5$	CH_2CN	Br
10	$CH_2C_6H_5$	$CH_2(CH_2)_2CN$	Cl

Scheme 1. Synthetic pathways of the benzimidazolium salts (**1**-**10**).



Scheme 2. The optimized reaction conditions for the Sonogashira cross coupling reactions.

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Keywords: Sonogashira reactions, alkyne synthesis, benzimidazoles, microwave

S-C2-005

RESEARCH OF THE ESTERIFICATION REACTION OF ANHYDRIDES OF ALKENYLSUCCINIC ACIDS IN THE PRESENCE OF VARIOUS CATALYSTS

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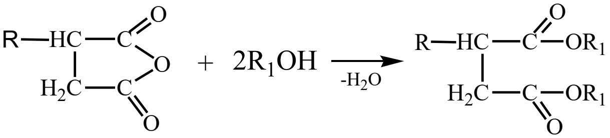
Esters of carboxylic acids found wide application in various industries as lubricants, additives for lubricating oils and fuels, solvents, components of various aromatic essences, food additives, perfumery compositions, reagents for treating textiles and paper [1].

It is known that the most basic and simple method of producing esters is currently the esterification of carboxylic acids in the presence of acid-type catalysts (for example, p-toluenesulfonic acid (PTSA), sulfuric acid, etc.).

We synthesized the esters of vicinal dicarboxylic acids, in particular esters of alkenylsuccinic acid with alcohols of various structures [2]. As the catalyst of an esterification used acidic catalysts (PTSA and Tseokar-2, TiO_2, KU-2, N-methyl pyrollidone hydrosulphate, 1,4-dimethylpipeazine dihydrosulphate).



The efficiency of the catalyst was evaluated by the yield of the ester. The amount of catalyst ranged from 0.5-1.5% on the reaction mixture. The molar ratio of alcohol to anhydride in the preparation of esters was 1: 2-3.Esterification of anhydride with low-molecular alcohols (C_2-C_6) was carried out in the presence of azeotropic solvents, such as benzene, toluene, p-xylene at the boiling temperature of these solvents. Completion of the reaction was determined by quantity of allocated reaction water, also by value of acid number of an esterificate. The duration of the esterification reaction was typically 6-8 h. In reaction course an important role is played by chemical structure of alcohol.

For studying the influence of alcohol structure on course of esterification reaction it was investigated reaction of an esterification of anhydride AAA with alcohols of aliphatic, cyclic and aromatic series. Esterification by cyclic alcohols (cyclohexanol, methyl-cyclohexanol, benzyl alcohol) proceeds more difficulty [3], which prolongs the reaction time. The yield of cyclic ethers is less than the yield of esters with aliphatic alcohol.

Acknowledgements :This work was supported by the Science Development Foundation under the President of the Republic of Azerbaijan - **Grant №EIF-2014-9(24)-KETPL-14/05/4**

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Keywords: alkenylsuccinic acid, esterification reaction, acid-type catalysts

S-C2-006

SELECTIVE GAS PHASE OXIDATION OF MONOCHLOROTOLUENES OVER MODIFIED OXOVANADIUM SYSTEMS SUPPORTED ON Al_2O_3 AND SiO_2

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Modified oxovanadium systems supported on Al_2O_3 and SiO_2 were prepared by the impregnation techniques and characterized by IRS, Thermal analysis, N_2 adsorption/desorption and X-ray powder diffraction (XRD) to determine the phase structure, loadings of vanadium species, catalyst surface and porous radius. These materials were tested for solvent-free catalytic oxidation of monochlorotoluene (mono-CT) under identical condition. The effect of reaction time, V/P and V/Mo molar ratio, reaction temperature and mono-CT/O_2 molar ratio on the catalyst performance were examined in order to optimize the conversion of mono-CT and yields selectivity. The result shows that V-P-O/SiO_2 and V-Mo-O/Al_2O_3 are effective catalysts, exhibiting 84.3% conversion of p-chlorotoluene, 32.4% to monochloromaleic anhydride (MCMA) selectivity and 76.7% conversion of m-chlorotoluene, 21.8% to MCMA selectivity, representatively. Consequently, the *p*-chloro-substituted substrate, p-chlorotoluene, is much more reactive than the *m*-chloro-substituted counterpart. Furthermore, the catalyst can be easily recovered and reused for 20-25 hours without a significant loss in its activity and selectivity.

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Keywords: catalytic oxidation, chloromaleic anhydride, 4-chlorotoluene; oxovanadium, maleic anhydride, 2-chlorotoluene,

S-C2-007

STEREODIVERGENT ASYMMETRIC CATALYSIS WITH A MECHANICALLY POINT-CHIRAL ROTAXANE

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Controlling the activity and selectivity of the catalysts has been popular recently because of the potential of absolute control over the reaction rates, selectivity or type [1, 2, 3]. We describe Cu(II)-dependent stereodivergent asymmetric Michael addition reaction with mechanically point-chiral [2]rotaxane. Mechanical point-chirality of the rotaxane was created in the neighbouring carbon of an amine organocatalyst, by confinement of the macrocycle on one of side of the achiral thread. Handedness of Michael addition product is reversed from R (21:79, S:R) to S (62:38, S:R) as Cu (II) is chealated by the amine organocatalyt on the thread, switch aminocatalysis off and metal catalysed reaction dominates through selective exposure of si face of the conjugated substrate. In this work, we demonstrate that mechanically point-chiral rotaxane catalyst can be optimised to have better selectivity (up to 21:79 in this study), can be generalised to metal catalysis and stereodivergence can be achieved through switching between metal and organocatalyst modes using a single enantiomer of the catalyst.

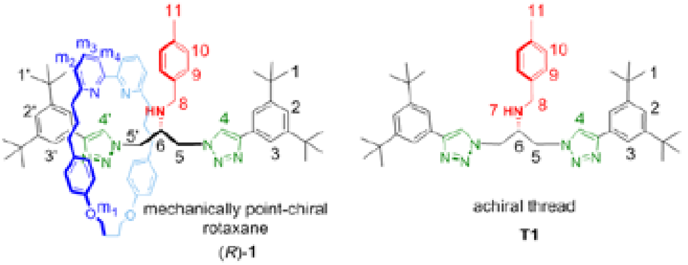

Figure 1: Chemical structures of catalysts (R)-1 and thread T1. Mechanical point-chirality is generated on carbon C6 on the axle of the rotaxane by confinement of the macrocycle selectively at one side of the achiral thread.

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Keywords: rotaxane, asymmetric catalysis, supramolecular chemistry

S-C2-008

ENANTIOSELECTIVE HYDROLYSES OF RACEMIC IBUPROFEN METHYL ESTERS BY IMMOBILIZED LIPASE

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Ibuprofen is a non-steroid anti-inflammatory drug, the first found in derivatives of phenyl propionic acid which shows analgesic, antipyretic, and anti-inflammatory activities. Ibuprofen prevents synthesis of prostaglandin from arachidonic acid by inhibiting cyclooxygenase enzyme reversibly. Thereby, the role of prostaglandins in inflammatory reactions is brought under control. Its most common side effect is seen in gastrointestinal system [1].

This study is consisted of three steps. Magnetic Fe_3O_4 nanoparticles were prepared in the first step [2]. Racemic epichlorohydrin was used as a spacer arm to nanoparticles to immobilize the enzyme [3]. SEM, XRD, TGA and FT-IR were used to characterize the structures of prepared magnetic nanoparticles and modified magnetic nanoparticles. In the second step, Lipase (Candida Rugosa Lipase) enzyme was immobilized to modified nanoparticles by covalent binding method. Then, the enzymatic activities, optimum pH's, optimum temperatures, thermal stabilities, and storage stabilities of free and immobilized lipase were defined. The reusability of immobilized lipase was also determined [4].

In the last step, enantioselective hydrolyses processes of racemic methyl esters of ibuprofen were performed by using immobilized lipase (Figure1) [5]. By calculations of yields as a result of hydrolyses reaction % ees, % eep, % c, and E values are obtained as 75.19, 77.30, 49, and 17, respectively when 600 mg immobilized lipase is used. This study was supported by TUBITAK (113Z773) and Dicle University (14-ZEF-16).

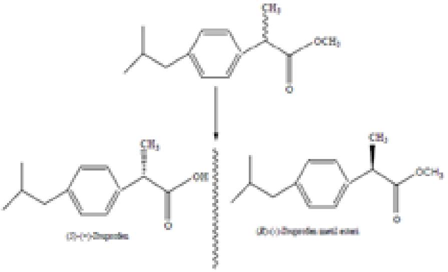

Figure1: Enantioselective hydrolyses processes of racemic methyl esters of ibuprofen

Acknowledgements: This study was supported by TUBITAK (113Z773) and Dicle University (14-ZEF-16).

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Keywords: Magnetic Fe3O4 nanoparticles, immobilized lipase, ibuprofen, enantioselective hydrolysis

S-C2-009

LIGAND CONTROLLED NICKEL CATALYZED ALLYL COUPLING OF MIXED ARYLZINC REAGENTS

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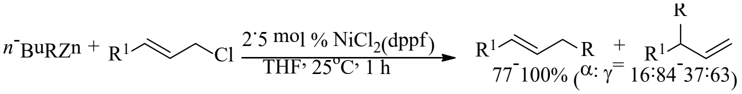
Transition metal catalyzed coupling of organozinc reagents with carbon electrophiles are among the most valuable methodologies in organic synthesis [1-3]. Diorganozincs, R_2Zn are more reactive than monoorganozincs, RZnX. However, the use of R_2Zn reagents are not atom-economic, since only one of the R groups can be transferred to the electrophile. The problem has been solved by developing mixed diorganozincs, R^1R^2Zn type, in which one of the R groups has a lower transfer rate than the other [4,5]. We showed that the group selectivity of (alkyl)(aryl)zinc reagents can be controlled by changing reaction parameters, i.e. the solvent and the temperature as well as the transition metal catalyst and the organocatalyst [6,7]. The group selectivity and regioselectivity in the allylation of mixed (n-butyl)(aryl) zinc reagents in THF depends on the nickel catalyst type and also on nature of the allylic substrate. Allylation of (n-butyl)(phenyl)zinc reagent with alkyl substituted primary allylic chlorides and acetates in the presence of $NiCl_2$(dppf) catalysis affords the phenyl coupling product with g-selectivity. However, allylation with aryl substituted primary allylic substrates results in both phenyl- and alkyl- coupling products with medium a-selectivity in the presence of $NiCl_2$(dppf) catalysis whereas phenyl coupling product is formed with a-selectivity in the presence of $NiCl_2(Ph_3P)_2$ catalysis. This new $NiCl_2$(dppf) catalyzed protocol for g-selective aryl allylation of (n-butyl)(aryl)zinc reagents with alkyl substituted primary allylic chlorides in THF at room temperature provides an atom economic alternative to allylation of $(aryl)_2Zn$ reagents. A mechanism for the dependence of group selectivity and regioselectivity of Ni catalyzed allylation of (n-butyl)(aryl)zinc reagents on the catalyst ligand and the substrate was proposed.



R= C_6H_5, FG-C_6H_4(FG= 3-Me, 4-Me, 4-t-Bu, 3-MeO, 4-MeO, C_6H_5)
R^1=Me, n-Pr

Acknowledgements: We thank Turkish Scientific and Technical Research Council (Grant No. TBAG 112T886) for the financial support.

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Keywords: (Alkyl)(aryl)zincs, mixed diorganozincs, allylation, Ni catalyst, regioselectivity, group selectivity

S-C3-001

CATALYST EFFECT OF CHITOSAN ON BIODIESEL PRODUCTION

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Biodiesel is an renewable and alternative fuel. Chitosan which is a biopolymer is used as a catalyst for biodiesel production. This work is discuss the "Catalyst Effect of Chitosan on Biodiesel Production"..

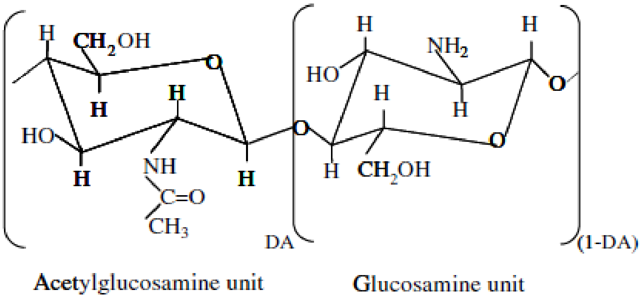

Fig. 1. Structure of chitosan (DA: degree of acetylation)

Novadays using chitosan as catalysts for (trans)esterification reactions of different oils with methanol is an interesting research point. In that works researchers investigate the chitosan-cryogels [1], calcined calcium/chitosan spheres [2], Guanidinylated chitosan (GCS)[3].

Also, this article is argued about the modification chitosan using as a catalyst in biodiesel production

Acknowledgements: This work was supported by Kırklareli University Scientific Research Projects Coordination [Project No: KLÜBAP / 088].

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Keywords: Biodiesel, Biofuel, Catalyst, Chitosan

S-C4-001

TRANSFER HYDROGENATION OF AROMATIC NITRO, NITRILE AND CARBONYL COMPOUNDS CATALYZED BY REDUCED GRAPHENE OXIDE SUPPORTED COBALT-PALLADIUM ALLOY NANOPARTICLES

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The reduction of unsaturated groups is one of the indispensable tools in organic chemistry for the synthesis of wide array of new and valuable organic compounds [1]. Although various reduction methods have been developed so far, the hydrogenation by H_2 gas is still widely-used one both in industry and research laboratories. This type of reduction reactions is generally performed in the presence of a nobel metal catalyst under high H_2(g) pressure at high temperature in organic solvents [2]. Therefore, a great effort has been dedicated to develop a more facile and generalized route for the hydrogenation of unsaturated organic groups. The transfer hydrogenation is considered to be one of the most promising and green alternative. Up to date, a variety of molecules such as isopropanol and hydrazine have been tested as hydrogen donor in the transfer hydrogenation of unsaturated organic compounds, but they were slow and provided low selectivity. Recently, we have developed a very promising yet efficient transfer hydrogenation route using ammonia borane (AB, $NH_3{\cdot}BH_3$) as a hydrogen source and reduced graphene oxide supported $Ni_{30}Pd_{70}$ alloy nanoparticles (rGO-$Ni_{30}Pd_{70}$) as catalysts [3]. In our one-pot methodology, rGO-$Ni_{30}Pd_{70}$ catalyzes AB dehydrogenation and then in-situ transfer the H_2(g) to the unsaturated group in aqueous methanol solution in a thermolysis tube at room temperature.

In this study, we report the application of our new transfer hydrogenation methodology over aromatic nitro, nitrile, and carbonyl compounds to the corresponding primary amines and alcohols, respectively, in the presence of rGO-CoPd catalysts under ambient conditions. Our reduction approach comprises the tandem AB dehydrogenation and hydrogenation of unsaturated organic groups catalyzed by reduced graphene oxide supported $Co_{30}Pd_{70}$ alloy nanoparticles (rGO-$Co_{30}Pd_{70}$) in water/methanol mixture (v/v = 7/3) at room temperature. Monodisperse $Co_{30}Pd_{70}$ alloy NPs were synthesized by using an organic solution phase protocol involving the co-reduction of cobalt(II) acetylacetonate and palladium(II) acetylacetonate in oleylamine and borane-*tert*-butylamine mixture at 100 °C. The colloidal $Co_{30}Pd_{70}$ NPs were assembled on reduced graphene oxide (rGO-$Co_{30}Pd_{70}$) before their use as catalysts in the tandem reactions. A variety of aromatic nitro, nitriles, and carbonyl compounds were tested by the rGO-$Co_{30}Pd_{70}$ catalyzed tandem reaction and all the corresponding primary amines or alcohols were obtained by the yields reaching up to 99% within reaction times of 5–15 min.

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Keywords: Co, Pd, alloy nanoparticles, transfer hydrogenation

S-C4-002

ASYMMETRIC CATALYSIS WITH A MECHANICALLY POINT CHIRAL ROTAXANE

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Distinctive features imparted by the mechanical bonding in rotaxanes (such as their dynamic properties and the ability of the ring to mask regions of the thread) are beginning to be investigated in various aspects of catalysis [1, 2, 3, 4]. We have used mechanical point-chirality in a [2]rotaxane for asymmetric catalysis [5]. Stable enantiomers of the rotaxane result from a bulky group in the middle of the thread preventing a benzylic amide macrocycle shuttling between different sides of a prochiral center, creating point chirality in the vicinity of a secondary amine group. The resulting mechanochirogenesis delivers enantioselective organocatalysis via both enamine (up to 71:29 er) and iminium (up to 68:32 er) activation modes. Desymmetrization of the thread by the presence of the macrocycle (blue) creates a chiral center on the carbon center labelled as C_{11} close to an amine moiety shown in red in Figure 1. This chiral supramolecular environment created around the amine enables successful asymmetric transformation of different a,b-unsaturated aldehydes through iminium activation and a-amination of various aldehydes by means of enamine activation at -20°C in dichloromethane. When parent thread is used as catalyst, which lacks desymmetrization by the macrocycle, no enantiomeric bias was observed. With this work, for the first time, we have demonstrated that mechanochirogenesis can be an alternative design strategy for asymmetric synthesis.

entry[a]	**cat.**	**Product**	**conv. (%)**	***er* (*S*:*R*)**
1	thread	1	63	50:50
2	rotaxane	1	50	68:32
3	thread	2	>95	50:50
4	rotaxane	2	>95	70:30

Figure 1: Chemical structure of mechanically point-chiral catalyst in which a macrocycle (blue) creates an asymmetric environment around a benzyl amine organocatalyst (red). With this catalyst, successful asymmetric conversions via both iminium and enamine activation modes (products **1**, **2**) has been achieved.

Acknowledgements: Sundus Erbas Cakmak and Yusuf Cakmak thank to Marie Curie Intra-European Postdoctoral Fellowship and University of Manchester for financial support.

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Keywords: mechanical chirality, asymmetric catalysis, rotaxane catalyst, mechanochirogenesis

S-C4-003

PREPARATION OF TiO_2/PERLITE COMPOSITES BY USING 2^{3-1} FRACTIONAL FACTORIAL DESIGN

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TiO_2 is considered the most suitable photocatalyst due to its higher degradation capacity against to numerous organic pollutants. Hovewer, TiO_2 nanoparticles are required very expensive microfiltration processes for separating them from water after their usage in water treatment. This problem can be solved by attaching nanoparticles onto a support material [1]. However, photocatalytic efficiency of TiO_2 can decrease by immobilizing it on a support material due to the different reasons like properties of support material and production conditions. Optimum production conditions should be determined.

Perlite was used as TiO_2 support material due to its high silicon content and porous structure. Successive impregnation and calcination methods was applied in order to produce TiO_2/perlite composites with a modification of the procedure given in ref. [2]. Degradation capacity of TiO_2/perlite composites were investigated in methylene blue degradation process, as model. Effect of process parameters (TiO_2/perlite ratio, particle size of perlite and calcination temperature) on TiO_2 loading (%) and degradation capacity were investigated by using 2^{3-1} fractional factorial design method and response surface graphics. Both TiO_2 loading (%) and degradation efficiency of TiO_2/perlite were modeled. Developed models were statistically analyzed by using ANOVA tables. According to the regression, error analysis and chi square test, developed models confirmed experimental data well. According to developed models the most effective factors were determined and optimization of process parameters was done by using Design Expert Program Software. As a result, particle size and Ti/Perlite ratio were found as the most effective parameters on both TiO_2 loading (%) and degradation efficiency. TiO_2/perlite photocatalysts were characterized by X-Ray Diffraction Spectrometer, FTIR and SEM. XRD patterns indicated that anatase is the main crystalline phase.

Acknowledgements: This study was supported by the Research Fund of Yıldız Technical University Scientific

Research Projects Coordinating Department with the project number of 2013-07-01-GEP06.

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Keywords: Photocatalyst, TiO_2, perlite, experimental design, 2^{3-1} factorial design.

S-C5-001

USE OF THE ANALOG SERIES A QUATERNARY AMMONIUM SALT FOR SURFACE MODIFICATION OF MONTMORILLONITE

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In this study, the adsorption behavior of the analog series a quaternary ammonium salt which one of them has a branched structure (tetrabuthyl ammonium bromide $(C_4)_4$ABr) and others with five different hydrocarbon chain lengths, i.e. C_{16}TABr, C_{14}TABr, C_{12}TABr, C_{10}TABr, and C_8TABr, onto montmorillonite has been investigated. They were characterized by spectroscopic techniques such as XRD and FT-IR. Their surface morphologies were determined by using the SEM images. To reveal the adsorption mechanism the measurement of contact angles and zeta potential of the samples measured. When the alkyl chain length increased, the adsorption ability of the surfactant onto MMT surface increased[1]. The temperature on the adsorption process, the initial concentration of the surfactant and the effect of the contact time were studied. The adsorption isotherms were carried out and found to connect well with the Langmuir, Freundlich and Temkin. Adsorption model well fitted at all of temperatures, but this fitting reduced with decreasing of chain length. The isosteric enthalpy and entropy changes were evaluated. The adsorption of surfactants onto MMT was exothermic and spontaneous at all studied temperatures except for (C4)4ABr adsorption. The interlayer distance of the montmorillonite and the packing density of surfactant ions in the interlayer increased with increasing of chain length, as confirmed by XRD pattern. FTIR spectrum and contact angle measurements of pristine montmorillonite and organoclays indicated that the incorporation of surfactants and the changing of hydrophility were in the different organo clays. The values of zeta potential indicated the presence of hydrophobic interaction between the tail groups for C_{16}TABr and partly C_{14}TABr adsorption. According to the raw clay, the negative values of zeta potential of other surfactants (C_{14}TABr, C_{12}TABr, C_{10}TABr, C_8TABr and $(C_4)_4$TABr) apart from C_{16}TABr showed that ion exchange was more dominant than electrostatic interactions in the adsorption process.

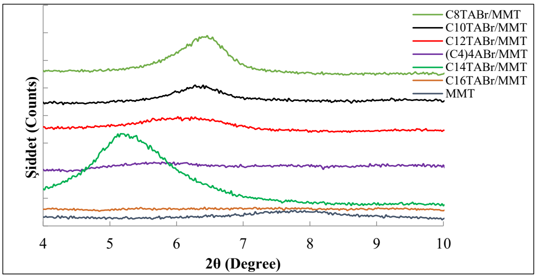

*Fig.1***.** XRD patterns of the pristine montmorillonite and surfactant modified montmorillonite samples.

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Keywords: Quaternary Ammonium Salt, Montmorillonite, Adsorption, Zeta potential

S-C5-002

SURFACE CHARACTERIZATION OF BIOCHARS PRODUCED BY HYDROTHERMAL CARBONIZATION AND APPLICATION FOR ANIONIC AND CATIONIC DYE ADSORPTION

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Cleaning wastewater is one of the most important environmental problems for humanity. The adsorption techniques have long been used in scientific circles to remove organic pollutant from wastewater because of its easy handling, high efficiency, economic feasibility and simplicity in design. The various biochar appears to be a new potential low-cost and effective adsorbent and has been used frequently as adsorbent [1]. One of the appropriate methods to obtain the biochar with improved adsorption characteristics is the hydrothermal carbonization. The chemistry of carbonization, morphology and particle size can be controlled by hydrothermal carbonization [2].

In this study, glucose, cellulose and hazelnut shells were hydrothermally carbonized under mild conditions in order to obtain biochar as a biomass derived adsorbents. The surface-functionalization agents and the various salts as auxiliaries were used to obtain the improved adsorption characteristics of biochars in this work. The surfaces of the biochars were functionalized using different acids, bases and neutral salts and characterized with Boehm titration, Fourier transform infrared spectroscopy and X-ray photoelectron spectroscopy techniques. Methylene blue and methyl orange were used to determine the adsorption capacity. Three auxiliaries KCl, CTAB and $NaHCO_3$ were used for testing the ionic strength of salts on the adsorption process. Treatment with different agents leads to an increase in the number of oxygen-containing functional groups on the surface thus increasing the adsorption capacity. Using auxiliaries significantly affected the pH of the solution, structure of dye and the electrostatic interaction between dyes and biochars.

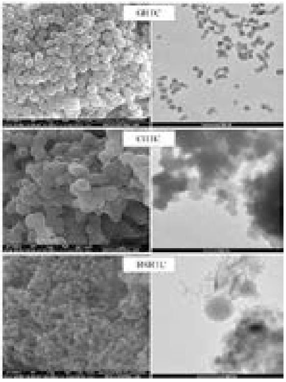

Figure 1: SEM and TEM images for biochars

Acknowledgements: The authors are grateful to the Scientific and Technological Research Council of Turkey-TUBİTAK for their generous financial support (KBAG-113Z635).

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Keywords: Hydrothermal carbonization, adsorption of dyes, surface functionalization, kinetic study

S-D1-001

SIMPLE, RAPID AND COST-EFFECTIVE PRECONCENTRATION OF ACRYLAMIDE FROM CHIPS, CRACKERS AND CEREAL-BASED BABY FOODS PRIOR TO ITS SPECTROPHOTOMETRIC DETECTION

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The Acrylamide (AA) is a Maillard reaction product, which forms spontaneously as frying or cooking heat treatment enforced in foods [1]. Though the mentioned chemical is widely found in the fried or oven-cooked foods, it can also exist in the grilled foods prepared at homes or at large restaurants [2]. The AA can be especially formed in high temperatures heating of carbohydrate-rich foods. According to the research, neural destructions was observed in people exposed to this chemical [3]. The AA is also estimated to be a human carcinogen. Thus, the AA have been accepted as “probably carcinogenic to humans” (Group 2A) by International Agency for Research on Cancer [4]. Thus, the determination of trace the AA residues in foods needs the development of new, more efficient, cost-effective, faster, and powerful analytical methods in terms of control the quality attributes.

In the current research, a simple ultrasonic assisted extraction procedure was recommended and combined with spectrophotometry for the determination of the AA in processed food samples. Under ultrasonic power, the extraction process is based on the charge transfer complexation of prop-2-enamide (acrylamide) with Sn(IV) ions in presence of phenyl safranin and potassium fluoride (KF) at pH 5.0, and then extraction of ion-associate complex into the micellar phase of nonionic surfactant, (1,1,3,3-Tetramethylbutyl)phenyl-polyethylene glycol (Triton X-114). All factors affecting the complex formation and extraction conditions were extensively evaluated and optimized. This procedure were carried out with the optimum conditions: pH 5.0; frequency 40 kHz; temperature 45 °C; ultrasonic time 20 min; complexing concentration, phenyl safranin, 15 μmol L^{-1}; KF concentration 50 μmol L^{-1}; sample volume 10 mL; Triton x-114 concentration 0.23 mmol L^{-1}; solvent type and volume, methanol and 0.5 mL. Under optimum conditions, the analytical parameters of the proposed procedure was found as follows; linear working range, 10-180 μg L^{-1}; the limit of detection (LOD), 6.7 μg L^{-1}; sensitivity enhancement factor, 90; and relative standard deviation (RSD %), 2.2 %. The proposed procedure was validated by intra- and inter-day precision studies using standard addition method, was obtained with the recoveries in the range of 95.2–103.6 %. As the last, the proposed method was successfully applied to the determination of acrylamide in processed food samples such as chips, crackers and cereal-based baby.

Keywords: Acrylamide, Baby Foods, , Food Safety, Preconcentration, Spectrophotometry

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Keywords: Acrylamide, Baby Foods, Food Safety, Preconcentration, Spectrophotometry

S-D1-002

A SIMPLE DISPERSIVE LIQUID–LIQUID MICROEXTRACTION METHOD FOR DETERMINATION OF BISMUTH BY FAAS

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Metal containing compounds have been used in medicine and health applications for a long time [1–4]. Bismuth is in the same group of the periodic table as nitrogen, phosphorus, arsenic and antimony. The elements in this group are directly or indirectly concerned with the maintenance of human health as either essential elements or therapeutic/toxic elements. Conversely to other heavy metals, it is almost non-toxic, eventhough bismuth toxicity has been reported due to careless use. Bismuth together with antibiotics (triple therapy) was suggested as a standard treament for peptic ulcer and *Helicobacter pylori* infection, and it also has potential for the treatment of other diseases [2]. Furthermore, bismuth complexes have also been shown to exhibit promising antitumor activities [5].

In this study, a simple and efficient dispersive liquid–liquid microextraction (DLLME) procedure was optimized for the determination of bismuth by flame atomic absorption spectrometry (FAAS). In this study, crystal violet was used as counter positive ion for $BiCl^{4-}$ complex ion, chloroform as extraction solvent, and ethanol as disperser solvent.The effective parameters on the recovery of bismuth, such as the acidity of sample, the type and volume of extraction and disperser solvents, the amount of crystal violet reagent, extraction time and interfering ions of sample solution were investigated. The calibration graph of DLLME procedure was linear in the range of 0.04 – 1.00 mg $L^{'\,1}$ with detection limit of 4.0 µg $L^{'\,1}$ (n = 13). The relative standard deviation (RSD) was 3% (n=11, 0.20 mg $L^{'\,1}$) and the preconcentration factor was 74. Good recovery (%) values were obtained changing between 95 and 101%. The certified reference material (TMDA′ 64 lake water) was used to verify the accuracy of the developed method. The proposed DLLME method was applied for determination of bismuth in various water, pharmaceutical and cosmetic samples.

Acknowledgements: Atomic absorption, Bismuth, Crystal violet ligand, Dispersive liquid-liquid microextraction

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Keywords: Atomic absorption, Bismuth, Crystal violet ligand, Dispersive liquid-liquid microextraction

S-D1-003

PREPARATION AND CERTIFICATION OF NATURAL GAS MIXTURES

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Natural gas plays a key role in ensuring we are able to meet our energy needs in the future. It is one of the most important forms of energy because it is clean, abundant, reliable and versatile. Natural gas is the cleanest-burning fossil fuel, with 30 percent less carbon than oil and as much as 60 % less carbon than coal reducing emissions and enhances air quality. Heating value is maybe the most important property to be measured/calculated in terms of gas quality. In order to accomplish that, measurement of the gas components by an instrumental technique plays a vital role.

First purpose of this study is to prepare natural gas synthetically at 5 different concentrations and then to develop measurement method with high accuracy and precision. The calibration gas mixtures are prepared gravimetrically according to ISO 6142 [1] with very low uncertainty (expected max U=0.2%, *k=2*). The certification process will include determination of C_1-C_6, H_2, He, N_2, CO_2 gases concentration by gas chromatography equipped with FID and 2 TCD detectors. Method development will seek to shorten analysis time as well as robustness. Once the method is set and reference gas mixtures are prepared they will be certified to function as the top of the traceability chain. These primary reference gases will be verified at UME according to ISO 6143 [2]. Their stability will be confirmed.

The second purpose of the study is to take part in international comparison (CCQM-K118) which is organized by CCQM Gas Analysis Working Group [3]. In this key comparison, two gas mixtures will be provided by the organizer to each participant. The analyses of these gas mixtures will be carried out using reference gas mixtures prepared at TÜBİTAK UME Gas Metrology laboratories.

References:

[1] ISO 6142-1:2015, Preparation of calibration gas mixtures - Part 1: Gravimetric method for Class I mixtures
[2] ISO 6143-2001, Gas analysis - Comparison methods for determining and checking the composition of calibration gas mixtures
[3] Bureau International des Poids et Mesures (BIPM), Consultative Committee for Amount of Substance; Metrology in Chemistry and Biology (CCQM), Gas Analysis Working Group (GAWG).

Keywords: Natural gas, metrology, uncertainty, gas chromatography, gravimetric preparation

S-D1-004

VALIDATION OF AN IDMS METHOD FOR THE DETERMINATION OF ELEMENTS IN SOIL BY SECTOR FIELD ICPMS

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Soil is a complex material that consists of organic and inorganic substances at varying ratios depending on its origin. The elemental concentrations may be affected by anthropogenic activities. Due mainly to the industrial emissions, toxic elements may accumulate on soil and enter into the food chain. The determination of elements in soil is needed in order to assess the environmental pollution and the resulting health effects. Soil analysis is also needed for agricultural concerns in order to monitor the level of essential elements for plant growth. In both cases, obtaining accurate and reliable measurements results is very important in order for remedial actions. In chemical analysis, certified reference materials play important role for development, validation and quality control purposes. Since the matrix shows large variations on earth crust, different soil reference materials are needed. In this study, the method is developed for the determination of As, Mn, Fe, Pb and Cd in contaminated and non-contaminated soil samples. The samples were digested in MW digestion system at 210 °C for 40 minutes using 8 mL of 65% (w/w) HNO_3, 5 mL of 36% (w/w) HCl and 2 mL of 40% (w/w) HF. During the measurements by SFICPMS, 3 calibration strategies were applied:

i) Matrix matched standard addition for As (HR) and Mn (LR-MR),

ii) Direct IDMS for Cd (LR) and Fe (MR)

iii) Reverse IDMS for Pb (LR)

The isotopic interferences of Zr and Mo on Cd signals were also monitored and corrected. The concentrations found in contaminated and non-contaminated soil samples, are given, respectively, in µg/kg as follows (on dry mass basis): As (79.7 ± 2.7 and 14.40 ± 0.44), Cd (442 ± 6 and 0.550 ± 0.008), Mn (1172 ± 38), Fe (20.6 ± 0.2 and 33.2 ± 0.3), Pb (235 ± 8 and 41.3 ± 1.4). The calculation of measurement uncertainty using bottom-up approach showed that the major sources of uncertainty for all elements are measurement repeatability and the signal RSDs. For ID measurements, IUPAC abundances were also found to be a significant source of uncertainty. The uncertainties on the isotope ratio values of Pb is also another major source of uncertainty on Pb result. The reported measurement results for all elements were found to be in good agreement with the KCRV of CCQM-K127. The results showed TÜBİTAK UME's measurement capability on the determination of elements in soil and the support CMCs for the recognition of certificates produced by TÜBİTAK UME.

Keywords: Soil, Isotope Dilution, ICPMS, Toxic Elements

S-D1-005

METHOD DEVELOPMENT FOR VOC ANALYSIS WITH TD-GC-MS: A COMPARISON OF COLUMNS AND ADSORBENT TUBES

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Volatile organic compounds are persistent small organic molecules with adverse effects. Some VOCs are dangerous to human health whilst others cause harm to the environment by influencing the oxidative capacity of the atmosphere, contributing to the production of other air pollutants as well as to greenhouse gases and ozone, and by also being involved in the formation of secondary organic aerosols. In this study the VOC key compounds, listed in the table below that are regulated by European legislation were investigated.

Measuring VOCs is complex because of their variety, their different physical and chemical properties and their presence in the atmosphere at very low concentration levels ((sub)-part-per-billions). In this study a TD-GC-MS method was developed and presented. In the development of the method, five different GC columns and 10 different absorbent types were investigated. The reported method is valid for both polar and semipolar VOCs.

This study is a part of Joint research Project (JRP) conducted by the participation of ten national metrology institutes one of which is TUBITAK UME, where the ultimate goal of the JRP is to produce a reference material and a reference method for standardizing the VOC measurements in the world.

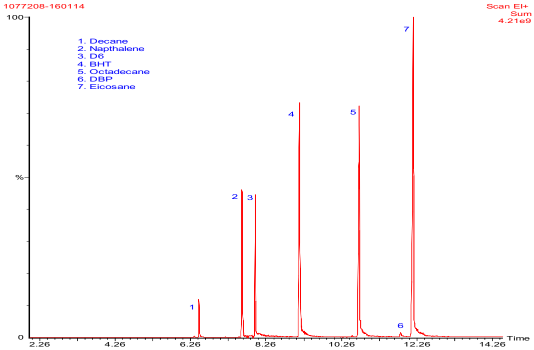

Figure 1. A chromatogram of SVOCs using Tenax TA - Carbograph 5TD with ZB5MS column 1-Decane (RT 6.5), 2-Naphthalene (RT 7.6), 3-D6 (RT 7.9), 4-BHT (RT 9.1), 5-Octadecane (RT 10.7), 6-DBP (RT 11.9), 7-Eicosane (RT 12.2)

This study is a part of Joint Research Project which is jointly funded by the EMRP participating countries within EURAMET and the European Union.

References: https://www.euramet.org/Media/docs/EMRP/JRP/JRP_Summaries_2013/Environment_JRPs/ENV56_Publishable_JRP_Summary.pdfDoe, J. A.; Smith, J. D. *Journal* year, *volume*, pages. Last reached on 15.06.2016

Keywords: Volatile Organic Compounds, TD-GC-MS, reference material production.

S-D1-006

PRECONCENTRATION OF TETRACYCLINE RESIDUES FROM SOME KIND OF FOOD MATRICES USING IONIC LIQUID BASED ULTRASONIC ASSISTED AQUEOUS TWO PHASE EXTRACTION

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Tetracyclines have been widely used as veterinary drugs and feed additives in livestock husbandry depending on to their broad spectrum properties [1]. Their residues may cause directly toxic or allergic reactions for hypersensitive individuals via accumulation in liver organisms [2]. The qualitative and quantitative analysis of tetracycline residues in food samples have been in great importance because of their toxic effects at lower concentrations. For this, several monitoring and separating methods have been published in literature [3].

In this study, a novel rapid ionic liquid based ultrasonic assisted aqueous two-phase extraction was applied to food samples before determination of tetracycline compounds (oxytetracycline, tetracycline, chlortetracycline, minocycline, metacycline and doxycycline) by HPLC with gradient elution using trifluoroacetic acid-acetonitrile and absorbance detection at 270 nm.

The procedure was succeeded of different ionic liquids containing various of anionic and cationic groups named as1-butyl-3-methylimidazolium bromide (BMIMBr), 1-butyl-3-methylimidazolium tetrafluoroborate (BMIMBF4), 1-allyl-3-methylimidazolium bromide (AMIMBr), 1-allyl-3-methylimidazolium tetrafluoroborate ($BMIMBF_4$), 1-benzyl-3-methylimidazolium bromide (BeMIMBr) and 1-benyl-3-methylimidazolium tetrafluoroborate ($BeMIMBF_4$). The extraction factors were optimised as pH of the solution, effect of surfactant type and its amount, amount of ionic liquids, addition of salt, extraction time and sonication. The maximum extraction efficiencies of each tetracyclines were examined with differenciaton of ionic liquids in aqueous test solutions. This method was used because of its low-cost and recyclable prosess and also having higher partitioning feature addition to its environmentally friendly feature.

Acknowledgements: The authors are grateful for the financial support provided by The Scientific and Technological Research Council of Turkey; Peoject Number: 115Z083.

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Keywords: Tetracycline, aqueous two-phase extraction, HPLC

S-D1-007

DETERMINATION OF NICOTINE, PROPYLENE GLYCOL AND GLYCERIN IN E-LIQUIDS BY USING CHROMATOGRAPHIC METHODS

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E-cigarettes (e-cigs) in the current form were released in 2003 [1]. Sales of e-cigs were started in 2007 in our country. Then sales of e-cigs and e-liquids (e-liqs) have been made subject to license in 2008. However, exports of e-cigs and e-liqs from other countries continue to rise despite of legal challenges regarding their regulatory status. Sales of e-cigs and e-liqs continue uncontrollably over the internet. Cartridges located in the e-cigs are filled with e-liqs. Variety of e-liqs was increased with the increase of vaping. E-liqs mainly consist of nicotine, propylene glycol and glycerin comprises [2]. Besides these, some aroma components were added to e-liqs contents using different flavors [3]. These products contain zero nicotine or different nicotine ratios. Also propylene glycol and glycerin ratio shows differences in relation to each other in the e-liqs [4,5]. Apart from these, there are also some mixtures that people can prepare themselves. Controlling the nicotine content is necessary for the health of people who used e-cigs because there are toxic effects and poisoning arising from low and high doses of nicotine. Sometimes, over dose toxicity was shown resulting from misuse [6]. There are no regulations about the amount of nicotine, propylene glycol and glycerin in e-liqs at this moment in our country. In addition, despite the prohibition of sales, the consumption of e-liqs has increased rapidly and neither content of them nor how to use them is specified. That's why some restrictions and controls on the content of e-liqs should be introduced. In this study development of easy, reliable, precise and accurate methods for determination of contents of e-liqs is aimed. With this design, for chromatographic separation and quantification of nicotine, propylene glycol and glycerin, analytical methods have been developed and validated. HPLC-DAD system for nicotine and GC-FID system for propylene glycol and glycerin were used. After that some e-liqs which sold in our country were analysed. Sample chromatograms can be seen in Figure 1. As a result, it is shown that these methods could be used to determine content of e-liqs.

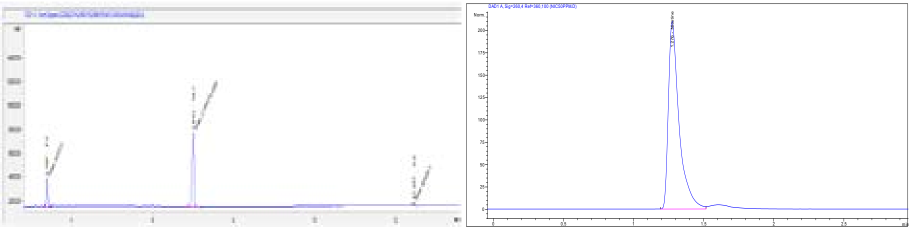

Figure 1: GC-FID chromatogram for propylene glycol and glycerin with HPLC-DAD chromatogram for nicotine

Acknowledgements: This study was supported by TUBITAK, project number 114Z687 and Ege University EBILTEM, project number 2015BİL033.

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Keywords: e-liquids, e-cigarettes, nicotine, HPLC, GC

S-D1-008

SYNTHESIS OF A NOVEL ADSORBENT ''NANO Ni/Fe SUPPORTED ON NUTSHELL' AND THE ADSORPTION OF As(III) AND As(V)

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Arsenic has been known to be a toxic metalloid for centuries. It can be found worldwide at an average concentration of 2 mg/kg [1]. Arsenite (As(III)) is the dominant species under reducing conditions, whereas arsenate (As(V)) is dominant in oxygenated environments [2]. The World Health Organization (WHO) and the United States Environmental Protection Agency (US-EPA) revised the maximum permissible concentration of arsenic in drinking water to 10 μg/L in 1993 [3] and 2001, respectively [4].

Several treatment methods, i.e. adsorption, coagulation, ion exchange, liquid–liquid extraction and reverse osmosis, are used for the removal of arsenic from water For small-scale systems, adsorption methods are preferred for their advantageous properties such as simple handling and operation, lower cost, reusability and low volumes of toxic waste. Iron and its compounds are very often used as adsorbents for the removal of arsenic

In this study, a novel adsorbent Nano Ni/Fe Supported on Nutshell was synthesized for the first time in the literature. The equilibrium parameters were determined for the adsorption of both As(III) and As(V) on Nano Ni/Fe adsorbent using experimental data from batch studies. The uptakes of As(III) and As(V) by the adsorbent were quantitatively evaluated using the Freundlich, Langmuir and Dubinin–Radushkevich (D–R) adsorption isotherms. The adsorption data at equilibrium were well fitted to the Langmuir isotherm for both As(III) and As(V). The maximum adsorption capacities were calculated, according to the Langmuir isotherm, to be 3.6 mg/g and 2.6 mg/g for As(III) and As(V), respectively. The D–R adsorption isotherm showed that the adsorption of the arsenic species on FHSS was favourable. A reusability study confirmed that the adsorbent can be effectively used many times without degradation in performance. The adsorbent was used to perform for the removal of arsenic in water samples. Quantitatively all the As(III) and As(V) species were effectively removed by the adsorbent.

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Keywords: Adsorption, As(III), As(V), Nano Ni/Fe

S-D1-009

SYNTHESIS, IDENTIFICATION, THERMAL ANALYSIS, COMPUTATIONAL, AND ANTIBACTERIAL STUDIES OF Z-N'-(5-BROMOTHIOPHEN-2-YL) METHYLENE)NICOTINOHYDRAZIDE

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Abstract: N'-((5-bromothiophen-2-yl)methylene)nicotinohydrazide Schiff base was isolated and characterized as Zisomer. Ethanoic reflux condensation of equivalent amount of nicotinohydrazideand with 5- bromothiophene-2-carbaldehyde produced the desired compound in good yield. The condensation reaction was monitored by FT-IR and UV-visible as well as DFT calculation. The structure of desired compound wasexperimentally analyzed based on: elemental analysis, EI-Ms, UV-visible, FT-IR spectral, TG/DTG and 1 H-NMR.DFT-computational calculation supportedZ- isomer as favorited product over E one, good accordance between experimental and theoretical calculated were recorded. The antibacterial results obtained using the desired compound indicates a promising result against human pathogenic bacteria.

Keywords: FT-IR, condensation, TG, Schiff bases, DFT.

S-D2-001

THE EFFECT OF SIZING COMPOUND ON THE ELECTROPOLYMERIZATION OF PYRROLE AND THE IMPEDANCE OF MICROFIBER COATED WITH POLY(PYRROLE)

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Carbon Fiber (CF) is used as strengthening material in resin composites having high performance in most industrial area due to that it has mechanical properties such as low weight, high durability and toughness. The mechanical performances of composite materials depend on the features of fiber and matrix which composed them. The one of methods which improves the features of fiber surface is the coating on fiber surface with thin film.[1-4] As coated fiber with electropolymer, as increased the mechanical durability of the composite.[5] Besides ıt was reported that included matrix poly(pyrrole), (PPy), contributed to the durability of composite.[6]

İn this study, carbon fibers was coated with PPy in presence of sizing compound (SC), electrochemically. During process, it was investigated how current, obtained coating weights and impedance data, especially capacitance, changed by the amount of SC.

İn experiments CFs were electrocoated by using 0.1M Py in sodium perchlorate (NaClO4)-ACN in presence of the various amount of SC (%0, %0.18 and %1.8). According to obtained data, the increasing of coating thickness was blocked when more %0.18 SC. The currents flowed in circuit were 17 uA for %0 SC, 13uA for %0.18 SC and 0.4uA for %1.8SC. The coating weights were 0.009mg/g for %0 SC, 16.07 mg/g for %0.18 and 1.73 mg/g for %1.8. Specific capacitance (Csp) values values were 114 µF, 57 µF ve 166 µF and phase degrees were 36°, 61° ve 29° and double layer capacitances (Cdl) were 45 µF den 19 µF ve 17 µF for %0, %0.18 and %1.8 SC, respectively. As result, it may say that SC included in coating solution affect the coating thickness, current and capacitance and impedance values.

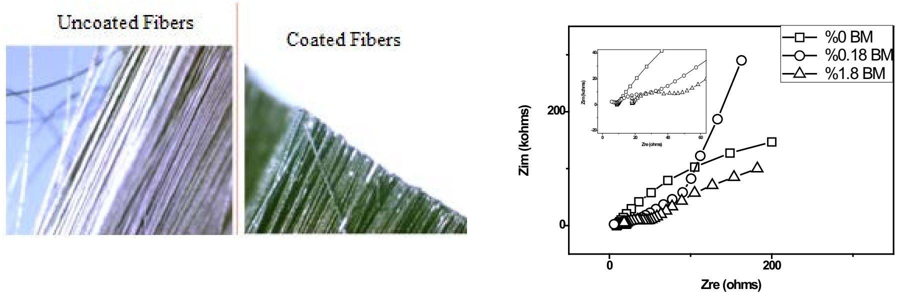

Figure 1. a The comparison of coated fibers with PPy b. The effect of SC on the Nyquist graph of coated fibers with PPy.

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Keywords: Electropolymerization, Sizing Compound,Impedance, Capacitance.

S-D2-002

VOLTAMMETRIC BEHAVIOR OF ACEBUTOLOL ON A PENCIL GRAPHITE ELECTRODE: HIGHLY SENSITIVE DETERMINATION IN PHARMACEUTICALS AND HUMAN URINE BY SQUARE-WAVE VOLTAMMETRY

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Acebutolol(ACE) [(±)-3'-Acetyl-4'-(2-hydroxy-3-isopropylaminopropoxy) butyranilide] is a cardio selective β-blocker used in the management of hypertension, angina pectoris and cardiac arrhythmias [1]. Many modern separation methods with excellent sensitivity and selectivity such as gas chromatography with mass spectrometry, liquid chromatography, capillary electrophoresis, and spectrophotometry are mostly dominating determination of ACE in different matrices (e.g. urine, blood, serum, plasma, pharmaceuticals) in analytical and clinical laboratories. However, according to our knowledge, there are four study available for the determination of ACE by the electrochemical method based on potentiometry [2,3] and voltammetric [4,5]. The electrochemical investigation of ACE, beta-blocker drug, was carried out in in alkaline media using a pencil graphite electrode (PGE). In cyclic voltammetry, the compound showed reversible and adsorption-controlled oxidation peak (Fig. 1). Using square-wave anodic stripping voltammetry, the current showed a linear dependence with concentration in the range between 0.4-7 nM in Britton-Robinson buffer, pH 10.0. This method was successfully applied for the analysis of ACE in pharmaceutical formulations and urine.

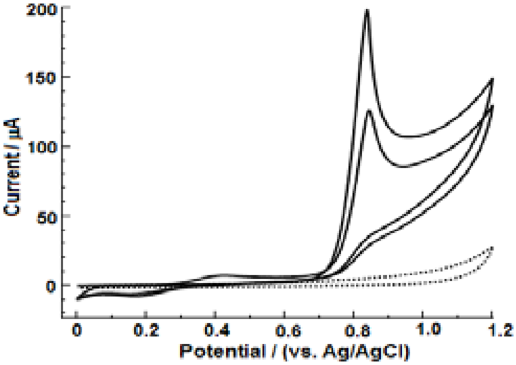

Figure 1. Multisweep cyclic voltammograms in BR buffer at pH 10.0. ACE concentration, 1 mM; scan rate, 100 mV s^{-1}.

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Keywords: Acebutolol, pencil graphite electrode, square-wave voltammetry

S-D2-003

EFFECT OF ASCORBIC ACID ON THE CORROSION BEHAVIOR OF COPPER IN A NEUTRAL MEDIUM

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In this study, the effect of Ascorbic acid in the electrochemical behaviour of copper has been investigated in 3.5% *NaCl* solution using potentiodynamic polarization and electrochemical impedance spectroscopy (EIS). Current-potential curve and Nyquist diagrams were obtained in different concentrations of Ascorbic acid. The surface morphology of copper after their exposure to 3.5% *NaCl* solution with and without of Ascorbic acid was examined by scanning electron microscopy (SEM). The obtained results show that, Ascorbic acid inhibits corrosion of copper in 3.5% *NaCl* solution.Inhibition activity was determined to increase with decrease in the concentration of Ascorbic acid.

Keywords: Copper, Electrochemical techniques, Corrosion, Adsorption isotherm

S-D2-004

THE DETERMINATION OF FRUIT CONCENTRATED OF INHIBITION EFFECT OF LYCIUM BARBARUM OF THE ELECTROCHEMICAL BEHAVIOR OF THE COPPER IN CHLORIDE MEDIUM

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In this study, the effect of Lycium barbarum in the corrosion behaviour of copper has been investigated in 3.5% NaCl solution using potentiodynamic polarization and electrochemical impedance spectroscopy (EIS). Current-potential curve and Nyquist diagrams were obtained in different concentrations of Lycium barbarum. The surface morphology of copper after their exposure to 3.5% NaCl solution with and without of Lycium barbarum was examined by scanning electron microscopy (SEM). The obtained results show that, lycium barbarum inhibits corrosion of copper in 3.5% NaCl solution. Inhibition activity was determined to increase the concentration of Lycium barbarum.

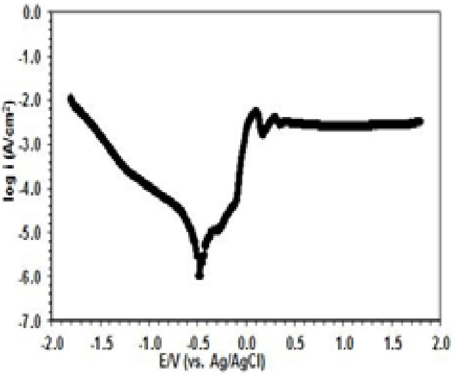

Figure 1: The current–potential curve of copper obtained in 3.5 % NaCI solution

Acknowledgements: In this study, Cukurova University Scientific Research Projects Coordination Unit is Supported. Project Number: FB-2016-6571

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Keywords: Copper, Electrochemical techniques, Corrosion, Adsorption isotherm, Lycium barbarum

S-D2-005

SYNTHESIS OF GOLD NANOPARTICLES ON GC ELECTRODE SURFACE MODIFIED WITH DIAZONIUM METHOD

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The deliberate modification of electrode surfaces by covalently attached molecules has received extensive attention due to their potential applications in the field of microelectronics technology, energy storage and chemical catalysis [1]. One of the widely used methods for surface functionalization is based on electrochemical reduction of aryl diazonium salts [2]. In this methods following one-electron reduction, dinitrogen is eliminated leaving an aryl radical which binds to the surface. Many types of organic films have been electrografted to carbon, metal, and semiconducting substrates from diazonium salt solutions [3].

In recent years, the modification of electrodes with nanomaterials, in order to provide the electrode with enhanced properties, has received considerable attention for applications such as bioelectronics, catalysis, and electroanalytical chemistry. [4] Metal nanoparticles, especially gold nanoparticles (AuNPs), have been extensively studied because of their attractive physicochemical characteristics, such as high surface-to-volume ratio, and being able to facilitate electron transfer between molecules and electrodes [5].

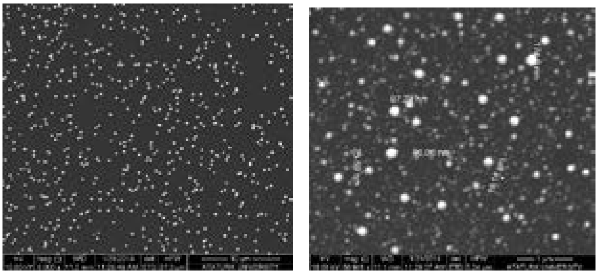

Figure 1. SEM image of Gold nanoparticles on the GC electrode surface modified with diazonium method

In this work, we purposed to synthesis and characterization of gold nanoparticles (AuNPs) on glassy carbon (GC) electrodes modified with diazonium method. This study was actualized in two steps. Firstly, the electrode was in-situ modified by electrochemical reduction of diazonium salts by using 1,10-phenanthroline molecule. Modified electrode immersed in solution of tetrachloroauric acid ($HAuCl_4.3H_2O$) along 24 hour after that electrochemical reduction was performed. The structural characterization and morphological images of AuNPs were examined by X-ray photoelectron spectroscopy (XPS) and scanning electron microscopy (SEM), respectively. Catalytic behavior of surface coated with AuNPs was investigated in nitrobenzene and hydrazine hydrate solutions.

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Keywords: Gold Nanoparticles, Diazonium method, GC electrode

S-D2-006

ANTICORROSIVE PROPERTIES OF POLY(PYRROLE-co-2-CHLOROANILINE) ON ALLOY PLATED ELECTRODE

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Protective coatings have been used widely for metal corrosion control. Among these are organics, slicones, inorganic compounds and metallic coaings [1]. Conducting polymers like polyaniline and polypyrrole have shown wide range of applications due to their very interesting physical properties. Some of their important properties include electrical conductivity, electroactivity, electrochromism, environmental stability, chemical stability and corrosion inhibitive property. Due to these properties, they are widely used in rechargeable battaries, electrochromic displays, ion-exchangers, pH sensors, gas sensors and primers for corrosion protection of steel [2].

In this study, zinc–iron alloy plating (ZnFe) was successfully deposited on carbon steel (CS) applying current of 3 mA with galvanostatic technique. Poly(pyrrole-co-2-chloroaniline) film was synthesized with cyclic voltammetry technique from 0.025 M aniline and 0.025 M 2-chloroaniline containing 0.20 M sodium oxalate solution on zinc–iron plated carbon steel (CS/ZnFe) electrode. Poly(pyrrole-co-2-chloroaniline) film characterized by scanning electron microscopy (SEM) and linear sweep voltametry (LCV) techniques. The corrosion behaviour of zinc–iron deposited carbon steel electrodes with and without Poly(pyrrole-co-2-chloroaniline) film in 3.5% NaCl solution was investigated with AC impedance spectroscopy (EIS) technique and anodic polarization curves. The results showed that Poly(pyrrole-co-2-chloroaniline) film provided an effective barrier property on zinc–iron coating and a remarkable anodic protection to substrate for longer exposure time.

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Keywords: Poly(pyrrole-co-2-chloroaniline), corrosion, metalling coating

S-D2-007

MISENS DEVICE AS A NEW AUTOMATED BIOSENSING PLATFORM BASED ON REAL-TİME ELECTROCHEMİCAL PROFILING (REP)

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In various fields like health, environmental control, food security and military defense; there is an increasing demand for on-site detection, fast identification and urgent response which brings the necessity to employ laboratory detection procedures on standalone automatic devices. In response to that TUBITAK BILGEM's Bioelectronic Devices and Systems Group has been developing portable and fully automated biosensor devices using optical and electrochemical biosensor detection techniques. Here we describe a new integrated and fully automated lab-on-a-chip based biosensor device 'MiSens'. The key features of the MiSens include a new electrode array, an integrated microfluidic system and real-time amperometric measurements during the flow of enzyme substrate. While simple protocols can be controlled from the LCD display on the device, other main device control procedures can be run wireless by a tablet/PC using the MiCont™ software developed by the team.

For the device, a new plug and play type sensor chip docking station has been designed that with one move it enables the formation of a ~ 7-10 µl capacity flow cell on the electrode array with the necessary microfluidic and electronic connections. The MiSens device has been developed by our multi-disciplinary team by integrating and automatising the earlier developed sensing platform REP™ (Real-time Electrochemical Profiling). The performance of the MiSens device has been tested using cyclic voltammetry and amperometry tests (by means of an immunoassay) and the results were compared with an of the shelf potantiostat. In the presentation, the results of the MiSens device performance tests will be given in detail in addition to the case studies for the detection of analytes.

Keywords: electrochemistry, biosensor, microfluidics, nanotechnology

S-D2-008

INVESTIGATION OF SURFACE HARDNESS OF THE ELECTROLYTIC HARD CHROMIUM COATED STEELS DEPENDING ON PROCESS PARAMETERS

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Coatings improve the surface properties of metallic and non-metallic materials and increases their range of applications. Electroplated coatings are important process for protection against particle impact, abrasion, erosion, high temperature oxidation, corrosion and wear as well as for reducing friction. Protective effect of coatings depends on their chemical composition, thickness, hardness, microstructure as well as on their cohesion to the substrate material. For coatings thickness standards are important for avoiding porosity and ensuring good resistance to wear and corrosion.

The aim of this work is to evaluate the hardness properties of AISI 1040, AISI 4140 ve AISI 8620 steels coated hard chromium with electroplating. The effect of processing time on the microhardness and thickness of the coating was investigated. The coating thickness and surface hardness values were found to be increased depending on the coating process time.

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Keywords: Electroplating, hardness, thickness

S-D2-009

ACETYLCHOLINESTERASE-CHOLINE OXIDASE BIOSENSOR BASED ON MULTI-WALLED CARBON NANOTUBES- IRON OXIDE NANOPARTICLES-CHITOSAN NANOCOMPOSITE

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Acetylcholine, ACh is one of many neurotransmitters in the nervous system and it plays an important role in the central nervous system. It is stored in brain cells and released into the synaptic cleft upon stimulation. It acts on both the peripheral nervous system and central nervous system and is the only neurotransmitter used in the motor division of the somatic nervous system. Thus, the determination of ACh is clinically very important due to the relation of ACh with several neural disorders such as Alzheimer's disease and dementia. [1, 2]

In this study, an amperometric bienzymatic biosensor based on carboxlylated multi-walled carbon nanotubes (c-MWCNT) and iron (II, III) oxide nanoparticles (Fe_3O_4NP) and chitosan (CHIT) modified glassy carbon electrode (GCE). AChE and ChOx enzymes were immobilized on composite film by cross-linking with 1-ethyl-3-(3-dimethylaminopropyl)-carbodiimide (EDC) and *N*-hydroxysuccinimide (NHS). Determination of ACh was carried out by oxidation of enzymatically produced H_2O_2 at 0.4 V vs. Ag/AgCl. The surface properties of nanoparticles modified electrodes were studied by scanning electron microscopy (SEM) Electrochemical behavior of modified electrodes was investigated by using cyclic voltammograms (CVs) and electrochemical impedance spectroscopy (EIS) and compared with those of the bare GCE. The working potential was selected as +0.4 V. The synergistic effect of Fe_3O_4NP and c-MWCNT showed excellent electrocatalytic activity at low potential (+0.4 V). Amount of AChE and ChOx enzymes, working pH and temperature were optimized. GCE/CHIT-MWCNTs-Fe_3O_4 showed high sensitivity and wide working range towards ACh. [3, 4] The reusability, storage stability and interfering effects of L-ascorbic acid, L-cysteine, acetaminophen and uric acid were investigated. GCE/CHIT-c-MWCNT-Fe_3O_4NP/AChE-ChOx/Naf biosensor was used for determination ACh in human serum samples.

Acknowledgements: This work was supported by Ankara University Scientific Research Fund (BAP) (Grant no: 14H040008).

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Keywords: nanoparticles, acetylcholineesterase, choline oxidase, biosensor

S-D3-001

POTENTIOMETRIC CARBONATE DETERMINATION IN DRUG TABLETS CONTAINING $MgCO_3$ OR $CaCO_3$ AS ACTIVE INGREDIENT

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Carbonates play an important role in the field of health. So, accurate, rapid and direct determination of carbonate ions is of major importance [1]. In clinical analyses, carbonate determination method is based on the use of potentiometric carbon dioxide gas sensors [2].In these sensors, carbonate ions are transformed to carbon dioxide form and carbonate ions are determined indirectly by measuring carbon dioxide concentration. Therefore, there is a need of a durable carbonate sensor for direct determination of carbonate in industrial applications such as drug sample analyses. Recently, many carbonate sensors have been developed for the direct determination of carbonate ions. However, most of these sensors have either very limited life time or high interference effect. Additionally, linear working ranges and detection limits of them are not very satisfied [3-8].

In the current study, a potentiometric carbonate sensor based on polymer membrane has been developed and its all potentiometric performance characteristics such as linear working range (1.0×10^{-6}-1.0×10^{-2} $molL^{-1}$), selectivity coefficients according to matched potential method (NO_2^-: 2.91, CH_3COO^-: 2.12, Br^-: 2.91, Cl^-: 1.89, SCN^-: 1.86, F^-: 2.35, ClO_3^-: 2.81, NO_3^-: 2.17, HSO_4^-: 2.66, HCO_3^-: 2.65, BF_4^-: 2.71, I^-: 1.87, IO_3^-: 2.07, $B_4O_7^{2-}$: 2.29, SO_3^{2-}: 2.26, SO_4^{2-}: 2.38, HPO_4^{2-}: 2.11, CrO_4^{2-}: 2.47, $Cr_2O_7^{2-}$: 2.37, PO_4^{3-}: 1.97), pH working range (pH=5.0-9.0), response time (<8s), limit of detection (8.4×10^{-7} $molL^{-1}$) and life time (8 week) have been investigated. Additionally, the developed carbonate sensor has been used for the direct potentiometric determination of carbonate contents of some drug tablets containing $MgCO_3$ or $CaCO_3$ as active ingredients. The obtained analysis results were statistically compared with the labeled values of drugs. The statistical results showed that the carbonate contents determined by the developed electrode are almost the same with those of the claimed values for drug tablets at 95% confidence level.

Acknowledgements: Sensor development stage of this work was supported by the project numbered as FEN-C-YLP-300614-0101 (Office of Scientific Research Projects, Erzincan University).

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Keywords: Potentiometric carbonate determination, carbonate sensor, drug analysis

S-D3-002

AN AMPEROMETRIC XANTHINE BIOSENSOR BASED ON 7,7′,8,8′-TETRACYANOQUINODIMETHANE/MULTIWALLED CARBON NANOTUBES/METAL OXIDE NANOPARTICLES COMPOSITE: Fe_3O_4 VERSUS Co_3O_4

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Xanthine concentration is used as an index for evaluating the fish freshness in food industry. After the death of a fish, xanthine is a major metabolite in the degradation of adenosin triphosphate (ATP) in the fish meat. During the storage of the fish ATP is degraded into adenosine diphosphate, adenosine monophosphate, inosine 5 -phosphate, inosine, hypoxanthine, xanthine and uric acid. The degradation product xanthine accumulates with the increased storage time and may be used as an indicator of the freshness of the fish [1]. In recent years, nanomaterials have found numerous applications in biosensors due to their unique structural, electronic and mechanical properties. Multiwalled carbon nanotubes (MWCNTs) and metal oxide nanoparticles have enhanced electonic properties, a large edge plane/basal plane ratio, chemical stability, mechanical strength and rapid electrode kinetics [1, 2]. Some biosensors include the electrode surface modification through the use of different mediators, with the main goal of decreasing the working potential, thus, avoiding electrochemical interferences [3]. 7,7′,8,8′-tetracyanoquinodimethane (TCNQ) mediator has being used as mediator in the construction of biosensors, because it has great number of properties, as high electric conductivity [4].

In this study two enzyme electrodes based on TCNQ, MWCNTs and Fe_3O_4 nanoparticles or TCNQ, MWCNTs and Co_3O_4 nanoparticles were fabricated as novel biosensing platforms for xanthine determination and their performances were compared. Xanthine oxidase (XO) was immobilized covalently via *N*-ethyl-*N*¢-(3-dimethyaminopropyl) carbodiimide and *N*-hydroxyl succinimide chemistry onto the composite films. The electrochemical measurements were based on a conventional three-electrode system with a Ag/AgCl electrode as the reference electrode, a platinum wire electrode as the counter electrode and the modified glassy carbon electrode (GCE) as the working electrode. The influences of the amount of TCNQ, MWCNTs, nanoparticles and enzyme were investigated to determine the optimum composition of the biosensors. The properties of XO/Co_3O_4/MWCNTs/TCNQ/GCE and XO/Fe_3O_4/MWCNTs/TCNQ/GCE were characterized by scanning electron microscopy, cyclic voltammetry and electrochemical impedance spectroscopy. Optimum working conditions of the biosensors were investigated and the analytical performance of the biosensors was compared with respect to detection limit, linearity, repeatability and stability. The linear working range and detection limit of the Fe_3O_4 based xanthine biosensor was superior to the Co_3O_4 modified biosensor. The proposed xanthine biosensors were tested in real samples for the determination of xanthine.

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Keywords: Xanthine oxidase; Amperometry; Fe_3O_4 nanoparticles; Co_3O_4 nanoparticles; Multiwalled carbon nanotubes; 7,7′,8,8′-tetracyanoquinodimethane

S-D3-003

AMPEROMETRIC L-LYSINE BIOSENSOR BASED ON GRAPHENE/C-MWCNT/SNO_2 COMPOSİTE MODIFIED GLASSY CARBON ELECTRODE

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L-lysine is an essential amino acid for animal and human nutrition, not synthesized in man and other mammals so it has to be assimilated with food intake. It is often applied as a dietary supplement in functional food and pharmaceutical products in order to correct possible deficiencies of this amino acid in humans. Owing to this, many efforts have been devoted to devise simple and sensitive analytical methods to detect L-lysine in real matrices. Several methods including gas or liquid chromatography coupled with MS, UV or fluorescence detection have been described for quantitative determination of L-lysine. Biosensors can be promising alternatives to the above mentioned methods due to their selectivity, low-cost, reduced analysis time and possible application on site [1, 2]. Carbon based nanomaterials, have attracted great research interests in recent years due to their attractive properties and applications in many areas. Especially, one-dimensional carbon nanotubes (CNTs) and two-dimensional graphene (GR), have been widely investigated as biosensing material using the unique mechanical, electrical, optical and chemical properties. Specifically, the large surface area-to-volume ratio of these carbon-based materials make them prime candidates for sensing applications [3, 4]. Nanofabricated metal oxides also have been successfully applied in the field of biosensing systems. Metal oxide nanoparticles are of particular interests and have received much attention because of their unique physical, chemical and catalytic properties [5].

In this study, the excellent properties of carbon based materials and metal oxide nanoparticles have been combined to provide a new approach for highly sensitive L-lysine determination. A new L-lysine biosensor was constructed based on graphene, carboxylated multiwalled carbon nanotubes and SnO_2 nanoparticles (GR/c-MWCNTs/SnO_2) composite. Lysine oxidase (LyOx) was immobilized covalently onto SnO_2/c-MWCNTs/GR/GCE using N-ethyl-N'-(3-dimethyaminopropyl) carbodiimide and N-hydroxylsuccinimide chemistry. Finally, nafion solution was drop-coated on the LyOx/SnO_2/c-MWCNTs/GR/GCE biosensor in order to prevent enzyme leakage and eliminate possible interferences. The morphology of the LyOx/SnO_2/c-MWCNTs/GR/GCE has been investigated by scanning electron microscopy (SEM), and the electrochemical performance of the biosensor has been researched by amperometric method. Electron transfer properties of this biosensor was investigated in 0.1 M KCl support electrolyte containing $Fe(CN)_6^{3-/4-}$ as redox probe by cyclic voltammetry (CV) and electrochemical impedance spectroscopy (EIS) methods. The effect of the amount of GR, c-MWCNTs, SnO_2 and enzyme were investigated to determine the optimum composition of the biosensor. The parameters that influence the electrode performance, the analytical characteristics, operational and storage stability and the effect of interferences were investigated. The proposed biosensor exhibited enhanced electrocatalytic activity and good response performance to L-lysine. Also, LyOx/SnO_2/c-MWCNTs/GR/GCE tested in pharmaceutical L-lysine tablet for the determination of L-lysine.

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Keywords: Amperometry, Carboxylated multiwalled carbon nanotube, Metal oxide nanoparticle, Lysine oxidase, L-lysine, Biosensor

S-D3-004

A NEW CAPACITIVE GAS CHROMATOGRPHY DETECTOR BASED ON DIELECTRIC MEASUREMENT

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Gas Chromatography (GC) is a separation technique containing stationary and gas mobile phases where the components of a mixture can be separated. GC is a preferred separation method if the separation requires small amount of sample and the sample that can be easily transformed into volatile derivatives to sweep into analytical column by aid of a mobile inert gas phase like N_2, Ar or He. The so called elution process is achieved in analytical column with 30-100 m length to which a detector is connected in modern GC systems. The separated compounds are detected and determined quantitatively depending on measuring physical property by a suitable detector such as Thermal Conductivity Detector (TCD), Flame Ionization Detector (FID), Electron Capture Detector (ECD) and Nitrogen Phosphor Detector (NPD) in 95% of the GC applications [1]. GC techniques and detectors became nearly stable in the last ten years and no new commercial detectors are produced recently.

A new GC detector has been developed in this work which is selective for polar compounds depending on measurement of dielectric permeability [2]. A capillary column is used as a cell. 100 Hz sinus signal is applied to this column cell to obtain induced signal from polar species passing through the column. The induced signals are demodulated and amplified by lock-in-amplifier (LIA) then sent to a plotter or integrator to obtain chromatogram [3]. The block diagram of this capacitive detector is shown in the figure.

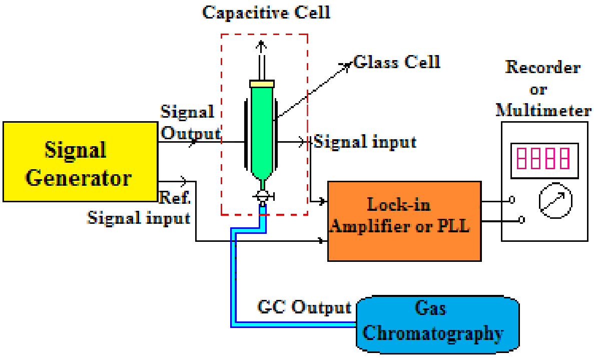

Figure. Block scheme of the Capacitive Detector

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Keywords: Gas Chromatogrphy, Capacitive Detector, Dielectric Measurement

S-D3-005

SYNTHESIS, CHARACTERIZATION, AND CHEMOSENSING APPLICATION OF POLY(METHYL METHACRYLATE-CO-HYDROXYETHYL METHACRYLATE) WITH DANSYL SIDE GROUP

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Considerable scientific efforts have been focused on the development of fluorescent chemosensors due to their sensitivity, selectivity, and response time [1,2]. Dansyl fluorophore, with dimethylamino moiety as a donor part and naphthalene sulfonyl as an acceptor part, gives fluorescence emission in the visible region which is sensitive to changes in polarity and pH of the analytical media [3]. Therefore, it has been widely employed as a fluorescence probe toward various materials, such as nitroaromatic compounds, anions, metal cations, and biological substrates.

In this study, we are reporting synthesis, characterization, and chemosensing application of novel dansyl-functional methyl methacrylate-*co*-2-hydroxyethyl methacrylate (MMA-HEMA) copolymers (**P2**) (Figure 1). To the best of our knowledge, this is the first report on the synthesis and chemosensing application of dansyl-functional MMA-HEMA copolymers which were prepared in a two-step synthetic procedure, including free radical polymerization (FRP) of MMA and HEMA monomers and esterification reactions. Chemical structures of the obtained polymers were confirmed by FT-IR and ^{1}H NMR spectroscopic techniques. Then, **P2** polymers were used as fluorescent probes toward various metal cations.

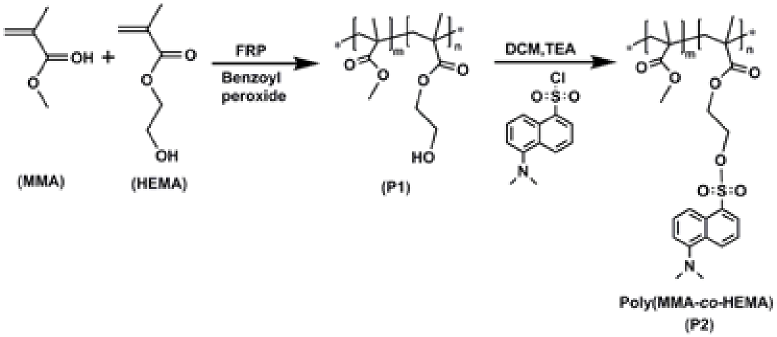

Figure 1. Synthetic procedure for the preparation of dansyl functional poly(MMA-*co*-HEMA) (**P2**).

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Keywords: Chemosensing, Dansyl, MMA, HEMA

S-D3-006

FOR THE DETERMINATION BLOOD GLUCOSE LEVELS TO DESIGN A SECOND GENERATION BIOSENSOR BASED ON GLUCOSE OXIDASE ENZYME

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The detection of glucose is very important in various fields including health-disease, agriculture and food industries. Accurate and reliable determination of glucose has been widely investigated using spectrophotometric, electrochemical, amperometric, polarimetric, piezoelectric Technologies [1,2]. Among these methods, electrochemical detection is a most promising approach to achieve accurate, separate and rapid glucose monitoring with using biosensor system [3].

Glucose oxidase (GOX) enzyme immobilized on the surface of gold electrode with the help of gelatin, bovin serum albumin (BSA) and glutaraldehyde (GA) crosslinker. For experimental case we prepared 3 different combination on the gold electrode surface. These electrodes ;GOX/Gelatin/GA-Au ,GOX/BSA/GA-Au and GOX/Gelatin/BSA/GA-Au. Bioactive layer was created in the end of this processes. During the biosensor preparing benzoquinone selected as a mediator in working buffer and glucose measurements were carried out at -0.7 V.

We designed of biosensor for the optimization of the preparation condition, looked at the impact of the BSA, gelatin, glutaraldehyde, pH,buffer concentration. Characterization of the biosensor commitment to the work process and answer reproducibility were evaluated. The electrochemical response of the enzyme electrode was linearity gradually leveled off at higher concentration. We found that crosslinking of the glucose oxidase with glutaraldehyde could be achieved over a wide range of relative mole ratios in 50 mM phosphate buffer at pH 7.5, glutaraldehyde concentration of %2.5.

In this study, a new technique has been developed for glucose biosensors, which features effective

combination of GOX/ Gelatin / BSA /GA modified electrode. The new technique is reliable and cost effective and the prepared glucose sensor has exhibited very good performance, such as low detection limit, fast response time, high selectivity and long-term stability. It may have provided a promising platform for the development of many other biosensors based on some distinct electrode materials.

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Keywords: GOX, Biosensor, Electrochemistry

S-D3-007

DETECTION OF A-THALASSEMIA 3.7 KB. DELETION MUTATION USING PIEZOELECTRIC BIOSENSOR IMMOBILIZED WITH A SINGLE OLIGONUCLEOTIDE

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α-Thalassaemia is the most monogenic autosomal recessive disorder characterized by defective production of the α-chain of hemoglobin. [1] It cause syndromes, they are a group of hereditary anemias of varying clinical severity. [2] Definition of the α-globin genotype in carriers supports genetic counselling, and in patients with Hb H disease is useful to predict prognosis and management options. DNA-based diagnosis of α-thalassemias routinely relies on polymerase chain reaction(PCR) and gel electrophoresis. [3] The aim of this study, developing a new procedure for the detection of α–thalassemia 3.7 Kb. deletion using a 3-primer system for PCR coupling with a DNA-based piezoelectric biosensor.

For this study, PCR products amplified from genomic DNA, which was obtained by Gap PCR techniques (amplification using oligo-primers flanking deletion breakpoints). [4] These products were detected directly by using a quartz crystal microbalance. We immobilized with a single oligonucleotide probe with Poly Hema-Mac nanopolymer. Than we compare the results with jel electroprosis.

The frequency changes after hybridization of the PCR products amplified from a representative sample of normal α-globin, 3.7 Kb. deletion α-thalassemia heterozygote, and homozygote were 211±14, 267±8, and 314±6 Hz, respectively.

The biosensor was evaluated through an examination of 3 blind specimens. It could accurately discriminate between normal and 3.7 Kb. deletion α-thalassemic samples, which suggests that this biosensor system is a promising alternative technique to detect 3.7 Kb. deletion α-thalassemia because of its specificity and less hazardous exposure as compared with conventional methods. This technique is faster and cheaper than other techniques.

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Keywords: Biosensor, Alpha Thalassemia, Genetic

S-D4-001

USING NATURAL STONE PUMICE IN VAN REGION ON ADSORPTION OF SOME TEXTILE DYES

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Toxic effect of textile dyes their increasing quantities in air, soil and water environments, because of growing of industrial actives, must take into consideration since they harm to environment. We come across textile dyes in natural wetlands as result of uncontrolled industrial wasted. Textile dyes that can accumulate easily in their environments may show toxic effects.

Pumice, accruing as result of volcanic events and durable against chemical factors, is a rock that has porous structure. Pumices have a porous structure because of sudden cooling of the rock and sudden leaving of gases a result of volcanic events. Thanks to these pores, pumices heat and sound insulation are quite high. The most distinctive feature of pumice from other rocks is that it has different colors and there is not crystal water in its porous structure.

Adsorption studies are applied with Van Pumice at pH = 6, the adsorption mechanism and changing metal concentration. As result of these researches, it has been found that there are different adsorption movements at pH 6 between textile dyes and Van Pumice.

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Keywords: Textile dyes, Adsorption, Isotherm, Van Pumice, Thermodynamic

S-D4-002

BIOSORPTION OF METHYLENE BLUE FROM AN AQUEOUS SOLUTION BY IRON OXIDE-COATED *CYSTOSEIRA BARBATA*

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Water pollution mostly comes from industrial and environmental pollutants [1] and one of the most important pollutants is colorant agency. Dye manufacturing is toxic and cause several environmental problems. Dyes are mainly used in textile, plastics, tanneries, pharmaceuticals, leather, paint and electroplating industries [2]. Several methods such as biosorption, chromatography, membrane separation, ion exchange have been tested for the adsorption of dyes since they have toxic effects on aquatic environment and human bodies, [3, 4, 5]. In recent years, the use of magnetic separation with biosorption has increased [6]. In this study, *Cystoseira barbata* (Stackhouse) C. Agardh meal was coated with iron oxide (Fe_3O_4) to obtain magnetic biomaterial. *C. barbata* was collected from Dardanos Campus of Canakkale Onsekiz Mart University. The biomass was washed to remove some impurities and dried in an oven at 60°C until constant weight was reached. Dried biomass was ground, sieved and coated with Fe_3O_4. For pH experiments, 10 ppm 10 ml MB solutions at different pH (2, 3, 5, 7, 9) was added in 50 mL Falcon tube. The Falcon tubes were shaken at 250 rpm at room temperature for 120 min, then samples were centrifuged at 3000 rpm and supernatants were measured by the spectrophotometer. The effect of contact time (10, 25, 45, 60, 80, 100, 150, 200 and 300 min.) and the different temperatures (25˚C and 45 ˚C) were also investigated. For biosorption experiments, stock methylene blue (MB) solution (1000 mg/L) was used and nine concentrations (5-10-20-50-75-100-150-200-300 mg/L) were prepared from stock MB solution using distilled water. The equilibrium data were analyzed with Langmuir and Freundlich isotherms. The results showed that the maximum adsorption capacities were reached at the end of 200 min. at pH 2 and the amounts were found to be 5,74 mg/g and 1,08 mg/g at 25˚C and 45˚C respectively.

Acknowledgements: This study has been funded by Canakkale Onsekiz Mart University research foundation (BAP, Project no: FBA-2015-427).

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Keywords: Methylene blue, biosorption, C. barbata

S-D4-003

ELECTROCHEMICAL DECOLORIZATION OF REACTIVE VIOLET 5 TEXTILE DYE USING PT/IR ELECTRODES

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In this study, electrochemical decolorization of textile dyeing wastewater containing Reactive Violet 5 (RV5) were investigated using Pt/Ir electrodes in the presence of 75%NaCl+25%Na_2CO_3 (w/w) supporting electrolyte mixture in a batch electrochemical reactor. Influence of experimental parameters were operated in the range of 300-1500 mg/L textile dye concentration, 4-20 g/L electrolyte concentration, 5-15 mA/cm^2 current density, and 20-60°C reaction temperature in 15 min electrolysis time. Reactive Violet 5 (RV5) decolorization increased with increasing electrolyte concentration, current density and reaction temperature, while decreasing the textile dye concentration. Depending on electrochemical reaction conditions, Reactive Violet 5 (RV5) textile dye decolorization were obtained between 42.8-100%.

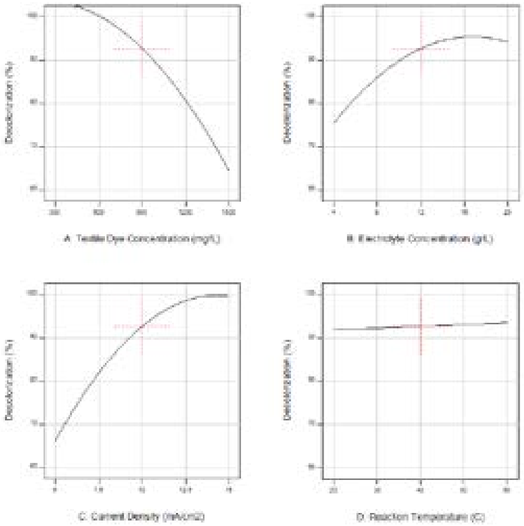

Figure 1: Influence of process parameters on electrochemical decolorization of Reactive Violet 5 (RV5) textile dye using Pt/Ir electrodes

Acknowledgements: This project was supported by Mersin University Scientific Research Projects Center (MEÜ BAP) with Grant No. 2015-TP2-1037.

Keywords: Decolorization, Electrochemical Wastewater Treatment, Pt/Ir Electrodes, Reactive Violet 5, Textile Dye.

S-D4-004

EVALUATION OF ENERGY CONSUMPTION IN ELECTROCHEMICAL OXIDATION OF ACID VIOLET 7 TEXTILE DYE USING PT/IR ELECTRODES

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In this study, the influences of process parameters were investigated on the electrochemical oxidation of textile dyeing wastewater containing Acid Violet 7 (AV7) using Pt/Ir electrodes in the presence of 75%NaCl+25%Na_2CO_3 (w/w) supporting electrolyte mixture in a batch electrochemical reactor. Influence of experimental parameters were operated in the range of 300-1500 mg/L textile dye concentration, 4-20 g/L electrolyte concentration, 5-15 mA/cm^2 current density, and 20-60°C reaction temperature in 120 min electrolysis time. Energy consumption decreased with increasing textile dye concentration, electrolyte concentration and reaction temperature, while decreasing the current density. In the study, energy consumption values were evaluated for textile dye decolorization (t=15 min) and COD removal (t=120 min) as 2.74-23.32 kWh/kg dye removed and 50.96-317.94 kWh/kg COD removed, respectively.

Table 1: Influence of process parameters on energy consumption in electrochemical oxidation of textile dyeing wastewater containing Acid Violet 7 (AV7) using Pt/Ir electrodes

Parameter	**E (kWh/kg dye removed) (t = 15 min)**	**E (kWh/kg COD removed) (t = 120 min)**
Textile dye concentration	4.48 - 18.85	83.49 - 169.78
Electrolyte concentration	5.90 - 14.95	94.17 - 177.26
Current density	2.74 - 13.78	50.96 - 190.73
Reaction temperature	6.42 - 9.29	97.71 - 113.29

Acknowledgements: This project was supported by Mersin University Scientific Research Projects Center (MEÜ BAP) with Grant No. 2015-TP2-1037.

Keywords: Acid Violet 7, Electrochemical Wastewater Treatment, Energy Consumption, Pt/Ir Electrodes, Textile Dye.

S-E1-001

FACILE SYNTHESIS OF UNPRECEDENTED HETERONUCLEAR PHTHALOCYANINE RING AND ITS EVALUATION IN PHOTODYNAMIC THERAPY

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Phthalocyanines have been found useful in a wide range of industrial applications, such as dyes and pigments, chemical sensors, catalysts, medical applications, and photosensitizers for photodynamic cancer therapy due to their extraordinary thermal and chemical stabilities with the unique electrochemical and spectroscopic properties [1,2]. Therefore, an unprecedented heteronuclear phthalocyanines ring 4 (figure 1), was designed and prepared by using phenolic -OH groups of previously synthesized across adjacent ring formed copper and zinc phthalocyanines and titanium isopropoxide [3]. The target 5 has been synthesized from *1,1,2,2-tetrakis(p-hydroxy-phenyl)-ethane* and 4. The water-soluble form of 5 was acquired from the boiling suspension of the compounds in aqueous 20% KOH solution. The synthesized molecules have been characterized by ICP, UV-Vis and MALDI-TOF mass spectroscopies. 3D geometric conformations of the phthalocyanines were created by using Gaussian software with HF theory at the B3LYP/3-21G level. The water-soluble phthalocyanine was evaluated in photodynamic cancer therapy under 100 J/cm2 and 150 mW/cm^2 red light which was produced by Waltmann PDT 1200 L. To determine dark and PDTmediated toxicities of bare and phosphonolipids (max. 5%) charged phthalocyanine concentrations (0.625, 1.25, 2.5, 5 and 10 μM) on human lung carcinoma (A549) and keratinocyte (HaCaT) cells, *in vitro* MTT and LDH assays were performed. The obtained results from cell viability and membrane degradation assays were consistent with each other. The water-soluble heteronuclear phthalocyanine showed no dark toxicity but concentration dependent light toxicity. However, phosphonolipids charging was not found obviously effective to increase the anti-proliferative activity due to the high molecular size of heteronuclear phthalocyanine. Consequently, we think that this facile synthesized heteronuclear phthalocyanine would be found useful in a wide range of industrial fields, although its application in photodynamic therapy seems to be limited. The further studies with this unprecedented molecule in other application fields should be, therefore, devised and actualized.

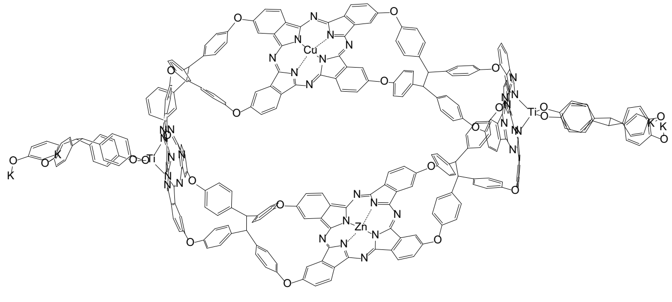

Figure 1: Chemical structure of the facile synthesized and unprecedented heteronuclear phthalocyanine ring.

Acknowledgements: This research was financially supported by the Commission of Scientific Research Projects of Anadolu University, Turkey [Project no: AÜBAP-1309F320].

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Keywords: Phthalocyanines, Photodynamic Therapy, Heteronuclear Phthalocyanine Ring

S-E1-002

ANTI-HEMOLYTIC EFFECT OF THREE *SALVIA* SPECIES

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Hemolysis is the breakage of the red blood cells (RBCs) membrane, causing the release of the hemoglobin and other internal components into the surrounding fluid. Hemolysis is visually detected by showing a pink to red tinge in serum or plasma. Hemolysis can occur from two sources: In-vivo hemolysis may be due to pathological conditions, such as autoimmune hemolytic anemia or transfusion reaction. In-vitro hemolysis may be due to improper specimen collection, specimen processing, or specimen transport [1].

In all eukaryotic organisms, containing humankind, production of reactive oxygen species (ROS) is balanced by antioxidant defence system [2]. The antioxidant defence system plays an important role in avoiding chronic diseases by reducing the oxidative damage caused by ROS [3]. Medicinal plants which show powerful antioxidant activity, may be used as a safe source in industrial crops and products.

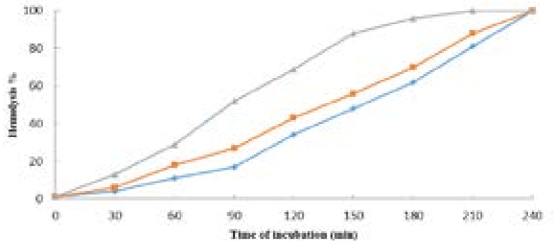

Figure 1: Time (min) dependent rate of H_2O_2 induced hemolysis of red blood cells (RBCs) in the presence of extracts. *Salvia euphratica* (◆), *Salvia candidissima* (■) and *Salvia russellii* (▲)

The protective effect of methanolic extracts on red blood cells (RBCs) hemolysis were utilized by oxidative stress induced experimentally using hydrogen peroxide. Under the given situations, hydrogen peroxide occasioned significant RBCs lysis which was considerably inhibited by plant extracts [4]. Figure 1 is presented that time dependent rate of hydrogen peroxide of (RBCs) hemolysis in the presence of extracts. At the end of 240 minutes, all of plant extracts showed 100% hemolysis. The time required to achieve 50% hemolysis was calculated from the obtained curves. Lower T_{50} reflects better anti-hemolytic effect. Maximum anti-hemolytic effect is shown by S.russellii (87 ± 1.2 min) followed S.candidissima (136 ± 5.3 min) and S.euphratica (154 ± 2.1 min). Ascorbic acid from the positive controls may not show 50% hemolysis end of 240 min. Also, curcumin (139 ± 4.2 min) > BHT (212 ± 3.0 min) ranking was seen for the other positive controls.

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Keywords: Hemolysis, Salvia candidissima, Salvia euphratica, Salvia russellii.

S-E1-003

ANTIMICROBIAL AND ANTIOXIDANT ACTIVITIES OF THE ESSENTIAL OIL AND VARİOUS EXTRACTS OF *THYMBRA SPICATA* AND *OCIMUM BASILICUM* (LAMIACEAE)

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Alternative products in recent years as a result of drug resistance of bacteria to win against synthetic chemicals are possible. The maximum orientation in alternative products is shifting towards natural herbal products. The chemical composition of Thymbra spicata and Ocimum basilicum is expected to be a suitable alternative for these questions.

Thymbra spicata (thyme) and *Ocimum basilicum* (basil) belong with Lamiaceae family is commonly consumed in Amasya. In this study it is aimed that researching for antibacterial effect of this plants' various extract solution and essential oil.

Thymbra spicata (thyme) and *Ocimum basilicum* (basil) is used for material in this work. The plants' essential oil is obtained with water vapor distilation method (Clevenger tool) [1]. The plants (30 g) were refluxed with 100 mL suitable solution (ethanol, dicloromethane, n-hexane) for 2 h. The infusions were filtered and the solvents were removed under rotary vacuum. Then the residue solved in DMSO. Oil and extracts samples were stored at 4 °C in sealed glass vials. Antimicrobial activity is determined with Kirby-Bauer method. *Staphylococcus aureus* ATCC 25923, *Klebsiella pneumoniae* ATCC 700603, *Escherichia coli* ATCC 25922, *Pseudomonas aeruginosa* ATCC 27853, *Bacillus cereus* ATCC 7064, *Proteus vulgarıs* ATCC 13315 are used for the test [2].

It was observed that essential oil of T. spicata have the most effective and significantly activity against E. Coli (35 mm). In addition the ethanolic extract of T. spicata have more effective than the other extracts. This mean that extract of polar solvents is more effective than extract of apolar solvents on the microorganisms. It has shown that essential oil and extracts of O. basilicum also has activity against the bacterias. But this effect is less than essential oil and extracts of T. spicata.

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Keywords: Lamiacae, antibakteriyel etki, disk difüzyon, polarlık

S-E1-004

BIOACTIVITY-GUIDED ISOLATION OF LUTEOLIN-7-O-GLUCOSIDE FROM *TANACETUM ABROTANIFOLIUM* (L.) DRUCE (ASTERACEAE)

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The genus *Tanacetum* L. belongs to Asteraceae family and consists of about 160 species in the world and is represented by 45 species in the flora of Turkey [1]. Many species of this genus have traditionally been used for the treatment of various diseases, including fever, arthritis, vertigo, stomach-ache, migraine, toothache, psoriasis menstrual disorders and insect bites. Many biological activity studies have been reported on the extracts of *Tanacetum* genus exhibit anti-inflammatory, anticancer, antiviral, antifungal, antihelmintic, insecticidal and antiprotozoal effects [2]. As part of our continuing study on the secondary metabolites in medicinal plants, here we report on biological activity and phytochemical investigation of *Tanacetum abrotanifolium* from Turkey. Bioactivity-guided fractionation of the methanol:dichloromethan (1:1; v/v) extract from aerial part of *T. abrotanifolium* has led to the isolation and characterization of luteolin-7-O-glucoside. Chemical structure of the title compound was determined on the basis of extensive spectroscopic (FT-IR, ESI-MS, UV, IR, ^{1}H and ^{13}C NMR, DEPT and 2D NMR including COSY, HSQC and HMBC) data analysis and by comparison with the literature data. The antiproliferative activity of this compound was investigated against cancer cells HeLa (Human Endometrial Cancer Cells) and C6 (Rat Brain Tumor Cells). This isolate showed a significant and dose–response antiproliferative effect against cancer cells at the concentrations of 10, 50 and 100 µg/ml (Figure). The target-compound was also evaluated for its antioxidant activity by using DPPH (2,2-diphenyl-1-picrylhydrazyl) free radical. Luteolin-7-O-glucoside exhibited strong scavenging activity against DPPH free radical (SC_{50} =7.26±1.89 µg/ml) compared with the positive control butylated hydroxyl toluene (BHT) (SC_{50} =21.7±0.25 µg/ml). We concluded that the luteolin-7-O-glucoside was reported for the first time from the *T. abrotanifolium*.

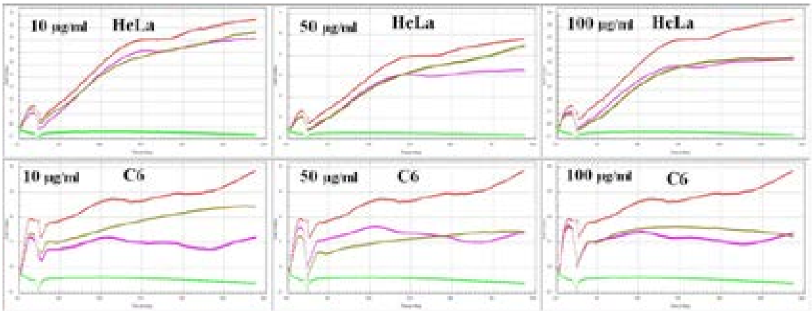

Figure: Anti-proliferative effects of purified compound on HeLa and C6 cells. Proliferation of the cells monitored by Roche [■luteolin-7-O-glucoside ■5-FU ■Ctrl ■Medium].

Acknowledgements**:** I.H Geçibesler would like to express his sincere thanks to Prof. Dr. İbrahim Demirtaş, Department of Chemistry, Science Faculty, Çankırı Karatekin University for his supervisor. Author also thanks PhD. Student Serkan Koldaş for antiproliferative activity studies.

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Keywords: Bioactivity-guided Isolation, Luteolin-7-O-Glucoside,Tanacetum Abrotanifolium, Antioxidant

S-E1-005

SYNTHETIC CARBON NANOTUBE MEMBRANES TO PREDICT SKIN PERMEABILITY OF COMPOUNDS

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In this present study, carbon nanotube (CNT) membranes were prepared to predict skin penetration properties of compounds. A series of penetration experiments using Franz diffusion cells were performed with 16 different membrane compositions for model chemicals. Similar experiments were also carried out with same model molecules using 5 different commercially available synthetic membranes (dialysis, cellophane, tuffryn, strat-m, PVDF membrane) and human skins for comparison. Multi wall carbon nanotubes (MWCNTs) were used to prepare carbon nanotube membranes. To mimic barrier properties of the skin, a variety of lipids such as cholesterol, L-Alpha-Dipalmitoyl phosphatidylcholine (DPPC) and a protein bovine serum albumin (BSA) were added to the CNT membranes. Model chemicals were diclofenac, dexketoprofen, salicylic acid. Ultra high performance liquid chromatography (UPLC) system was used for the analysis. Their permeability coefficients and flux values (Js) were calculated. Correlations between permeability values of model compounds through human skin and developed model membranes were investigated and good correlations were obtained for CNT membrane, isopropyl myristate treated CNT membrane (IM-CNT membrane) and bovine serum albumin-cholesterol, dipalmitoyl phosphatidyl choline treated membrane (BSA-Cholesterol-DPPC-IM-CNT membrane). Thus, the CNT membranes would be good candidate for preliminary evaluation of the permeability of active ingredients across the human skin. As a result, the suitable model membranes were developed for the in vitro penetration experiment which would be also important in the first stage of drug development.

Acknowledgements: This work was supported by the Scientific and Technological Research Council (TUBITAK) grant number 114S133.

Keywords: Carbon nanotube membrane, permeability coefficient, UPLC, dexketoprofen, salicylic acid, diclofenac sodium.

S-E1-006

SYNTHESIS OF METALLOPORPHYRIN BASED PHOTOSENSITIZER USED IN PHOTODYNAMIC THERAPY AND CANCER TREATMENT

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Photodynamic therapy (PDT) is a way to treat cancer by a photosensitizer or photosensitizing agent with light absorbtion. When the photosensitizers are exposed to ligth of suitable wavelength, singlet oxygen ($^1O_2$) or other reactive oxygen species (ROS) are being generated that trigger eventually cell death [1].

Porphyrins are one class of molecules under intense investigation due to their photosensitizing ability for PDT application. Expanded porphyrins result from the expansion of the phi (π) electron conjugation by increasing the number of heterocyclic rings or bridging carbons of the existing porphyrin framework. These chromophores show strong absorptions between 400-800 nm [2].

Except zinc many metals such as copper, iron, molybdenum and cobalt have been studied for the synthesis of metalloporphyrins, however zinc phorphyrins turned out be the best candidate due to their high singlet oxygen quantum yield [3].

In our studies, we have synthesized dual chemotherapeutic drugs by coupling metallo(II)-porphyrin to platinum(II) complexes such as cisplatin and transplatin. These molecules show low toxicity in the dark conditions and high toxicity in presence of light, this provides to obtain high phototoxicity index (PI) [4].

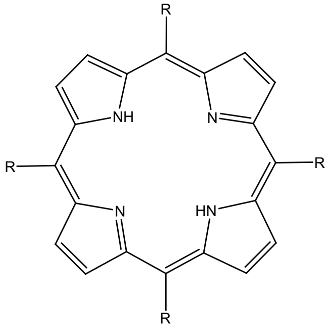

Figure 1: Structure of porphyrin ring

Acknowledgements: I would like to thank to my supervisor, Prof. Dr. Bernhard Spingler, my lab-mate, Michele Larocca and also many thanks to SCS Foundation for the Alfred Werner Fellowship.

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Keywords: Cancer, Photodynamic, Therapy, Porphyrin, Photosensitizer

S-E1-007

DETERMINATION OF QUANTITATIVE STRUCTURE-ACTIVITY RELATIONSHIPS OF DABO DERIVATIVES BY ELECTRON CONFORMATIONAL-GENETIC ALGORITHM METHOD

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In this work, a hybrid 4D-QSAR [1] approach (EC-GA) [2] that combines the electron conformational (EC) and genetic algorithm optimization (GA) [3] methods was applied in order to explain the pharmacophore (Pha) and to predict anti-HIV1 activity by studying 65 compounds in the class of dihydro-alkoxy-benzyl-oxopyrimidines (DABOs) derivatives [4]. For this reason, EMRE V2.0, ECSP and Activity codes have been developed as a 4D-QSAR packet programme.

In the first part of the EC-GA Method, quantum chemical computations and conformational analysis of DABOs are achieved using HF-STO 3G Method in Spartan packet programme. To reveal the pharmacophore group, each conformation of all compounds was arranged by electron conformational matrices of congruity (ECMC) using EMRE V2.0 programme. The ECMC of the most active compound chosen as a template is compared with other ECMCs within given tolerances using ECSP programme in order to find the Pha. The electron conformational submatrix of activity (ECSA) which represents the Pha is identified using ECSP.

432 different molecular descriptors including topological, geometrical, and thermodynamical parameters were prepared and calculated for each conformer of 65 compounds based on the Pha group using EMRE software. Genetic algorithm procedure written in a MATLAB environment and the lsqnonlin function statistics toolbox in MATLAB were employed to search for the best subset of molecular descriptors which mostly contributes to the activity and to calculate the theoretical activity.

The data set of which was partitioned randomly into two training and test sets with ten descriptors showed good statistics both in the regression ($R^2_{training}$=0.805, R^2_{test}=0.743) and cross validation (q^2=0.692) for the training set of 50 compounds and the test set of 15 compounds.

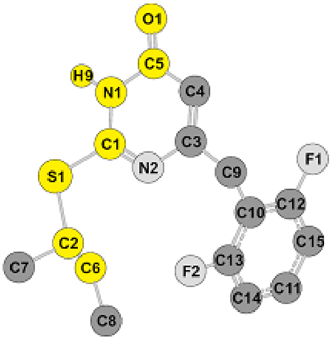

Figure 1: The Pha atoms of the lowest energy conformer of the reference compound

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Keywords: Pharmacophore, DABO, EC-GA Method

S-E1-008

SYNTHESIS, CHARACTERIZATION AND DNA BINDING STUDIES OF NOVEL ZN^{II}PC

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The search of novel drugs that may be associated with nucleic acids provides important information for the development of new therapeutic targets in pharmaceutical design. Binding strategies of small molecules to DNA has practical interests for the design and development of nucleic acid targeting drugs in the search for new drug candidates. Especially, the interaction and reaction of cationic metal complexes with DNA has long been the subject of the biotechnology and medicine. This interaction is based on redox-active complexes (zinc, copper, cobalt, etc.) with high affinity for DNA, capable of oxidizing the C–H bonds of the deoxyribose units that occur as a result of DNA cleavage [1]. It is known that DNA is a molecule with highly negatively charged and it interacts strongly with cationic porphyrins, phthalocyanines, and their analogs [2]. Phthalocyanine (Pc) is a macrocyclic and tetramer molecule with its high chemical and thermal stability. The ease of chemical modifications, Pcs have received renewed attention in various application fields, such as non-linear optics, solar energy, data storage devices, laser dyes, photodynamic cancer therapy, and semi-conductive materials [3]. Although many synthetic compounds have been developed to explore a variety of DNA/RNA structures, few molecules can be used to photocleave DNA in the concept of photodynamic therapy. Porphyrins, Pcs and chlorins are currently being used in photodynamic treatment of tumors due to their large absorption coefficients [4]. The DNA binding studies were used to understand the mechanism of drug action. Cationic Pc molecules have been shown to interact with DNA at the molecular level by specific binding modes. The binding mode of Pc with DNA also depends on the relative concentration of Pc and DNA, the nature of DNA and Pc [5].

In this study, we have reported the synthesis of novel cationic Zn^{II}Pc {2,10,16,24-tetrakis-4-((4-(dimethylamino) phenyl)diazenyl) phthalonitrile)} phthalocyaninatozinc(II) (Fig.1) which has been characterized by IR, ^{1}H-NMR spectroscopy and MALDI-TOF mass spectrometry. The interaction of quaternized Zn^{II}Pc with calf thymus-DNA was investigated by using absorption and fluorescence spectroscopic techniques. The results showed that quaternized-Zn^{II}Pc exhibits efficient DNA-binding activity.

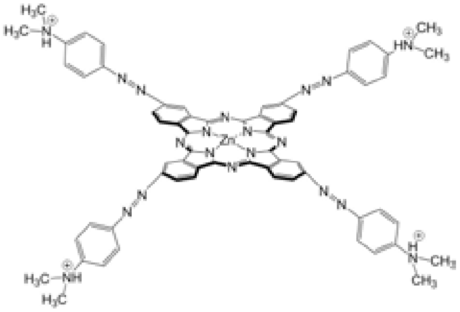

Figure 1: The structure of the synthesized quaternized-Zn^{II}Pc

Acknowledgements: This work was supported by Marmara University, Commission of Scientific Research Project, FEN-A-150513-0169.

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Keywords: DNA binding, phthalocyanine, photodynamic therapy

S-E1-009

EVALUATION OF MUCOADHESION BY A TEXTURE ANALYZER FOR DIFFERENT POLYMERS AND MUCOSAL TISSUES

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Bioadhesive/mucoadhesive polymers are continuously being explored for various drug delivery applications [1]. Mucoadhesive polymers have also been investigated in ocular, nasal, vaginal and buccal delivery of bioactives. Along with polymers having special characteristics like thermosensitive, pH sensitive, enzyme or chemical sensitive polymers, mucoadhesive polymers are extensively being investigated for promising biomedical application which may soon be translated into potential clinical applications [2]. Drug administration via mucosal routes is frequently used for enhancing the local efficacy or bioavailability of systemic drugs. The most crucial parameters in mucosal drug administration are sufficient residence time for the applied dosage in the mucosa, and sufficient time for the adsorption of the drug by these tissues. To achieve this, studies have been conducted to improve the residence time of drugs in the target tissue. In these studies, polymers with different structures have been used to improve the adhesion of the dosage methods which in turn increases their residence time in the mucosa. In this study, we will investigate the mucoadhesive properties of different gels prepared with chitosan, HPMC, carbopol, polycarbophil, and guar gum, on different types of mucosa. The measurements will be performed using a Texture Analyzer to determine the maximal detachment force of the gels from the mucosa and their work of adhesion. Due to its wide surface area bovine mucosa will be used for the model; specifically, cheek, nasal, vagina, uterus, rectum, stomach, esophagus, small intestine and colon mucosa. The mucoadhesion properties of the different polymers on the range of tissues will be established and compared, then the polymer with the highest potential use for any given tissue will be determined.

Acknowledgements: This work was supported by the Scientific and Technological Research Council (TUBITAK) grant number 215S155.

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Keywords: gel, mucoadhesion, mucosal tissues, polymers, texture analyzer

S-E1-010

INVESTIGATION OF ANTIOXIDANT PROPERTIES OF SOME HYDROXYANTHRAQUINONES: A DENSITY FUNCTIONAL THEORY STUDY

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Free radicals are highly reactive compounds formed in the body during biochemical reactions. Because of their reactivity lipids, proteins and DNA can be damaged by the radical action. In consequence, they are responsible for many diseases, such as cancer, cardiovascular disorders, atherosclerosis, asthma, arthritis, diabetes neurodegenerative disorders: Alzheimer`s, Parkinson`s diseases and dementia [1-4]. To protect the cells from the damage caused by free radicals, it is necessary to inhibit or stop the formation of free radicals. Anti-oxidant compounds either natural or synthetic can protect against free-radical-induced damage by scavenging deleterious free radicals and repair the damages caused by free radicals.

Anthraquinones constitute an important class of natural compounds with widespread distribution and a wide range of activity. Substantial amounts of anthraquinones are contained in medicinal plants from two important genera, i.e., *Rheum* in the family Polygalaceae and *Rubia* in the family Rubiaceae [5]. It has been extensively used in traditional Chinese medicine for theirs anti-inflammatory, antioxidant, and antibacterial activities. A wide range of biological and pharmacological activities of anthraquinones, such as antimicrobial, antiviral, anti-inflammatory, anti-cancer, antioxidant, and antifungal [6] depend on their specific functional groups attached at specific positions, particularly for the hydroxyl group. Cai at al. [7] investigated experimentally the antioxidant activity (trolox equivalent antioxidant capacity) of 17 hydroxyanthraquinones (HAQ) in roots of Rheum officinale and Rubia cordifolia using the improved 2,2-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) diammonium salt($ABTS^{\cdot+}$) method. Their findings suggested that the positions of hydroxyl groups and other substituents on one or both sides of the anthraquinone structure significantly affected the radical scavenging activity of the HAQs.

The antioxidant activity of the phenolic antioxidants can be assessed thermodynamically by several physicochemical parameters such as bond dissociation enthalpy (BDE), proton dissociation enthalpy (PDE), proton affinity (PA), ionization potential (IP) and electron transfer enthalpy (ETE). In this study, the structural and electronic properties of the selected HAQs and their radicals were investigated at DFT level. The solvation effects on the antioxidant activity were taken into account by using the conductor–like polarizable continuum model (C-PCM) with different dielectric constants (ε=2.25, C_6H_6; ε= 78.39, H_2O). The three antioxidant action mechanisms, hydrogen atom transfer (HAT), single electron transfer-proton transfer (SET-PT) and sequential proton loss electron transfer (SPLET) were elucidated. The reaction enthalpies related to the steps in these mechanisms were computed in gas phase and solvents. In addition, the highest occupied molecular orbital (HOMO) and the lowest unoccupied molecular orbital (LUMO) distribution and spin density in free radicals were also calculated. The calculated results are in line with experimental values. These calculations may illustrate the SAR and radical scavenging mechanism of HAQs, which may help expand their applications in pharmaceutical and food science.

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Keywords: Antioxidant mechanism, Hydroxyanthraquinones, Radical scavenging, Density functional theory, Antioxidant descriptors

S-E1-011

HALOGEN ATOM EFFECT ON AMPHIPHILIC PORPHYRINS DESIGNED FOR PDT

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For photodynamic therapy, important properties for a photosensitiser are a good ability to generate singlet oxygen generation upon irradiation, and good cell penetration thanks to an appropriate amphiphilicity. Thanks to their structural tailorability and photoproperties, porphyrins are particularly suitable. A traditional strategy for increasing the singlet oxygen generation is based on the heavy atom effect. Halogen atoms can be introduced onto the porphyrin core [1]. Amphiphilicity can be adjusted by designing asymmetrically substituted structures.

In these studies, asymmetrically substituted *meso*-tetraphenylporphyrins of A3B-type have been designed to combine the optimization of the two properties mentioned above. Three phenyl units are substituted by hydroxyls [2] or polyethylene glycol chains, whereas the fourth phenyl unit bears halogen atom, or vice-versa [3]. The influence of the nature of the halogen on singlet oxygen generation and partition coefficient will be discussed with a structure-relationship approach. All these desired effects have been evaluated by the measurements of the photophysical and photochemical properties of the molecules. The amphiphilicity of the compounds have been quantified by their coefficient partition.

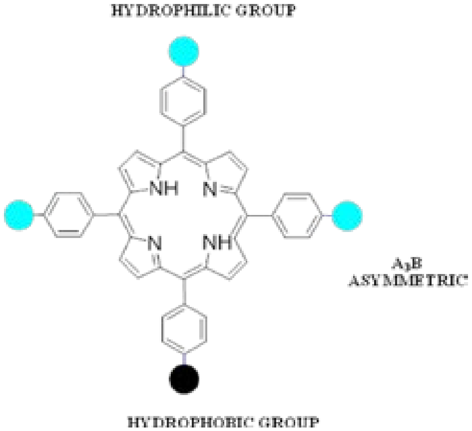

Figure 1: Design of A3B-type Asymetric Porphyrine Derivatives

Acknowledgements: The financial support from the Scientific and Technological Research Council of Turkey TUBITAK (project 114Z090) is gratefully acknowledged.

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Keywords: pdt, asymetric porphyrine, heavy atom effect

S-E1-012

INHIBITION OF HUMAN MONOAMINE OXIDASE BY C3- AND C4-SUBSTITUTED PHTHALONITRILES

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Monoamine oxidase A and B (MAO-A and -B) are flavin adenine dinucleotide-containing enzymes and play essential roles in the oxidation of variety of monoamine neurotransmitters such as serotonin, norepinephrine, and dopamine in the brain and peripheral tissues [1]. Due to their role in the metabolism of monoamine neurotransmitters, MAO-A and MAO-B are considered to be considered to be useful drug targets and associated with neurodegenerative and neuropsychiatric disorders such as Parkinson's disease and depression [2]. While MAO-A inhibitors are used in the treatment of anxiety disorder and depressive illness, MAO-B inhibitors are employed in the treatment of Parkinson's disease [3]. Therefore, finding novel specific inhibitors of these enzymes may be proved useful in the treatment of these disorders.

Phthalonitrile consists of a phenyl ring containing two adjacent nitrile groups with a formula $C_6H_4(CN)_2$. It was recently reported that C4- and C5-substituted phthalonitriles are remarkably potent reversible inhibitors of recombinant human MAO-B [1,2].

To examine the potential role of the position of electron donor and acceptor groups on the phenol ring a series of novel C3- and C4-substituted phthalonitriles were synthesized and examined for the first time as inhibitors of both MAO-A and MAO-B by using *p*-tyramine as substrate. Potency of phthalonitrile derivatives is also compared with the known potent MAO-A and MAO-B inhibitors in a dose-dependent manner. Kinetic inhibition parameters, reversibility and type of inhibition of the most potent inhibitors were also determined.

Our studies demonstrated that substitutions on the phenyl ring of the phthalonitrile azo phenyl derivatives greatly affect selectivity of the compounds, 3-((3,4-cyanophenyl)diazenyl)-[1-1'-biphenyl]-4-yl acetate being the most selective and potent MAO-B inhibitor. Based on these findings, phthalonitrile azo phenyls represent a new promising scaffold to discover potent MAO-A and MAO-B inhibitors.

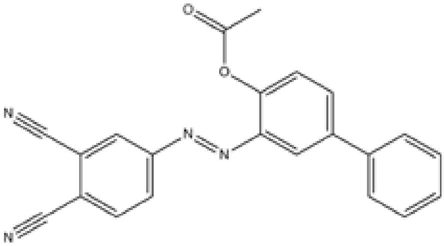

Figure 1. Structure of the most selective MAO-B inhibitor (Selectivity Index:186,5, IC_{50}forMAO-B:0.73 µM).

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Keywords: Parkinson's Disease, Alzheimer's Disease, Monoamine Oxidase, Inhibition, Phthalonitrile

S-E1-013

MICELLAR DRUG DELIVERY SYSTEMS

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Chemotherapy agents, which are the forefront tools to fight against cancer, are extensively toxic to the whole body. These conventional cancer treatment drugs attack cancer cells as well as healthy cells, leaving the patient vulnerable to other diseases. A common solution to this problem is to package the chemotherapy agent in a manner to protect the agent from the body and the body from the agent till it reaches its destination: the tumor. The packaging, nanomaterial based drug delivery systems, that will be explained in this talk are micellar constructs to carry hydrophobic chemotherapy agents. There will be two type of micellar carriers that will highlighted and compared during the presentation. The first micellar delivery system is prepared using triblock dendron–linear polymer conjugate where a hydrophilic linear polyethylene glycol (PEG) chain is attached to a well-defined hydrophobic biodegradable polyester dendron [1]. High concentration of this triblock copolymer in aqueous media leads to gelation [2]. These hydrogel materials have also been extensively studied as functional materials with biological applications [3]. Dendron generation variation is exploited to obtain a library of constructs where the generation has an effect on the size and drug loading of the micelle. The anti-angiogenic drug is covalently bound to the construct, aiding the micelle formation [4]. The second set of micelles are prepared from diblock copolymers where the hydrophobic block is common with the triblock micelles. Both set of micellar constructs are fully characterized with dynamic light scattering, size exclusion chromatography, UV-vis, Maldi-tof and evaluated for their drug release profiles, stability, in vitro cytotoxicities and cell internalization.

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Keywords: drug delivery, medicinal chemistry, organic synthesis

S-E1-014

EFFECTS OF ACYL HOMOSERINE LACTONE ANALOGS DESIGNED AS QUORUM SENSING INHIBITORS ON THE PRODUCTION OF *PSEUDOMONAS AERUGINOSA* VIRULENCE FACTORS

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Misuse or large-scale use of antibiotics in pharmacotherapy has led to the development of widespread resistance to these agents and poses significant health threat.The increasing occurrence of multiple antibiotic resistance in pathogenic bacteria has gradually made conventional antimicrobial treatment ineffective. Identification of alternative antimicrobial drug targets and development of novel treatment strategies are urgently needed [1]. One such new strategy is the disruption of bacterial quorum sensing(QS) system. QS is a cell-to-cell communication system employed by a variety of bacteria to co-ordinate group behaviors as function of cell-density. QS depends on the production of N-acylated-L-homoserine lactone (AHL) signal molecules. AHLs diffuse from bacterial cells and accumulate in the medium. The accumulated AHLs interact with a transcriptional activator protein then induce the expression of QS-regulated genes [2].

Pseudomonas aeruginosa is an important opportunistic human pathogen. *P. aeruginosa* possess two major QS system. These QS systems are required for the production of virulence factors such as elastase, exotoxinA, rhamnolipids, pyocyanin, pyoverdin and biofilm formation which all are crucial for the *P. aeruginosa* to cause infection. It has been observed that inhibiting the QS system of a pathogen can result in a significant decrease in virulence factor production and biofilm formation. Therefore, inhibition of bacterial QS systems offers a novel way to fight with multi-antibiotic-resistant bacteria. In this study, 16 AHL analogues that compete with receptor protein to prevent signal perception were synthesized by microwave assisted methods. The structures of these compounds were confirmed by NMR, IR and elemental analysis. Quorum sensing inhibitor selector (QSIS) assay using biomonitor strain was employed to determine efficacies of AHL analogues as QS inhibitor. These compounds were also assessed for their capacities to prevent production of QS-regulated virulence factors such as elastase, pyocyanin and biofilm formation in *P. aeruginosa* PA01 strain. 11 out of 16 compunds were found to have anti-QS activities against biosensor bacteria (QSIS1). These compounds were also found to significantly affect QS regulated elastase and pyocyanin production and biofilm formation in *P. aeruginosa* PA01 strain. These results of this study suggest that AHL analogues may provide a starting point for the design and development of new QS inhibitory drugs that restrict virulence of clinically important human pathogens.

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Keywords: pseudomonas aeruginosa, quorum sensing, cell-to-cell communication, AHL, virulence factor, antibiotics

S-E1-016

SYNTHESIS OF 2-AMINO-3-[(2-NITRO-1-PHENYLPROPYL)THIO] PROPANOIC ACID DERIVATIVES AND STRUCTURE ELUCIDATION

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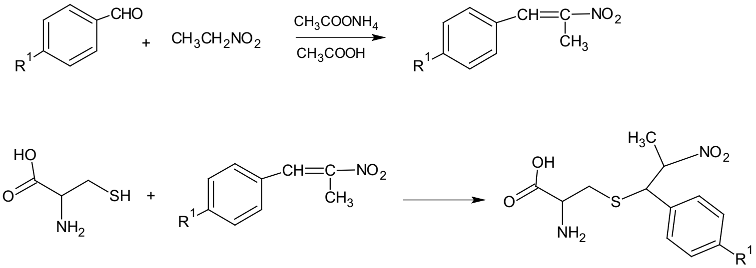
β-Methyl-β-nitrostyrenes are known for their various pharmacological activities. Particularly antibacterial, antifungal, antineoplastic, antiseptic, antiplatelet and antituberculer activity [1]. Furthermore, the addition products with a nitrostyrene moiety have been recognized to have diverse biological activities, especially antimicrobial and anticancer effects [2]. Cysteine, which is a sulfur-containing amino acid and an important structural and functional component of proteins and enzymes. Thiol group of cystein is also nucleophilic and thus can undergo addition and substitution reactions [3].



Scheme 1: Synthesis of 2-amino-3-[(2-nitro-1-phenylpropyl)thio]propanoic acid Derivatives

Michael type addition reaction of β-Methyl-β-nitrostyrenes with various aromatic and aliphatic thiol group have been investigated by our research group [4-5]. β-Methyl-β-nitrostyrene derivatives were synthesized according to literature methods using corresponding benzaldehyde derivatives and nitromethane in the presence of base [6]. The addition products of β-Methyl-β-nitrostyrene derivatives with cysteine were obtained by Michael-type addition reaction. Structures of synthesized compounds were elucidated by ^{1}H NMR, elemental analysis and mass spectra.

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Keywords: nitrostrene, cysteine, michael adducts

S-E1-017

SYNTHESIS AND BIOLOGICAL EVALUATION OF SOME FLUORO- SUBSTITUTED CHALCONES

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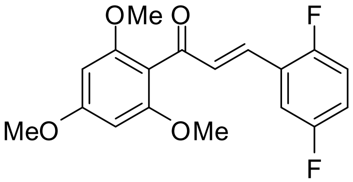
Chalcones, one of the major classes of natural products, are open-chain flavanoids in which two aromatic rings are linked by a three carbon α,β–unsaturated/saturated carbonyl system.[1] Chalcone derivatives attract much attention as drug candidates because of their wide-ranging biological activities as well as their accessibility from the appropriate benzaldehyde and acetophenone derivatives. Chalcones show many biological activities such as anti-diabetic, anti-neoplastic, anti-hypertensive, anti-retroviral, anti-inflammatory, anti-histaminic, anti-oxidant, anti-malarial and anti-cancer.[2]

Fluorine-containing compounds have been widely researched in the literature for their use as drugs or drug candidates.[3] Fluorine as a substituent affects the bonding interactions and metabolic stabilities of drugs and has an impact on their physical features and selective reactivities. The introduction of fluorine or fluorine containing group to a molecule significantly changes its features.[4]

In this study flouro-substituted chalcone derivatives were synthesized with 80-95% yield and their effects on cancer cell proliferation were assessed *in vitro* using human lung adenocarcinoma epithelial cells (A549), human renal cancer cells (A498), human cervical cancer cells (HeLa), human skin malignant melanoma cells (A375), and human hepatocellular carcinoma cells (HepG2).[2]



0.030 µM A498 cancer cell line

Acknowledgements: This study was supported by TÜBİTAK (114Z554) and Erzincan University.

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Keywords: Chalcones, anticancer activity, IC50, cytotoxicity

S-E1-018

CHEMICAL CONSTITUENTS AND ANTIPROLIFERATIVE ACTIVITIES OF *SANTOLINA CHAMAECYPARISSUS*

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Cancer is a major disease worldwide. Plants synthesize a huge amount of metabolites. Studies about new herbal extracts have attracted researchers' interest and natural products were studied widely in last decades to discover new drugs. In this study the components extracted from *Santolina chamaecyparissus* and the anticancer effects of these components investigated against to HeLa (human cervical cancer) cell lines.

The plant (*Santolina chamaecyparissus*) materials have been gathered from their natural environments in Algeria. They were dried at suitable conditions and components extracted with suitable organic eluents[1-3]. Anticancer activities of herbal extracts against to HeLa (human cervical cancer) cells were searched with xCELLigence Real Time Cell Analyzer SP System (Acea Biosciences, Inc.) [3,4]. The system based on the measurement of the impedance differences caused by the cells attached to the micro electrodes at bottom of E-Plate 96 [5]. The extracts exhibited higher antiproliferative activities (at 250, 100 and 50 µM). Fraction 7 showed the highest activity against to HeLa cells as seen in Figure 1.

The extracts of *Santolina chamaecyparissus* may be considered as a potential source of a natural anticancer agent in pharmacy. This study supports *Santolina chamaecyparissus* includes some antiproliferative components. These components must be examined against other cancer cell lines.

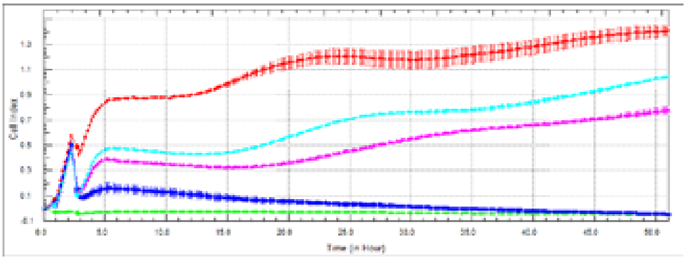

Figure 1: The antiproliferative activity of the active fraction 7 against to HeLa.

Acknowledgements: The author thanks to Research Fund of Cankiri Karatekin University (BAP-FF28015B13) and Dalila Messaoudi.

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Keywords: anticancer, chromatography, HeLa, *Santolina chamaecyparissu*

S-E1-019

STRUCTURE-ACTIVITY RELATIONSHIP OF SOME 4-AMINOANTIPYRINE COMPOUNDS: EVALUATION OF THE SUBSTITUENT EFFECT ON CYTOTOXIC AND APOPTOTIC ACTIVITIES

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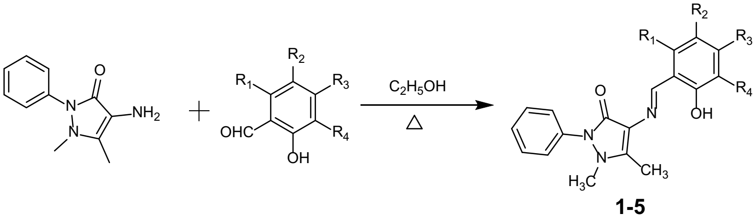
Schiff bases and their corresponding metal complexes have received great attention since the discovery of their effectiveness at inhibiting proliferation of cancer cells [1-3]. A variety of compounds such as antipyrines, amino thiazoles, amino sugars, amino acids, aromatic aldehydes, triazole, and thiosemicarbazides have been employed to synthesize these pharmacologically important compounds. Among them, antipyrine derivatives are of particular importance as antipyrine has a very useful pharmacological pyrazolone nucleus. Being one of the best known antipyrine derivatives, 4-Aminoantipyrine (4-AAP) shows protective and prophylactic effects against oxidative stress and some diseases such as cancer [4]. As part of the continuous interest and need for new potential bioactive compounds, many embarked on the synthesis of 4-AAP derivatives due to their potential biological activities. Five 4-aminoantipyrine (4-AAP) based Schiff bases (**1**-**5**) were synthesized from 4-AAP and different salicylaldehyde derivatives bearing substituents of different polarity at different positions in order to investigate their structure-activity relationships by evaluating their cytotoxic and apoptotic activities. Cytotoxic activities of **1**-**5** were examined against human colorectal (DLD-1) and endometrial (ECC-1) cancer cells and non-cancerous HEK293 cells. Compound exposure caused a reduction in cell viability for DLD-1 and ECC-1 in a dose dependent fashion while no toxicity was observed in normal HEK293 cells. Compounds **4** and **5** both have *tert*-butyl groups and showed the highest cytotoxic activities. The results showed that incorporation of *tert*-butyl groups, which increase the lipophilicity and permeability of the molecule through the cell membrane, enhanced the cytotoxicity of 4-AAP compounds against the tested cancerous cells while not impairing the healthy cells. Moreover, Acridine Orange/Ethidium Bromide (AO/EB) staining study suggested that cell death might have occurred through apoptotic mechanism.



1-5

Compound	R_1	R_2	R_3	R_4
1	H	H	OCH_3	H
2	H	Br	H	OCH_3
3	Br	H	H	OCH_3
4	H	H	H	*t*-Bu
5	H	*t*-Bu	H	*t*-Bu

Figure 1: Synthetic route to 4-AAP Schiff bases **1-5**

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Keywords: Structure-activity, Cytotoxicity, 4-AAP, Apoptosis, Lipophilicity

S-E1-020

IN VITRO CYTOTOXICITY PERSPECTIVE OF TAMIFLU

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İnfluenza is a contagious respiratory infection caused by a variety of influenza viruses. Neuraminidase inhibitors is a new class of antiviral drugs that inhibit influenza A and B viruses [1]. One of the most popular antiviral agents is Oseltamivir, having a commercial name of Tamiflu, within anti-influenza antivirals. As well as Tamiflu is a member of neuraminidase inhibitor group drug [2]. This study was performed to determine the effect of Tamiflu on cultured human peripheral blood lymphocytes by using worldwide well recognized the genotoxicity and cytotoxic assays.

For examining, the presence of the indirect mutagenic effect of oseltamivir in S9 mix was used. S9 mix containing rat liver S9 fraction which was prepared according the Garner's methods, NADPH2,NADP-Na2, glucose-6-phosphate ,Mg-aspartate, phosphate buffer at pH 7.4 and KCl [3]. Cells were treated with 0.5, 1 and 2 µg/mL oseltamivir, the Tamiflu capsule ingredient, for 24 or 48 h in the absence or presence of an exogenous metabolic activation system (S9 mix). Sitotoxicity was calculated with proliferation index (PI), mitotic index (MI) and nuclear division index.

Tamiflu, compared to control and solvent control cultures treated with exogenous metabolic activator has not decreased significantly in the cytotoxicity.

In this study, the cytotoxic effects of Tamiflu, an antiviral drug belonging to the neuraminidase inhibitor group were evaluated. The drug is known as a good solution for therapy of influenza infection. DNA replication happening in the effect on proliferation index (PI), the effect on mitosis of mitotic index (mi) and the effect on the core index division of the nucleus. 0.5, 1 and 2 µg/ml concentration of Tamiflu in three hours and solvent control values in the control that results from the application PI the value of PI is similar.

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Keywords: Tamiflu, Oseltamivir, Cytotoxicity

S-E2-001

SYTHESIS OF 1,3-TRIAZENE DERIVATIVES OF SULFONAMIDES AND TESTING OF THEIR CARBONIC ANHYDRASE INHIBITION PROPERTIES AGAINST CANCER RELATED ISOZYMES

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Carbonic anhydrase is a zinc enzyme responsible for the reversible hydration of carbon dioxide to bicarbonate, being involved in respiration and CO_2 transport between the metabolizing tissues and the lungs, pH and carbon dioxide homeostasis, electrolyte secretion, biosynthetic reactions, etc. In mammals 16 isozymes have been described to date, with different catalytic activity, sub-cellular localization, and tissue distribution.

Carbonic anhydrase inhibitors were exploited for more than five decades in the treatment of edema, glaucoma, obesity, cancer, epilepsy and osteoporosis. Of recent interest is the development of selective inhibitors against membrane-bound isozymes, which will leave untouched the cytosolic ones, thus reducing the side effects associated with existing drugs on the market.

A series of 15, 1,3-triazene benzenesulfonamides were synthesized from diazonium salts of sulfanilamide and a small library of amines. The synthesis was optimized in terms of conversion and yield, and characterized by standard methods (^{1}H-NMR, ^{13}C-NMR, LC-MS, Elemental Analysis and Melting points). Also, the 1,3-triazene benzene sulfonamides proved to have a very good inhibition profile against various physiologically-relevant isozymes.

We have constructed a small library of 1,3-triazene benzene sulfonamides as efficient low-molecular weight selective inhibitors of membrane-bound carbonic anhydrase isozymes. We have also established detailed structure-activity relationships, revealing the best substitution pattern for nanomolar potency against various CA isozymes.

Keywords: Carbonic anhydrase, Isozyme, Triazene, Cancer

S-E2-002

INVESTIGATION OF *Convallaria Majalis*'s FLOWERS DESING OF PERFUME USAGE WITH OTHER FLOWERS USAGE

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Perfume word is defined as "fragrance" and "bottled fragrance" in dictionary of Turkish Language Institution.

Perfume is obtained from scented oils, aromatic mixture and various chemicals. It is used to provide fragrance to human body, various objects and environments. Perfume is one of the areas experiencing the biggest battle of competition and prestige in cosmetics industry. There are two parts in the perfume content. These parts are aromatic essential oils and solvents. There is no odor of each molecule in nature. But the molecules of perfume must be light enough to remain suspended in the air and fragrant. These fragrances create a perception in our brains and they activated different centers. Notes in perfumery are descriptors of scents that can be sensed upon the application of a perfume. Notes are separated into three classes; top/head notes, middle/heart notes, and base notes; which denote groups of scents which can be sensed with respect to the time after the application of a perfume. These notes are created carefully with knowledge of the evaporation process and intended use of the perfume. The presence of one note may alter the perception of another - for instance, the presence of certain base or heart notes will alter the scent perceived when the top notes are strongest, and likewise the scent of base notes in the dry-down will often be altered depending on the smells of the heart notes. In short, perfume is developed by Chemical Science using fragrance. It is intuitive and artistic combination.

There is no academic work on the subject in our country. At the same time there is no Turkish brand which competes with companies in the world cosmetics market.

In this study, *Convallaria majalis* flowers which is grown up in Muğla picked up and volatile and flavor compounds were investigated. Essential oil of *Convallaria majalis* flowers was combined with essential oil of other flowers based on the note concept and new perfume combinations was tested. In the next step we intend to convert to a commercial product suitable combination which obtained from this study after the trademark and patent work.

As a result, essential oil components of *Convallaria majalis* flowers analyzed determine the content. Also essential oils of Freesia, violet, pink / purple hyacinths, primroses, daffodils, roses, mimosa, orchid, sandalwood/cedar and sweetgum tree were obtained using steam distillation and extraction. Later trials were made in line with the concept note and it was determined to especially pink hyacinth was very compatible with *Convallaria majalis.*

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Keywords: Convallaria Majalis, perfume, volatile compounds

S-E3-001

ALTERATION OF BOVINE LIVER CATALASE ACTIVITY BY LAMBDA CYHALOTHRIN AND FENTHION INSECTICIDES

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Catalase from bovine liver (CAT) (E.C.1.11.1.6.) decomposes hydrogen peroxide to water and oxygen [1]. To avoid hydrogen peroxide damage to cells, catalase is often used by cells for decomposition of hydrogen peroxide to water and oxygen [2]. Lambda-cyhalothrin is a pyrethroid insecticide. Pyrethroids have been widely used to control insect pests in agriculture and public health since the 1970s [3]. Fenthion is an organophosphate insecticide used in both agricultural and urban areas throughout the world [4]. In this study, 25, 50, 100, 250 and 500 ppm concentrations of lambda cyhalothrin and fenthion pesticides inhibited CAT activity. At the effect of 25, 50, 100, 250 and 500 ppm lambda cyhalothrin, % CAT enzyme activity declines were calculated as 3.4; 11.7; 12.7; 21.2 and 22.5%, respectively. At the effect of 25, 50, 100, 250 and 500 ppm fenthion, % CAT enzyme activity declines were calculated as 4.6; 6.2; 6.7; 17.1 and 19.9%, respectively. CAT inhibited by lambda cyhalothrin as non-competitively and CAT inhibited by fenthion as competitively.

Acknowledgements: This work was supported by the Research Foundation of Adiyaman University, Project Number: FEFYL/2013-0010.

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Keywords: Catalase, Inhibition, Insecticide, Lambda Cyhalothrin and Fenthion

S-E3-002

ADVANTAGES OF AQUEOUS TWO PHASE PARTITIONING (ATPP) FOR BIOMOLECULES AND PARTITIONING OF CATALASE BY ATPP

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Catalase (hydrogen peroxide oxidoreductase; EC.1.11.1.6) is an antioxidant enzyme, capable of protecting the cells from the toxic effect of hydrogen peroxide by catalyzing it's into molecular oxygen and water without production of free radicals. Catalase one of the most common enzymes in plant and animal tissues and has many industrial applications like food, textile and pharmaceutical industry and biosensor systems [1-3]. Conventional chromatographic techniques for purification of biomolecules are time-consuming and difficult to scale up, require some expensive reagents and devices, thus contributing to raise the cost of downstream processing, and increase macromolecular unfolding, leading to biological activity loss [4]. Aqueous two phase system (ATPP) is an alternative method for separation and recovery of biomolecules with minimum number of steps and thus reduces the overall cost. This extraction method consists of two water-soluble polymers (e.g Polyethylene glycol/Dextran) or a polymer and a salt (e.g Polyethylene glycol/phosphate, sulphate, citrate, etc.) and useful for biotechnological application such as separation and purification of proteins, enzymes, nucleic acids, virus, antibodies and cell organelles [5]. In this study catalase was purified and recovered directly from the crude extract of callus of *A. orientalis* by PEG/phosphate ATPP. In this study isolation of catalase from plant was carried out by an attractive system useful for the separation of biological molecules, an aqueous two-phase system, was used. To obtain the highest recovery and purification of enzyme, type of phase-forming salts, (PEG) mass, with their different concentrations, pH and temperature effect on partitioning were investigated. The PEG4000 (12.5%, g/g); Na_2SO_4(12%, g/g), pH 6 and room temperature system was found to be ideal for partitioning catalase into the bottom salt-rich phase. 8.67 purification fold with the recovered activity of 197% was observed. Molecular weight of catalase was measured as 75 kDa.

Acknowledgements: This work was supported by The Scientific and Technological Research Council of Turkey (TÜBİTAK) under Grant (Number 113Z609)

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Keywords: Partitioning, catalase, aqueous two phase

S-E3-003

THERMAL-UNFOLDING STUDIES OF *GEOBACILLUS KAUSTOPHILUS* LIPASE BY CIRCULAR DICHROISM SPECTROSCOPY

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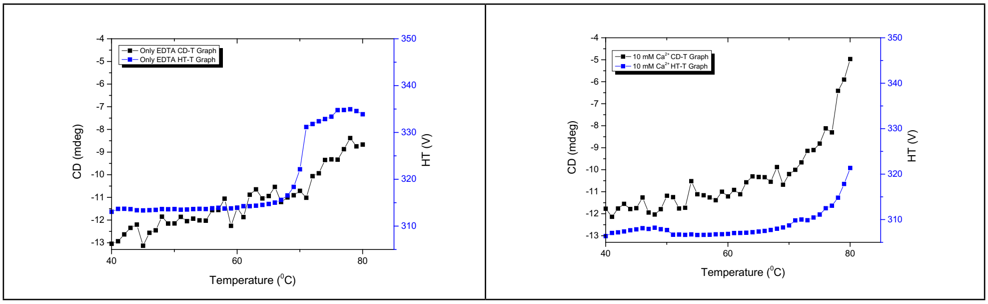
Lipases constitute the most important group of biocatalysts for biotechnological applications [1]. They are used in baking, laundry detergents, organic synthesis and even as biocatalysts in alternative energy strategies to convert vegetable oil into fuel. Those from thermal microorganisms are of particular interest due to their stability at high temperatures [1-2]. *G. kaustophilus* lipase is a thermoalkalophilic enzyme belonging to I.5 family lipases. The crystal structures of three I.5 member lipases have been solved by X-ray studies which revealed that they have calcium- and zinc-binding sites [3-4]. Understanding the structural stability and the function of proteins at different temperatures and conditions provides useful insights in designing proteins with improved stability. Here we have carried out thermal-unfolding studies of recombinant *G. kaustophilus* lipase in the presence and absence of calcium by circular dichroism (CD) spectroscopy. Thermal denaturation studies revealed that in the presence of calcium lipase denatures at about 78 ^{0}C and form insoluble aggregates (Figure 1). Whereas in the absence of calcium (i.e., presence of 1 mM EDTA alone) it maintains most of its secondary structures and form soluble aggregates as monitored by dynode voltage (HT(V)); a clear isobestic point at about 205 nm was observed, indicating reversible two-state unfolding transition (Figure 1). Overall our results show that different unfolding and aggregation pathways take place for *G. kaustophilus* lipase in the presence and absence of calcium and that residues in calcium-binding site are involved in the formation of soluble aggregates.



(A) **(B)**

Figure 1: Thermal denaturation curves and correponding HT data of *G. kaustophilus* lipase in the absence (A) and presence of Ca^{2+} (B)

Acknowledgements: We thank the Research Foundation of Gebze Technical University, Kocaeli-Turkey (BAP 2015/A06) for its financial support.

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Keywords: Geobacillus kaustophilus, lipase, stability, circular dichroism

S-E3-004

FLUORESCENCE STUDY ON THE INTERACTION OF BOVINE SERUM ALBUMIN WITH FLORETIN IN PHOSPHATE-BUFFERED

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The fluorescence quenching is an appropriate technique that is used for investigating the interaction between drug and protein. This technique has been increasingly applied in the studies of serum albumin-flavonoid binding interaction. Bovine serum albumin (BSA)is structural homology which is the same as human serum albümin. Additionally, BSA having a molecular weight of 66 kDA is preferred because of its low cost and high stability[1,2].

In this study, the nature of interaction between Floretin, a kind of flavonoid compound and a wide variety of biological activities such as antioxidant and anti-inflamatuar activities[3], and BSA was investigated using spectroscopic techniques. The analysis of the quenching mechanism was done using Stern-Volmer plots. The results exhibited the presence of a static quenching process between Floretin and BSA. The binding sites, binding constants, and the corresponding thermodynamic parameters of the interaction between Floretin and BSA were also analyzed by utilizing a fluorescence quenching technique. The binding distance between donor (BSA) and acceptor (Floretin) is calculated from the theory of Förster resonance energy transfer. In addition, the binding site to BSA was also estimated using synchronous and 3D fluorescence spectra.

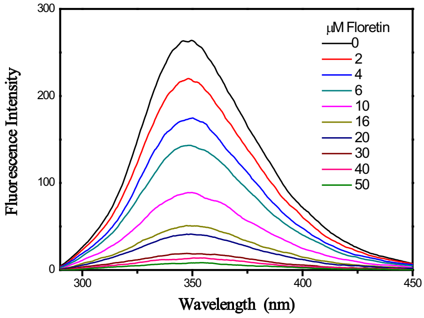

Figure: The fluorescence emission spectra of BSA in the absence and presence of various concentrations of Floretin

Acknowledgement: We are grateful to the Research Fund of Bingol University (Project Number: BÜBAP199-286-2015) for their financial support

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Keywords: Floretin, Quenching, Stern-Volmer, Serum Albumine, Förster

S-E3-005

MS-GUIDED GENOME MINING FOR THE DISCOVERY OF NEW MARINE NATURAL PRODUCTS

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Biotechnological potential of natural products from microorganisms are receiving more attention for discovery of novel bioactive compounds. Terrestrial and marine actinomycetes are an important source for the discovery of novel bioactive compounds. Therefore, a new method genome mining is a good strategy for a natural product discovery.

The obligate marine actinomycete genus *Salinispora* is model microorganism for natural product research. All *Salinispora* strains selected already had whole genome sequence data available and their natural product gene clusters were evaluated with MS guided genome mining. The draft genome sequences of all *Salinispora* strains were analyzed by bioinformatic tools for the MS-guided genome mining. These tools were used to determine the presence of biosynthetic gene clusters such as PKS, NPRS, terpene, indole, lantibiotic, siderophore so on. Molecular networks were generated when extracts of *Salinispora* strains were analyzed via LC/MS/MS. Molecular networking of the data resulted in dereplication of *lomaiviticin* C, 7-OH-*staurosporine, staurosporine* and *cyanosporaside* B. As a result of molecular networking analysis, totally 1347 MS/MS data were compared with one another in the network.

Finally, we determined specific MS/MS and bioinformatic data for *S. pacifica* CNY703, *S. tropica* CNT250 and *S. arenicola* CNY011 and CNY299. Both chemical and bioinformatic data showed that a glycosylated natural product was found in *S. pacifica* CNY703 culture broth and reached NRPS-PKS-I glycosylated natural product gene clusters in *S. pacifica* CNY703 genome.

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Keywords: genome mining, salinispora, natural product

S-E3-006

X-RAY DIFFRACTION AND SEM STUDY OF URINARY STONES IN MERSIN

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Urolithiasis (urinary stone disease) is a common urological sickness caused by multifactorial components such as age, sex, diet, low intake of water, water quality, geographical location and climate. It affects up to 10-20% of the general population worldwide and the recurrence rate is up to 50%[1,2,3]. The chemical compositions of the urinary stones need to be known in order to understand the nature of urolithiasis, its etiology, choosing the correct treatment modality, preventive medical treatment. Currently powder X-ray diffraction (XRD) and Fourier transform infrared spectroscopy (FTIR) are popular devices for the identification of crystalline phases in urinary stones. Scanning electron microscopy (SEM) coupled with energy dispersive X-ray (EDX) are also used to examine the surface morphologies and the chemical compositions of the stones [4,5].

In the present study, the structural and morphological characterizations of seven urinary stones are investigated in Mersin. Also, urinary stones are identified using the XRD (Figure).The sample S1 is phosphate group, S2,S3,S5,S7 is calcium oxalate group, S4 is urate group and S6 is a mixture of calcium oxalate and urate groups. Additionally, SEM coupled with EDX is applied in order to support relation between morphological features and phase compositions of the stone as defined by XRD.

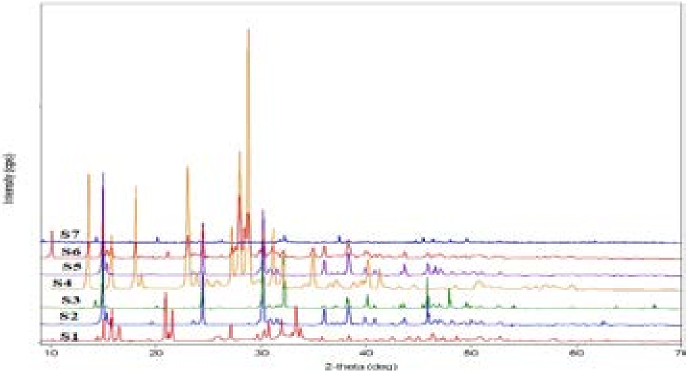

Figure : XRD powder diffraction patterns of S1:Struvite,S2:Whewellite,S3:Whewellite+Weddelite,S4:Uric acid,S5:Whewellite,S6: Uric acid+ Whewellite+ Uric acid dihydrate,S7:Weddellite.

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Keywords: Urolithiasis, Urinary Stones, XRD, SEM.

S-E3-007

DETERMINATION OF EFFECTS OF NONYLPHENOL ON OXIDATIVE STRESS IN PRIMARILY HEPATOCYTE CULTURE IN LAKE VAN FISH

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Environmental pollution, ecosystems and people every day are threatening more. This is also true in Lake Van. Van fish (A*lburnus Tarichi*, Güldenstädt 1814) are also affected by the contaminated lake water. The lake is located in the waste that damage the endocrine system. For this purpose, nonylphenol effect on the antioxidant Van fish were investigated. In this study, Van fish of hepatocyte cell culture was applied in the concentration of 10^{-4}, 10^{-5}, 10^{-6}M nonylphenol. Which is very important Superoxide dismutase (SOD), Catalase (CAT), Glutathione peroxidase (GSH-Px), malondialdehyde (MDA) and 8-hydroxydeoxyguanosine (8-OHdG) levels were determined. Generally nonylphenol implementation period increased, it was observed that increased antioxidant levels. In this study, it was found that generally reaches maximum at 24 hours antioxidants. It showed a significant change in the levels of 8-OHdG. The MDA levels showed an increase in the concentration of 10^{-6}M nonylphenol.

Keywords: Nonilfenol, SOD, GSH-Px, CAT, MDA, 8-OHdG

S-E3-008

A SIMPLE AND SENSITIVE UHPLC METHOD FOR THE DETERMINATION OF OCHRATOXIN-A AND ITS APPLICATION TO BIOLOGICAL SAMPLES

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Ochratoxin-A (OTA) is a mycotoxin which produced by different species of Aspergillus and Penicillium fungi. OTA is known to be harmful to human and animal health due to its nephrotoxic, hepatotoxic, embryotoxic, teratogenic, neurotoxic, immunotoxic, genotoxic and carcinogenic effects [1,2]. OTA is also known to be associated with neurodegenerative diseases, including Parkinson's disease and Alzheimer's disease [3]. Thus, detection of OTA in the cerebrospinal fluid is very important to facilitate a better understanding of the levels of this neurotoxin in the brain.

In this study a simple, sensitive and rapid UHPLC method has been developed and validated for the determination of OTA in the rat cerebrospinal fluid. Six rats were used in the study and a single dose (5 mg kg^{-1} b.w.) of OTA in DMSO was given by intra-peritoneal (i.p.) injection. The microdialysate samples were collected simultaneously after i.p. injection. The samples were collected from lateral ventricule of the rats at every 30 min during a period of 12 h. The UHPLC analysis was performed on a Zorbax Eclipse Plus C8 (150 mm x 3.0 mm ID, 1.8 µm particles) column with acetonitrile:water:phosphoric acid (50:50:0.1, v/v) using the flow rate of 0.6 mL min^{-1}. The fluorescence detector was set at 330 nm excitation and 450 nm emission wavelengths. Diflunisal (DIF) was used as internal standard (IS). OTA and IS were separated within 5 min at these conditions. The method was validated in terms of linearity, precision, accuracy, limit of detection, limit of quantification, robustness, and stability. The intra- and inter-day assay variability was less than 3% for the OTA. Good linearity with a high correlation coefficient was achieved over the concentration range of 0.38-190 ng mL^{-1} for OTA. The amounts of OTA were determined in the mentioned UHPLC conditions in the microdialysate samples.

Acknowledgements: Authors appreciate the support of the Anadolu University Scientific Research Fund (AU-BAP) for the project 1407F345.

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Keywords: UHPLC, mycotoxin, ochratoxin A, microdialysate, rat brain

S-E3-009

THE INVESTIGATION OF THE AMOUNTS OF VITAMIN A, VITAMIN E, βETA-CAROTENE AND LYCOPENE İN SOME RED FRUITS AND DARK RED

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In this study, the amounts of vitamin A, vitamin E, beta-carotene and lycopene in the fruits pericarp and endocarp of the red consumed fruit red with cherry, strawberry, blood orange, red apple, pomegranate, plum, grape fruit, purple berry, red grape, black grape, black berry, watermelon, Viburnumopulus L., red fig, nectarine and peach were determined by using High Performance Liquid Chromatography. The results of vitamin A and vitamin E, beta-carotene and lycopene some fruit for would rather good source can be said. The differences in amount of A and E vitamins, beta-carotene and lycopene in fruits, care of plant, soil composition, may be due to altitude and environmental conditions.

The greatest role of oxidation that threaten in our life in the formation of many diseases. That is why scientifically has been demonstrated that antioxidants is important for our lives because it inhibit oxidation **[1].** Many fruits containing vitamin E, beta-carotene, and lycopene constitute natural sources of antioxidants [**2**]. Therefore, we intended to determine the amount of these parameters in consumed fruits (pericarp and endocarp red fruits) and compared with each other.

In this study, fruits grown in the Elazığ region and commercially available fruits were used. Fruit samples, has been confirmed in the Department of Biology (Botany), Firat University. The amounts of vitamin A, vitamin E, beta-carotene and lycopene were determined according to methods **[3, 4].**

*Table 1.*The amounts of vitamin A, vitamin E, beta-carotene and lycopene obtained from the sample of red and dark red fruits.

Fruits	**Vitamin A (µg/g wet weight)**	**Vitamin E (µg/g wet weight)**	**Beta-carotene (µg/g wet weight)**	**Lycopene (µg/g wet weight)**
Cherry	0.14± 0.011	0.56 ±0,05	16.02 ± 1.63	13.16 ± 2.44
Cherry	0.18± 0.03	0.51 ± 0.04	6.46 ± 0.62	28.28 ± 3.72
Strawberry	0.14±0.02	0.62 ± 0.07	67.93 ± 4.59	37.15 ± 2.16
Blood orange	0,29± 0.04	0.34 ± 0.03	8.78 ± 1.10	0.46 ± 0.06
Red apple	1.16 ±0.12	7.94 ± 1.22	38.45 ± 2.37	23.90 ± 4.03
Pomegranate	0.11± 0.02	0.20± 0.02	21.94 ± 1.45	21.43 ± 2,35
Plum	0.10±0.01	0.19± 0.03	18.78 ± 2.40	41.63 ± 2.64
Grape fruit	1.64 ± 0.14	0.18± 0.02	41.78 ± 6.49	40.24 ± 4.05
Purple berry	0.17±0.01	0.28± 0.03	18.16 ± 3.18	3.30 ± 0.36
Red grape	0.15 ± 0.02	0.11 ± 0.01	5.91 ± 0.82	0.92 ± 0.24
Black grape	0.25 ± 0.04	0.20 ± 0.03	56.88 ± 5.81	50.16 ± 4.92
Black berry	1.46 ± 0.22	6.46 ± 0.64	71.14 ± 6.28	52.19 ± 5.84
Watermelon	0.14 ± 0.012	0.30 ± 0.03	14.49 ± 3.01	13.84 ± 3.41
Viburnumopulus L.	0.22 ± 0.04	8.10 ± 1.04	9.80 ± 1.18	5,84 ± 0.62
Red fig	0.30± 0.05	0.12±0.02	14.45 ± 3.32	0.40 ±0.05
Nectarine	0.13 ±0.02	0.22± 0.03	15.47 ± 2.80	3.34 ± 0.42
Peach	0.11 ±0.02	0.19± 0.03	23.56 ± 3.17	0.72 ± 0.14

It has investigated from the parameters above that the colored red or dark red fruits are very important for nutritional health they are rich in vitamins, beta-carotene and lycopene. Determination of these parameters in the structure of the fruit we believe will contribute knowledge of literature.

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Keywords: Beta-carotene, Lycopene, Red fruits, Vitamin A, Vitamin E.

S-E3-010

DETERMINATION OF THE TRACE ELEMENT LEVELS IN HAIR OF SMOKERS AND NON-SMOKERS BY ICP-MS

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The analysis of human remains is a reliable source of information regarding the dietary habits, environmental surroundings and exposure to toxic elements of a particular population [1]. For at least 50 years, determination of the trace element levels in human hair has been used to assess environmental and vocational exposure to toxic elements [2,3]. As compared to other biological matrices (e.g. blood, urine), human hair is stable and therefore useful as a matrice. Besides that some trace elements are considerably more concentrated in hair than blood or urine that makes analysis easier [3].

In this study hair samples were collected from smokers and non-smokers who live in Diyarbakır, Turkey. Hair samples were washed by a standard procedure proposed by the International Atomic Energy Agency [4]. Then the samples were dried for 16 h at 110°C. Each sample were digested by concentrated nitric acid and hydrogen peroxide in a microwave oven. The digested samples were taken into 50 mL volumetric flasks and filled with deionized water. The trace elements in the samples were determined by using ICP-MS. When the results were evaluated, heavy metal content in the hair of smokers was found to be different from the non-smokers. The precision and accuracy of the method was evaluated by certified reference materials.

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Keywords: Smokers and Non-smokers, Trace Elements, ICP-MS

S-E3-011

SENSITIVE TIME RESOLVED FLOUROIMMUNOASSAY FOR HEMOGLOBIN A1C WITH EU LABEL

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Glycated hemoglobin A1c (HbA1c), is a stable hemoglobin variant formed by a non-enzymatic reactor of glucose with N-terminal valine of hemoglobin, β chain in human body. The percentage of HbA1c reflects the average glucose level over the preceding 2 to 3 months. Thus, HbA1c is considered to be very useful diagnostic marker protein for diabetes mellitus [1-3]. Due to the importance of HbA1c analysis, a number of methods are available, including, ion-exchange high performance liquid chromatography (HPLC), boronate affinity high performance liquid chromatography, enzymatic assays and immunoassays [4]. Time resolved flouroimmunoassay (TR-FIA) using europium complexes as fluorescence labels offers various advantages, such as low background signal, high sensitivity, long fluorescence life times, no radioisotope pollution, easy automation and low matrix effect [5]. There are number of study for determination of various biological materials via TR-FIA technique. TR-FIA has been widely used as an ideal immunoassay method in human diagnostics. However, we herein first report the development of a novel TR-FIA metho using BHHCT-Eu^{+3} complex for the sensitive detection of HbA1c antigen.

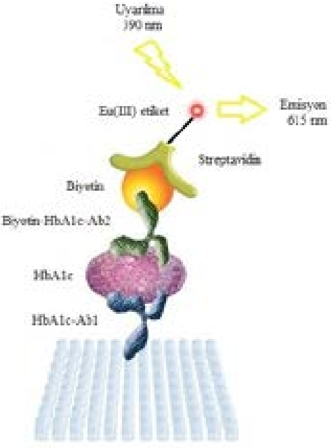

Figure 1: Immunoassay format

The proposed immunoassay was conducted by the typical procedure for sandwich type immunoreactions (Figure1). Primary anti HbA1c antibody was coated on the polystyrene microtiter plates. Human HbA1c antigen was first captured by primary antibody and then sandwiched by a secondary antibody conjugated with the biotin. Finally BHHCT-Eu^{+3} labelled streptavidin was prepared and used for TR-FIA measurement. The concentration of primary and secondary antibody coated on plate and immunoreaction time were optimized. A standard curve for HbA1c was obtained with a linear range between 5 and 25 % HbA1c of total hemoglobin.

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Keywords: Diabetes mellitus, Eu(III) label, Hemoglobin A1c, Time resolved flouroimmunoassay

S-E3-012

CAN BORON BE ACTOR IN DIABETES MELLITUS AND OBESITY?

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Diabetes Mellitus (DM) is a metabolic disorder, which results in disorder of carbohydrate, lipid and protein metabolisms and is caused either by disorder in the effect of insulin or by insulin resistance or absolute or relative insufficiency in secretion of insulin generally caused by genetical and environmental factors[1].

The target of modern treatment of obesity, DM and glucose tolerance is to develop treatment models which would improve the symptoms of these diseases with no or minimum side effects. The goal of this study is to determine the relationship among serum boron levels, obesity and DM in order to investigate the effect of boron on this synergestic interrelation. Hence, blood glucose, insulin and HbA1c and lipid profile (total cholesterol, triglyceride, HDL, LDL), 25(OH)D, Mg, Ca and P levels were determined. This study was carried out with 42 patients in three groups: control, diabetic and the obese diabetic groups. Each group consisted of 14 individuals: 7 male and 7 female subjects. While serum boron, Vitamin D and HDL cholesterol levels were found to be lower than those of the control group, blood glucose, HbA1c, total cholesterol, triglyceride, LDL cholesterol, Ca and P levels were higher than those of the control group. The results showed that boron has positive effect on carbohydrate, lipid and bone metabolisms. Therefore, it is concluded that providing boron support may be beneficial in treatment of diabetic and obese diabetic patients and in diseases related with these sicknesses.

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Keywords: Boron, diabetes, obesity

S-E3-013

INVESTIGATION OF BIOELEMENT LEVELS OF ENDEMIC NEPETA VISCIDA

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Plants are used for medicine, food and cosmetic purposes. Phytochemicals are considered as one of the corner stones of pharmacy from past to the present [1]. *Lamiaceae* family includes many medicinal plant species which are well known and economically important such as sage, pepermint, lemon balm, thyme and oregano, lavander and sweet basil [2]. In our country, Aegean and Mediterranean Region have an important position for endemic species of the family. Turkey has a rich vegetation includes many species of the Lamiaceae family [3]. 14 endemic species of the 33 species of the genus Nepeta are registered in flora of Turkey. *Nepeta viscida* is a kind of perennial herb plant and endemic that grows in Aydin, İzmir, Manisa, Usak [3-4].In this study, it is aimed to determine *Nepeta viscida*'s mineral levels, The plant samples were collected from Banaz/ Usak. Inductively coupled plasma- optical emission spectroscopy (ICP-OES) were used to analyze the following elements. Minerals (measures listed descending with ppm units); Calcium: 9191.7±38.97,Potassium: 1291.82±80.78, Magnesium: 989.798±14.72, Aliminum: 284.207±9.18, Iron:232.284±14.56, Sodium: 226.649±13.45, Manganese:26.651±1.24, Barium:20.096±1.03, Zinc:5.957±1.35, Copper: 3.110±0.27, Bismuth:1.614±0.31, Lead:1.091±0.16, Nickel: 0.766±0.12, Chromium: 0.671±0.14, Gallium:0.5135±0.09, Lithium:0.260±0.02.

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Keywords: Lamiaceae, Mineral Levels, Nepeta viscida, Phytochemicals, Uşak

S-E4-001

SYNTHESIS, OPTIMIZATION AND EVALUATION ON PHOTOTOXIC INDEX OF 3- AND 4-PYRIDYL METALLOPORPHYRINS

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Photodynamic therapy (PDT) is a way to treat cancer by a photosensitizer or photosensitizing agent with light absorbtion. When the photosensitizers are exposed to ligth of suitable wavelength, singlet oxygen ($^1O_2$) or other reactive oxygen species (ROS) are being generated that trigger eventually cell death [1].

Porphyrins are one class of molecules under intense investigation due to their photosensitizing ability for PDT application. Expanded porphyrins result from the expansion of the phi (π) electron conjugation by increasing the number of heterocyclic rings or bridging carbons of the existing porphyrin framework. These chromophores show strong absorptions between 400-800 nm [2].

In this study, we have synthesized zinc and copper based metallo(II)-phorphyrins which are as dual chemotherapeutic drugs by coupling metallo(II)-porphyrin to platinum(II) complexes such as cisplatin and transplatin. These molecules show low toxicity in the dark conditions and high toxicity in presence of light, this provides to obtain high phototoxicity index (PI) [3,4,5,6].

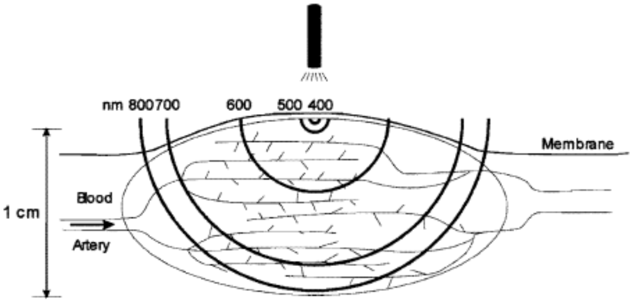

Figure 1: The wavelength of on tumor cell

Acknowledgements: I would like to thank to my supervisor, Prof. Dr. Bernhard Spingler, my lab-mate, Michele Larocca and also many thanks to SCS Foundation for the Alfred Werner Fellowship.

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Keywords: Porphyrin, Photodynamic, Oxygen, Platinum, Cisplatin, Transplatin

S-E4-002

DNA ADSORPTION VIA CO(II) IMMOBILIZED CRYOGELS

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The separation and purification of an important biomolecule deoxyribonucleic acid (DNA) molecules are also extremely important [1-6]. The adsorption technique among these methods is highly preferred as the adsorbent cryogels are pretty much used due to large pores and the associated flow channels they have. In this study, the adsorption of DNA via Co(II) immobilized poly(2-hydroxyethyl methacrylate-glycidyl methacrylate) [poly (HEMA-GMA)] cryogels was performed under varying conditions of pH, interaction time, initial DNA concentration, temperature, and ionic strength. For the characterization of cryogels; swelling test, Fourier transform infrared (FT-IR) spectroscopy, scanning electron microscopy (SEM), surface area (BET), elemental and ICP-OES analysis were performed. L-lysine amino acid was chosen as Co(II)-chelating agent and the adsorption capacity of cryogels was determined as 33.81 mg DNA/g cryogel. Adsorption of pea DNA was studied under the optimum adsorption conditions and DNA adsorption capacity of cryogels was found as 10.14 mg DNA/g cryogel. The adsorption process was examined via Langmuir and Freundlich isotherm models and the Langmuir adsorption model was determined to be more appropriate for the DNA adsorption onto cryogels.

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Keywords: Adsorption, Co(II), Cryogel, DNA

S-E4-004

A NEW AND EFFICIENT SYNTHESIS OF 1-BENZYL-5-HYDROXY-7,7-DIMETHYL-6,7-DIHYDRO-1*H*-INDOL-4(5*H*)-ONE USING CHEMOENZYMATIC METHODS AND THE EFFICIENT SYNTHESIS OF 5-HYDROXY-7,7-DIMETHYL-6,7-DIHYDRO-1H-INDOL-4-(5*H*)-ONE USING BIOTRANSFORMATION REACTION

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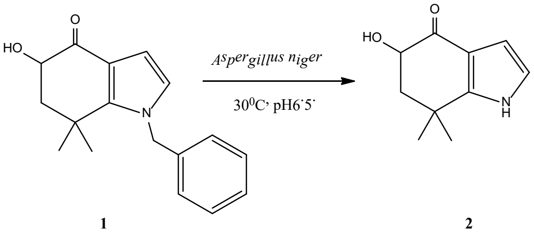
The benzofuranone and indole ring system is very likely the most widespread heterocycle in nature [1]. Benzofuranone and Indole derivatives have become important targets in the pharmceutical industry, because of the vast structural diversity of biologically active benzofuranone and indoles. There are so many well-known drugs, which contain the benzofuranone ring, some of the most recent being Griseofulvin, Roseophilin, Preladenant, Frusemide, Geiparvarin, Azimilide are antitumor, antihiertansif, antiarrhytmic drugs with an benzofuran scaffold. There are also so many well-known drugs, which contain the indol ring, some of the most recent being Naramig, Zomig, Maxalt, Nasea, Anzemet, Rescriptor, Serdolect, Lescol, Accolate, ReQuip. Indomethacin, Acemetacin and Etodolac are non-stereoidal anti-inflammatory drugs with indol scaffold [1,2].

In this study, first of all the chemoenzymatic synthesis of both enantiomers of pharmacologically interesting compound such as 4,5,6,7-tetrahydro-4-oxo-7,7-dimethyl benzofuran-5-yl acetate is synthesized starting from 7,7-dimethyl-6,7-dihydrobenzofuran-4(5H)-one by regioselective acetoxylation reaction [3,4]. Enzyme catalyzed kinetic resolution of this racemic acetoxy derivative furnished the corresponding enantiomers of acetoxy and hydroxy derivatives in high enantiomeric excesses. In the second part of the study, 4,5,6,7-tetrahydro-4-oxo-7,7-dimethyl benzofuran-5-yl acetate is converted its indole derivative via benzyl amine, then enzyme-mediated kinetic resolution is applied. Thus, 1-Benzyl-5-hydroxy-7,7-dimethyl-6,7-dihydro-1*H*-indol-4(5*H*)-one (**1**) are obtained for the first fime in the literature in good yields and high enantiomeric excesses. Furthermore, in this study the biotransformation of pharmacologically interesting compound such as 5-hydroxy-7,7-dimethyl-6,7-dihydro-1*H*-indol-4-(5*H*)-one (**2**) is also obtained for the first time by biotransformation reaction using microorganisms of *Aspergillus niger* .



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Financial support was funded by Yıldız Technical University (BAP 2012-01-07-KAP03) is gratefully acknowledged

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Keywords: Benzofuranone, indole, kinetic resolution, microorganism

S-E5-001

DETERMINATION OF COCAINE AND BENZOYLECGONINE IN BIOLOGICAL MATRIX BY HPLC AND LC-MS/MS.

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Cocaine is a strongly addictive stimulant that directly affects the brain. As one of the most effective naturally occurring central nervous system (CNS) stimulants, cocaine has a long history of use and abuse [1]. Cocaine was labeled the drug of the 1980s and 1990s because of its extensive popularity and use during that period. However, cocaine is not a new drug. In fact, it is one of the oldest known psychoactive substances. Cocaine is made from the leaves of the coca plant native to South America [2]. Cocaine (methyl benzoylecgonine) is a tertiary amine. Cocaine exists in illicit samples as the cocaine salt (hydrochloride) or as the cocaine base (crack). The most common form of illicit cocaine is the white crystalline, highly water soluble powder. The major metabolic pathways of cocaine metabolism involve 1) human carboxylesterase-1 (hCE-1)–mediated and spontaneous chemical hydrolysis of cocaine to benzoylecgonine and 2) pseudocholinesterase–2 and human carboxylesterase-2 (hCE-2)-mediated hydrolysis of cocaine to ecgonine methyl ester [3]. Most analytical tests for the detection of cocaine use involve the analysis of the metabolite, benzoylecgonine, in the urine. Benzoylecgonine is a major urinary metabolite of cocaine. Special chromatographic and spectroscopic techniques including mass spectrometry and nuclear magnetic resonance may be necessary to determine the origin of cocaine. Chromatographic methods can separate cocaine from impurities. Therefore, liquid chromatographic techniques were used in this study for better determination of cocaine and also chromatographic techniques are very specific, less cross-reactivity, minimizes false positives, very sensitive, detects low levels of drug, minimizes false negatives and quantitative testing methods. Cutoff concentration of benzoylecgonine was identifed by Substance Abuse and Mental Health Services Administration (SAMSHA) as 150 ng/mL and 100 ng/mL for initial test and confirmatory test, respectively [4]. Generally, the most common biologic samples used for the analysis of cocaine involve the blood and urine however saliva was also added as a matrix in this study. Practical, quick, reliable, precise and accurate, reproducible analytical methods have been developed and validated for cocaine and benzoylecgonine [5]. In addition this chromatographic techniques were used both initial test and confirmatory test for forensic toxicology. Confirmation analyses were made with LC-MS/MS and so reliable of HPLC results were shown. As a result of this study, it can be claimed that HPLC could be a good alternative for the analyses of various biological matrices in forensic studies. Also the matrices and concentrations were determined by HPLC instrument could be used where necessary according to SAMSHA cutoff values.

Acknowledgements: This work was funded by Republic of Turkey Small and Medium Enterprises Development Organization (KOSGEB) and Industrial Thesis Support Program (SAN-TEZ) of Republic of Turkey, Ministry of Science, Industry and Technology (Project Grant No: 0620.STZ.2014). And also, this study was partially supported by Ege University Scientific Research Projects (15-FEN-020).

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Keywords: cocaine, benzoylecgonine, HPLC, LC-MS/MS, biological matrix

POSTER
BİLDİRİLER

Poster Presentations

P-001

THE KINETIC EFFECT OF CARBON DIOXIDE CORROSION BY IMIDAZOLINE DERIVATIVES BASED ON SYNTHETIC OXY- AND PETROLEUM ACIDS

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The corrosion resistance of metals and alloys is a basic property related to the easiness with which these materials react with a given environment. One of the widespread methods is in application inhibitors for to prevent corrosion of metals [1]. Among the inhibitors, that are suitable requirement nitrogen-organic compounds, which are obtained on the basis of synthetic and natural petroleum acids have the great importance. This work has been devoted to the synthesized imidazoline derivatives based on the mixture synthetic petroleum and oxy acids and verified protection effect of CO_2 corrosion of these derivatives. The aim of work- the advent new inhibitors that has to match up the above-mentioned requirement and has high efficiency in CO_2-corrosion. In the synthesis of a high efficient corrosion inhibitor was used the mix of SPA and OSPA. For obtaining SPA+OSPA, the diesel fraction (boiled in 217-349 °C) separated from the Azerbaijan oils was used in the feedstock oxidation, which was previously dearomatized [2]. Synthesis imidazoline kept free amino on the basis of SPA+OSPA and polyethilenepolyamine (PEPA) are taken by two stages.

The kinetic effect of steel corrosion in 1 % NaCl solution saturated with CO_2 were studied ACM Gill AC potentiometer. The concentration range of the prepared surfactants was used 10, 25, 50 and 75 ppm for corrosion measurements. Corrosion of steel examples were learned without inhibitor sphere, too. Results of imidazolines that synthesized as inhibitor efficiency in different concentration were given in table 2.

Table 2. Efficiency corrosion protection of imidazoline derivatives in 1% solution of NaCl, saturated with CO_2

Concentration ppm	The corrosion current, mA/C	The braking effect,γ	Corrosion rate, mm/year	Metal loss, mg	Protection effect, %
Without inh.	0,296308	-	3,43	0,005446	-
10	0,006726	44	0,077953	0,000263	97,7
25	0,005103	58	0,059138	0,000648	98,3
50	0,00854	34,7	0,098976	0,000669	97,1
75	0,007547	34,3	0,102469	0,000675	97

It was found that, for imidazoline derivatives at 10 ppm concentration corrosion protection effect was 97,7 %, at 25ppm-98,3 %, at 50 ppm-97,1 %, at 75 ppm protection effect was 97 % after 20 hours of research. It was determined that, imidazoline derivatives obtained from synthetic petroleum and oxy-acids and polyethylenepolyamine, at 25 ppm consentration show the best results-98,3 %. It was proved by Langmuir adsorption isotherm that the chemisorption process of inhibitor occurs on the surface of metal.

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Keywords: synthetic petroleum and oxy acids, imidazoline, corrosion inhibitor

P-002

SYNTHESIS AND CHARACTERIZATION OF SOME SCHIFF BASE DERIVATIVES

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A Schiff base is the nitrogen analogue of aldehyde in which the C=O group is replaced by a C=N group [1]. Schiff bases, also known as N-substituted imines have been widely studied as ligands in the development of organic coordination complexes of transition metals [2]. Under ordinary conditions aromatic aldehydes and aromatic amines react very readily to give Schiff bases. Schiff base ligands may be contain a variety of substituents with different electron-donating or electron-withdrawing groups and therefore may be interesting chemical properties. We reported the synthesis, characterization and theoretical studies of Schiff base compounds. The synthesized molecules have been characterized by ^{1}H NMR, ^{13}NMR, ICP and UV-Vis spectroscopies.

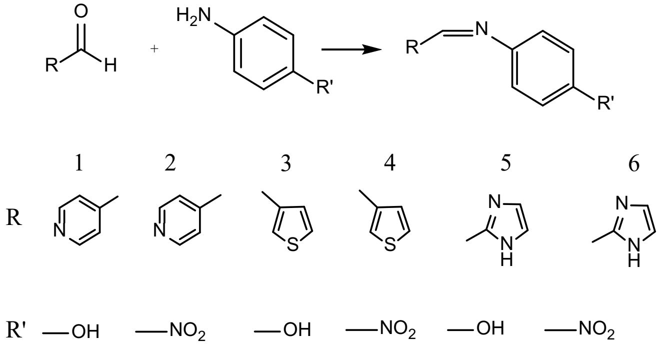

Figure 1: The synthesized Schiff base derivatives

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Keywords: Schiff base, Spectroscopic methods, Theoritical study

P-003

SYNTHESIS AND CHARACTERIZATION OF A NEW QUINAZOLIN-4-CARBOXYLIC ACID DERIVATIVE

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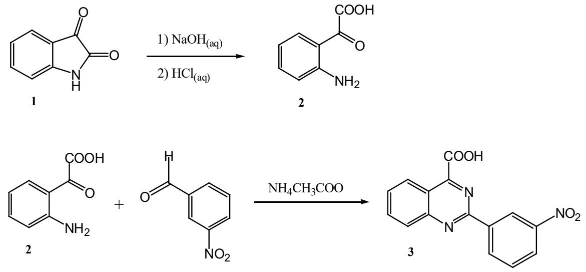
Six-membered heterocycles, such as quinazolines have been reported to possess diverse biological and therapeutic properties including anti-inflammatory [1], antibacterial [2], antiplasmodial [3], antitumor [4], antimicrobial, and anti-oxidant [5]. In addition, quinazolines are commonly found as building blocks for a wide variety of natural products such as alkaloids and in various other microorganisms [6]. In a recent report, quinazolines have been found to have excellent T-type calcium channel blocking activity [7].

This study was aimed to synthesize new quinazoline derivative. First 1H-Indole-2,3-dione (**1**) compound was hydrolyzed in an alkaline medium. After the reaction medium was added acid ($HCl_{(aq)}$). Thus (2-Amino-phenyl)-oxo-acetic acid compound (**2**) was obtained. Reaction of the obtained compound 2 with ammonium acetate and 3-Nitro-benzaldehyde was performed. 2-(3-Nitro-phenyl)-quinazoline-4-carboxylic acid (**3**) compound was synthesized as a result of this reaction.

The structures of synthesized compounds were characterized by various spectroscopic techniques (FT-IR, ^{1}H NMR, ^{13}C NMR and mass spectroscopy).



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Keywords: isatin, quinazoline, carboxylic acid

P-004

SOME NEW QUINAZOLIN-4-CARBOXYLIC ACID ESTER DERIVATIVES SYNTHESIS AND CHARACTERIZATION

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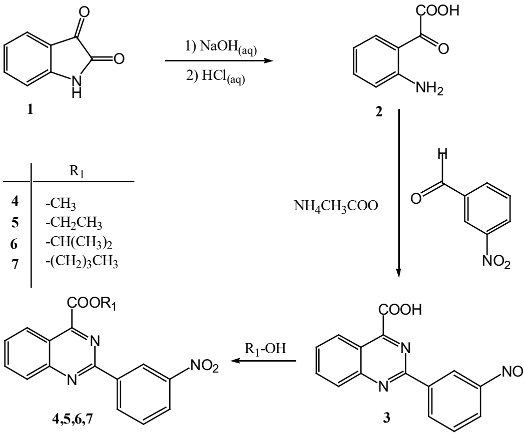
The development of quinazoline-based drugs has renewed the interest in developing new synthetic strategies for the synthesis of quinazolines. Quinazoline and its derivatives are important compounds found widespread in natural products and pharmaceuticals, which show interesting biological and physiological activities, such as antibacterial [1], antiviral [2], antitubercular [3] and anticancer activities [4].

This study was aimed to synthesis the esters of new quinazoline derivative containing carboxyl group. 1H-Indole-2,3-dione (**1**) compound was hydrolyzed in an alkaline medium. After the reaction medium was added acid ($HCl_{(aq)}$). Thus (2-Amino-phenyl)-oxo-acetic acid compound (**2**) was obtained. Reaction of the obtained compound 2 with ammonium acetate and 3-Nitro-benzaldehyde was performed. 2-(3-Nitro-phenyl)-quinazoline-4-carboxylic acid (**3**) compound was synthesized as a result of this reaction. The synthesized compound 3 was carried out reaction in sulfuric acid catalyzed with various alcohols. It was thus obtained ester derivatives (**4**-**7**) of quinazoline compound.

The structures of synthesized compounds were characterized by various spectroscopic techniques (FT-IR, ^{1}H NMR, ^{13}C NMR and mass spectroscopy).



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Keywords: quinazoline, carboxylic acid, ester

P-005

SYNTHESIS AND CHARACTERIZATION OF ALPHA AND BETA SUBSTITUTED ZINC AND METAL-FREE PHTHALOCYANINES BEARING 3,4,5-TRIMETHOXYPHENOXY GROUPS

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Phthalocyanines (Pc) are 18 aromatic compounds having π-electron system and composed from four isoindoline unit connected with the nitrogen atoms each other. This macro cyclic compounds possess π-electron delocalization with two-dimensional. Pcs are chemically and thermally resistant compounds and exhibit unusual optical and electrical behaviors due to their property. Thus they have a very wide range of applications in the materials science field [1,2]. For many years Pc compounds are used widely in the field of organic pigments and dyes. Apart from applications in traditional fields, Pcs are used in areas as liquid crystals, electrochromic display devices, photodynamic cancer therapy, non-linear optics, chemical sensors, optical data storage devices, Langmuir- Blodgett films, in recently [3,4].

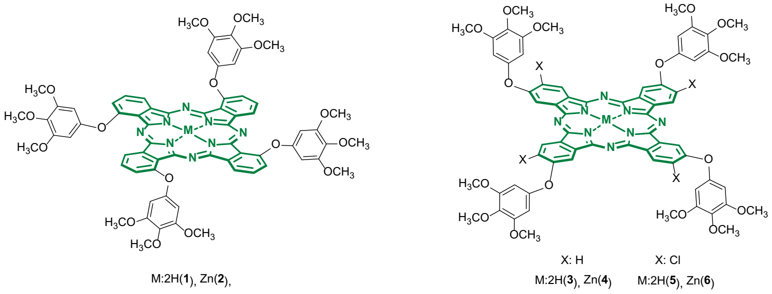

Figure 1: Phthalocyanines **1**-**6**

In the present study, 3-(3,4,5-trimethoxyphenoxy)phthalonitrile, 4-(3,4,5-trimethoxyphenoxy)phthalonitrile, and 4-chloro-5-(3,4,5-trimethoxyphenoxy)phthalonitrile were synthesized with nucleophilic substitution reaction of 3,4,5-trimethoxyphenol and 3-nitrophthalonitrile, 4-nitrophthalonitrile, 3,4-dichlorophthalonitrile, respectively. Subsequently, their oxo bridged 2HPcs and ZnPcs have been synthesized successfully. The characterization of the compounds was achieved by ^{1}H-NMR, UV-*vis*, IR and MALDI-TOF-mass spectroscopies.

Acknowledgements: We are thankful to The Foundation of Marmara University, The Commission of Scientific Research (BAPKO) (Project No: FEN-C-YLP-140115-0010).

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Keywords: Synthesis,Characterization, Alpha, Phthalocyanine, Trimethoxyphenoxy

P-006

CHIRAL LIQUID CRYSTALS WITH REVERSED ESTER LINKING GROUP

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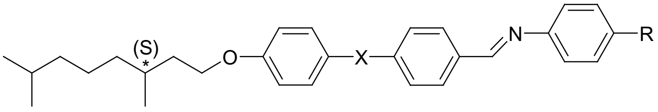
Chiral liquid crystals, which show helical superstructures, have attracted a special interest over the past several decades due to their electro-optic switching properties which allow to use them in numerous potential technological applications. In this multidisciplinary research field which combines the physics, chemistry, biology and engineering, the systematic investigation of the relation between molecular structure and mesophase behaviour is of great importance for generating a desired material which exhibits appropriate mesophase for applications[1].

Among the different linking groups (ester, alkene, alkyne, imine, azo and amide), ester linking groups are widely used in calamitic liquid crystalline compounds due to their chemical stability as well as high polarity. The polarity in ester group enables the molecules in their mesophases with layered structures. Therefore, the occurence of smectic phases is mostly expected for calamitic mesogens with ester linking groups. Besides, chiral smectic mesophases can be obtained by some structural modifications such as incorporation of a chiral chain into the one of the terminals of the calamitic molecular structure[2,3].

In this study, we have synthesized and characterized novel chiral calamitic mesogens, which are consist of three-aromatic rings connected to each other by one ester and one imine linking group. The terminals are composed of (*S*)-3,7-dimethyloctyloxy chain and an alkyl chain with different carbon number (see Figure 1). To investigate the direction of ester linking group on mesomorphism, we also synthesized the analogs with the reversed ester linking group by following a different synthetic procedure. The structures of the new compounds have been investigated by spectroscopic methods (UV, IR, ^{1}H-NMR and ^{13}C-NMR) and mesomorphic properties have been determined by polarization microscope and differential scanning calorimetry (DSC).



X = -COO and -OOC

Figure 1: The general structure of new chiral calamitic mesogens.

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Keywords: Chiral liquid crystals, smectic mesophases, helical superstructure, calamitic molecular structure

P-007

SYNTHESIS OF PHOSPHORUS CONTAINING POLYCYCLOOCTENE DERIVED BY ROMP PATHWAY

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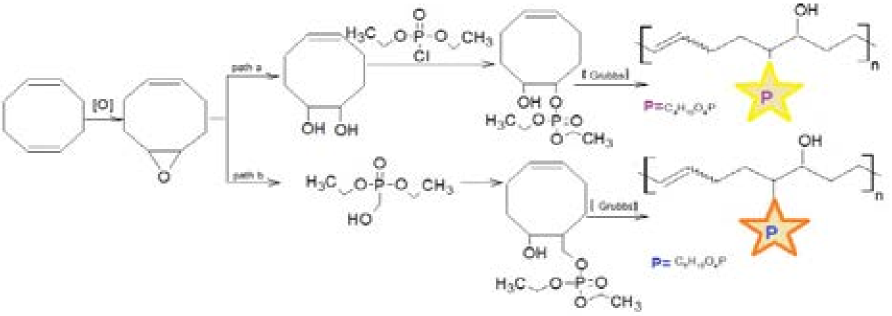
Phosphorus-containing polymers have broad application areas . One of them is their application of flame retardant properties. [1] Today, brominated aromatic flame retardants used in a wide range of products, incluiding textiles, electronics due to enviromental concerns and releasing hydrogen halide gas upon combustion are restricting their use, and requires the development of new flame retardants. The new one can be phosphorous-containing polymer. Another one is biomedical field. [2] Because of their properties such as biocompatibility, hemocompatibility, and protein adsorption resistance. It mainly describes relevant works achieved on these materials for various applications: dentistry, regenerative medicine, and drug delivery. In this study, the benefits of metathesis polymerization and phosphorus chemistry is applied for a highly versatile system. First, 1,5 Cyclooctadiene was converted to mono-epoxy cyclooctene with epoxidation reaction by using m-chloroperbenzoic acid. After that, two synthetic pathway were applied for the synthesis of phosphonate compounds as shown in Scheme 1. Structures of the polymers were confirmed by IR, ^{1}H NMR, and ^{13}C NMR spectroscopies. The thermal properties of the polymers were also investigated.



Scheme 1. Synthesis of phosphorus containing ROMP based polymers

Acknowledgement: This study was supported byTÜBİTAK 114Z666 and COST action CM1302 (SIPs) and the authors gratefully acknowledge the TÜBİTAK 114Z666 and COST action CM1302 (SIPs)

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Keywords: Phosphorous, Polycyclooctene, ROMP

P-008

SYNTHESIS AND ANTIOXIDANT PROPERTIES OF SOME 3-ALKYL(ARYL)-4- (3-BENZOXY-4-METHOXYBENZYLIDENAMINO)-4,5-DIHYDRO- 1*H*-1,2,4-TRIAZOL-5-ONES

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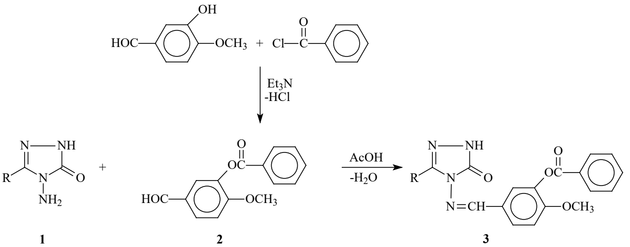
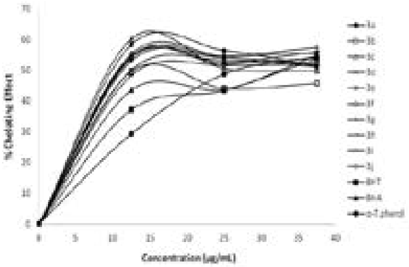
Antioxidants are extensively studied for their capacity to protect organism and cell from damage that is induced by the oxidative stress. A great deal of research has been devoted to the study of different types of natural and synthetic antioxidant. A large number of heterocyclic compounds, containing the 1,2,4-triazole ring, are associated with diverse biological properties such as antioxidant, anti-inflammatory, antimicrobial and antiviral activity. In the present study, due to a wide range of applications to find their possible antioxidant activity, ten new 3-alkyl(aryl)-4-(3-benzoxy-4-methoxybenzylidenamino)-4,5-dihydro-1*H*-1,2,4-triazol-5-ones (**3**) were synthesized from the reactions of 3-alkyl(aryl)-4-amino-4,5-dihydro-1*H*-1,2,4-triazol-5-ones (**1**) with 3-benzoxy-4-methoxybenzaldehyde (**2**) (Figure **1**). The structures of ten new compounds were established from the spectral data.



1, 3	**R**
a	CH_3
b	CH_2CH_3
c	$CH_2CH_2CH_3$
d	$CH_2C_6H_5$
e	$CH_2C_6H_4.CH_3$ (*p*-)
f	$CH_2C_6H_4.OCH_3$ (*p*-)
g	$CH_2C_6H_4.Cl$ (*p*-)
h	$CH_2C_6H_4.Cl$ (*m*-)
i	C_6H_5
j	◁

Figure 1: Synthesis route of compounds 2, 3.

In the second part of the study, the antioxidant properties of the compounds **3** were studied and evaluated using different three antioxidant assays; including reducing power, free radical scavenging and metal chelating activity. For the measurement of the reductive ability, Fe^{3+}-Fe^{2+} transformation was investigated in the presence of compound [1]. The hydrogen atoms or electrons donation ability of the synthesized compound was measured by DPPH· [2]. The chelating effect of ferrous ions by the compound was determined [3]. BHT, BHA and α-tocopherol were used as reference antioxidant compounds. As can be seen in the figure, all of the compounds showed good metal chelat activities.



Acknowledgements: This study was supported by a grant (Project Number: 2008.116.006.1) from Scientific Research Projects Coordination Unit of Karadeniz Technical University.

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Keywords: Synthesis, Schiff base, 1,2,4-triazol-5-one, antioxidant activity

P-011

SYNTHESIS OF NEW PROTIC 1-(ARYLSUBSTITUTED)-3,5-DIMETHYLPYRAZOLIUM SALTS

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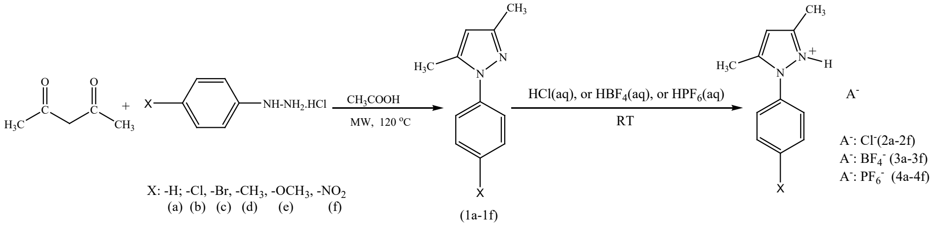
Ionic liquids (ILs) are organic salts comprised of ions and have melting points below 100 °C or even at room temperature [1,2]. The interest in ILs increased significantly over the last decade, both in academia and industry. Their unique properties such as negligible vapor pressure, low flammability, large liquid range, high thermal stability, high ionic conductivity, large electrochemical window, etc.,[3-6] render ILs excellent candidates for a numerous application [7,8]. Protic Ionic Liquids (PILs) are a subgroup of ILs that are formed very simply by the neutralization reaction of Bronsted acids and Bronsted bases [9]. In recent years there has been strong growth in the number of PIL publications, and it is expected that the properties of PILs will continue to be explored because of their advantages of being cheap, protic, and easy to synthesize and tailor [10].

In this work, in continuation of our studies [11] about aryl/alkyl-3,5-dimethylpyrazolium ionic liquids we aimed to synthesize 1-(arylsubstituted)-3,5-dimethylpyrazolium salts. The synthetic route for 1-(arylsubstituted)-3,5-dimethylpyrazolium salts are outlined in Scheme 1. 1-aryl-3,5-dimethyl-1H-pyrazole derivatives (1a-1f) were synthesized from arylhydrazinium hydrochloride derivatives and acetylacetone under MW irradiation. The reaction of 1-aryl-3,5-dimethyl-1H-pyrazole derivatives with conc.HCl(aq), HBF_4 (50% in water) and HPF_6 (55% in water) gave compounds 2a-2f, 3a-3f, 4a-4f, respectively in ethanol at room temperature. The structure of the pyrazolium salts was confirmed by FTIR, ^1H NMR, ^{13}C NMR, ^{19}F NMR (3a-3f and 4a-4f) and elemental analysis. The electrochemical stabilities of pyrazolium salts with BF_4^- anion were found higher than those of containing PF_6^- and Cl^- anions for the same cation.



Scheme 1: Synthetic pathway for the synthesis of 1-(arylsubstituted)-3,5-dimethylpyrazolium salts.

Acknowledgements: The authors are grateful to the Research Foundation of Gazi University (Project no. 05/2012-21) for supporting this study.

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Keywords: Protic ionic liquids, 3,5-dimethylpyrazole, Chloride, Tetrafluoroborate, Hexafluorophosphate

P-012

NOVEL BODIPY DERIVATIVES BEARING DIFFERENT IODINE ATOMS: SYNTHESIS, CHEMICAL AND PHYSICAL PROPERTIES

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Boron dipyrromethene (BODIPY) and its derivatives possess a great value in the last decade due to their unique properties [1]. They have widespread applications such as laser dyes in biological sensors owing to their high fluorescence efficiency in both solution and solid state, and photosensitizers in photodynamic therapy (PDT) of cancer due to their high photo, chemical and thermal stability [2]. Among the different chromophores, BODIPY dyes are of particular interest because of their large extinction coefficients, high energy transfer efficiencies [3], high fluorescence quantum yields, reasonably long excited singlet state lifetimes, good solubility and stability in many solvent systems.

In recent years, halogenated BODIPY derivatives have been great interest as photosensitizers for cancer treatment *via* PDT method [4]. Also this compounds can be modified easily using different type coupling reactions such as Suzuki, Sonoghasira or Heck. For this reason, we synthesized and characterized novel BODIPY derivatives including one, two, three and four iodine atoms on the BODIPY core. The chemical and physical properties of these BODIPY derivatives were also investigated in this work.

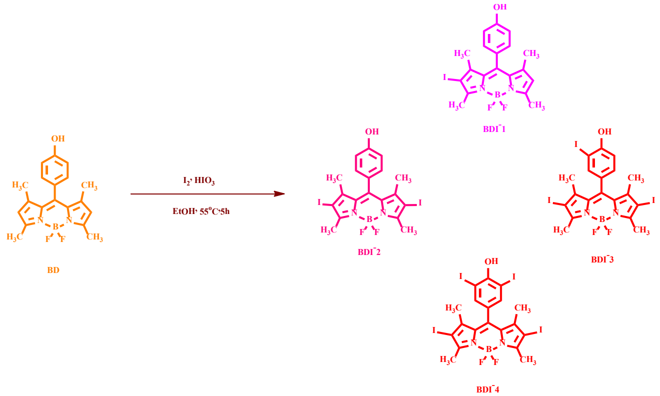

Figure: Synthetic route of novel BODIPY derivatives

Acknowledgements: This work was supported by the Scientific and Technological Research Council of Turkey (TUBITAK, Project number: 114Z924)

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Keywords: BODIPY, Singlet Oxygen, Iodination, Photochemical

P-013

SYNTHESIS OF METAL COMPLEXES OF SOME FORMAZANS OBTAINING FROM CINNAMALDEHYDE AND INVESTIGATION OF THEIR DYEING PROPERTIES USING DIFFERENT METHODS

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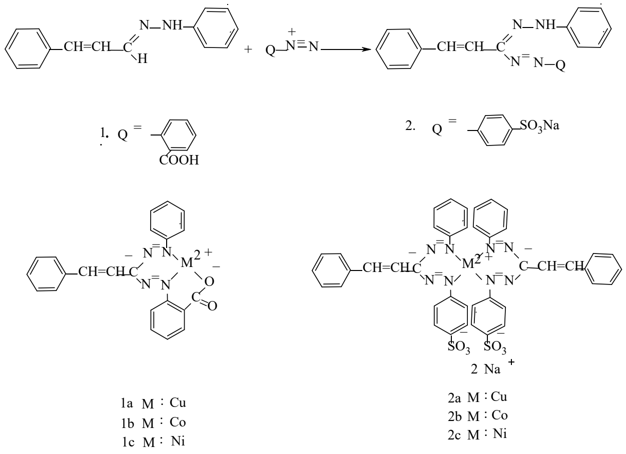
In recent years, formazans have been very important to be able to use as a reactive dye. Reactive formazan dyes are environmental friendly dyes due to water-soluble features and they contain sulfonamide, alkylsulfonyl, or sulfonic acid groups possess a high affinity for protein and polyamide fibers (1-5).

In this study, two formazans were synthesized by coupling cinnamaldehyde phenyl hydrazone which was obtained by activation of cinnamaldehyde with phenylhydrazone, with diazonium salts of anthranilic acid and sulfonilic acid. The complexes of Co^{+2}, Ni^{+2}, Cu^{2+} salts of these formazans were also synthesized. These compounds were characterized by elemental analysis, infrared (IR), ultraviolet–visible (UV–vis),^{1}H nuclear magnetic resonance (^{1}H -NMR) and ^{13}C- NMR spectra datas.

Investigation of availability of these compounds as dyes were carried out for this purpose. Two methods were applied. The first one was direct dyeing with these complexes. The other one was complex formation on the fibres. Finally, an investigation was carried out of which fastness values were higher and which method would be better according to the fastness values.



Scheme 1

References:

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Keywords: Formazans, Metal complexes, Dyeing, Fastness properties, Polyamide fibres

P-014

SYNTHESIS OF GUANIDINE BASED OXOTHIAZOLIDINE DERIVATIVES AND QUANTUM-CHEMICAL CALCULATIONS

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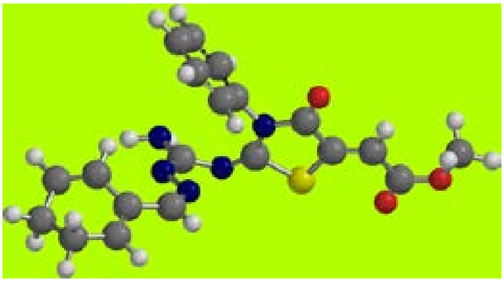
Thiazoles are synthetic intermediates and common substructures in numerous other biologically active compounds[1]. Owing to the various physiological activities of thiazolidinones, many thiazolidinone derivatives have been prepared, and several new methods for the preparation of substituted thiazolidin-4-ones have been reported [2,3]. Thiazolidin-4-one compounds display antimicrobial[4], antimycobacterial[5], anti-HIV, antiinflammatory[6], and anticancer activities.

In this presentation, we would like now to report the synthesis of thiazoline compounds from thiocarbamoylguanidines derivatives possessing N-H groups and one S=C bond which react with DMAD to give highly functionalized 4-oxothiazolidin-5-ylidene acetate derivatives.



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Keywords: Aminoguanidine, quantum chemical calculations, oxothiazolidine

P-015

SYNTHESIS AND CHARACTERIZATION OF NEW *meso*-β DIRECTLY LINKED PORPHYRIN-CORROLE HYBRID DYAD

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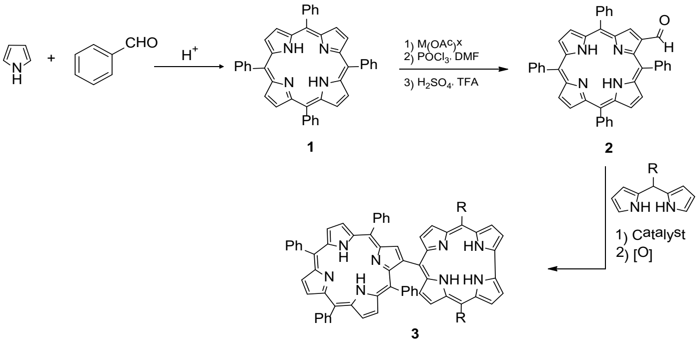
Porphyrins and corroles are macrocyclic aromatic compounds which have received much attention within the scientific community for a long time. Synthesis and functionalization of porphyrin and corroles has been an exciting area of search because of their potential applications in photosensitizers in cancer treatments (photodynamic therapy), the energy conversation from sunlight to electrical energy, oxidative catalysts, and biomimetic model systems of natural photosynthesis.[1,2]

Exploration of highly conjugated macrocyclic hybrid compounds is one of the current topic in organic synthesis and porphyrin chemistry. One of the important subfamily of this hybrid compounds is directly linked porphyrin-macrocyclic aromatic structures.[3] These compounds can be candidate that facilitate strong excitonic coupling between adjacent chromophores. Although there are several reports containing dyad hybrid compounds which have different bridge groups between porphyrin and various macrocycles, corroles are used limited in this field.

The study involves the synthesis and characterization of new *meso*-β directly linked porphyrin-corrole hybrid dyad. For the synthesis of porphyrin part of hybrid compound, 5,10,15,20-tetraphenylporphyrin (TPP) (**1**) is synthesized by the acid-catalysed reaction of pyrrole with benzaldehyde. After metallation and Vilsmeier-Haack formyllation of TPP, the metal is removed in strong acidic condition. The last step of the synthesis is the reaction of β-formyl 5,10,15,20-tetraphenylporphyrin with dipyrromethane structure to construct corrole macrocycle. Reaction conditions of this key step are optimized and effects of various parameters on reaction yield are investigated. The structure of hybrid compound is identified by using spectroscopic techniques.



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Keywords: porphyrin, corrole, macrocyclic aromatic compounds, photosensitizers

P-016

AN INVESTIGATION ON ONE POT MULTI COMPONENT UGI REACTION WITH FURFURYL AMINE AND FOLLOWED BY IMDAF CYCLOADDITION

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Ugi style reactions, known as multi component ideal reactions are used for atom economy and facile synthesis for the nitrogen containing compounds [1]. We have been working on intramolecular Diels-Alder reaction of furan (IMDAF) for more than 15 years [2], now these two strategies are combined and applied as one pot progress. Synthesized asymmetric secondary amines, **2** in our laboratory were used as amine figure and reacted with commercially available with aromatic aldehydes, **1** and isocyanides, **3** as one pot multicomponent reactions towards the synthesis of **4** in DCM**,** which would hopefully then undergoes intramolecular Diels-Alder (IMDA) cycloaddition in hot water or toluene to give final product of **5** (*Figure 1*). We have now some promising results for **4** (Table I) and currently optimizing the conditions of the reaction and will then perform Intramolecular Diels Alder Reactions of furan.

Table I

Entry	R_1	R_2	R_3	X	Yield, **4**
1	H	H	Cyclohexyl	Cl	67,6 %
2	NO_2	H	*tert*-butyl	Cl	47,0 %
3	Br	H	*tert* -butyl	Cl	47,9 %
4	NO_2	H	*tert* -butyl	Br	51,0 %
5	Br	H	*tert* -butyl	Br	20,1 %

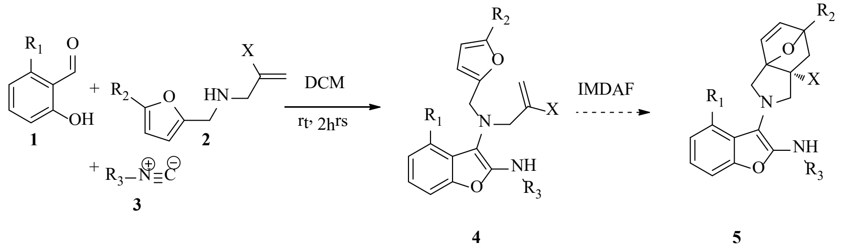

Figure 1: Ugi type multicomponent reaction using furfurylhaloalkenylamines followed by IMDAF cycloaddition.

Acknowledgements: We are grateful to Project Units of Nigde University, (PN: FEB-2015/38) for financial support of this work.

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Keywords: Ugi Reaction, IMDAF, Cycloaddition, one pot, Multi component, Furan

P-018

INHIBITION OF PEROXIDASE ACTIVITY BY SYMMETRIC AND UNSYMMETRIC SUBSTITUENT NOVEL

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Peroxidases (PODs, E.C 1.11.1.X) are widely present in different kinds of living organisms (animals, plants, microorganisms) [1]. Peroxidases are a member of the oxidoreductase family, and they catalyze the oxidation reaction of a wide variety of substrates, including phenol compounds using H_2O_2 as the electron acceptor [2]. Peroxidases have wide substrate specificity and high sensitivity. They have broader catalytic activity, and their activity can be accurately measured spectrophotometrically. Due to the above-mentioned features, peroxidases are useful tools for several biomedical, biotechnological, clinical, and industrial applications. They are commonly used as components in kits for medical applications and biosensors [3]. They are also used in many other applications such as for the removal of peroxidase from industrial effluents and foodstuffs, decolorization of waste, removal of phenolics from wastewaters, the stereospecific biotransformation of various organic molecules and chemical drugs , and polymerization of aromatic compounds and are also employed as indicators in food processing [4].

This study was used benzyl imidazolium salts as the inhibitor. Therefore benzyl imidazolium salts can be used as ligands for peroxidase purification. Furthermore, the Km, Vmax, Ki, and IC50 values and inhibition types were determined for benzyl imidazolium salts.

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Keywords: Benzyl imidazolium salts, Characterization, Inhibition, Peroxidase,Synthese

P-019

ONE POT ENVIRONMENTALLY BENIGN CASCADE REACTIONS OF FURANS; PROTECTION AND IMDA CYCLOADDITION

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Intramolecular Diels-Alder (IMDA) reaction of furan [1-4] under thermal conditions in aqueous media without any metal assistance or microwave promoted has been studied and described using different type of protective groups containing sulfonyl groups like, Mesyl and p-Nosyl, Tosyl. Protection and cycloaddition processes were performed as three components and one pot progress. IMDA cyclisation progress does not occur without protective groups even forced. Electronic properties of the protective groups are presumably effective and accelerate cyclization progress behaving driving force to give cycloadduct. Environmentally benign tandem progresses were afforded in aqueous media. This work allow to the development of a stereoselective tandem allylamine isomerization / Diels Alder cycloaddition sequence led to rapid assembly of complex nitrogen containing heterocycles as can be described “ideal reactions”.

Entry	R	X	Protective Groups	Yield(4:5)%
1	H	Br	Mesyl	26:74
2	CH_3	Cl	Tosyl	32:68
3	CH_3	Br	Mesyl	22:78
4	CH_3	Cl	Mesyl	25:75
5	CH_3	Cl	Mesyl	31:69
6	CH_3	Cl	*p*-Nosyl	35:65

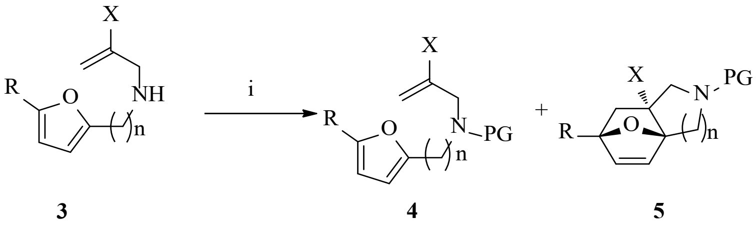

Figure 1: Tosyl-Cl, Mesyl-Cl, or *p*-Nosyl-Cl, Na_2CO_3, H_2O, 98°C, 4 days.

Acknowledgements: We are grateful to The Scientific and Technological Research Council of Turkey TUBITAK (PN: 107T831) for financial support of this work.

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Keywords: cycloaddition, IMDA, Furan, isoindoles, cascade reaktions

P-020

SYNTHESIS OF THIENOTHIOPHENE AND DITHIOPHENE TRIPHENYL AMINE COUPLES FOR ORGANIC CONDUCTIVE MATERIALS

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Thienothiophenes (TT) and dithienothiophenes (DTT) are electron rich structures which forms two fused thophene rings. This structural property brings them to materilal chemistry area as electron donor and makes them attractive for some electronic applications. As for triphenyl amin (TPA), it is another electron donor for electronic and optoelectronic areas. Especially TPA's tendency to easy reaction, such as coupling reaction serves as a donor nomination in our study [1-3]. In this study, we tried to synthesize TT and DTT by a developed methodology recently and combined with TPA by Suzuki couling reaction [4-5]. A few electronic material gave colourful and flouresence compound both solid and solution phases.

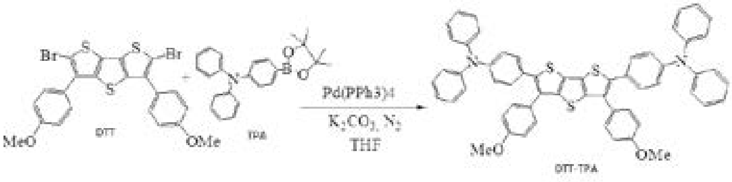

Figure 1: Synthesis path of DTT-TPA couple.

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Keywords: Conductive materials, dithienothiophene, thienothiophene, triphenyl amine

P-021

IMINE BASED CHIRAL ROD-LIKE LIQUID CRYSTALS

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In the last few decades as the technological advances in soft matter increase rapidly, one branch of soft matter, liquid crystals are substances that exhibit both crystalline and liquid properties due to their unique structures. The crystalline properties involve optical and anisotropy while the liquid-like properties are the molecular mobility and fluidity [1]. This behaviour of liquid crystals make them applicabile to many diverse fields such as electro-optics, biosensors, biomolecules, solar panels, batteries etc. [2]. Especially chiral calamitic liquid crystals have found use in electronical devices since the discovery of ferroelectricity in their mesophases. Therefore, both the design of novel liquid crystals and investigation of their mesophase properties as well as electro-optical behaviour are of great importance for modern technological applications.

Many factors such as the structure of rigid core unit, the number of aromatic rings, the type of linking groups between aromatic rings and variations of terminal chains (i.e. chiral units, fluorocarbon chains, branched groups, etc.) influence the mesogenity of the liquid crystals [3]. It is well known that calamitic mesogens, that chiral moieties are incorporated into their structures, exhibit interesting phases compared to their non-chiral homologue counterparts [3,4]. The variations of linking groups in the chemical structure are also effective on enhancing the stability and variety of mesophases as well as altering the transition temperatures.

In this study, the synthesis and liquid crystal properties of the new imine and salicyaldimine based calamitic liquid crystals with chiral side chains are reported. The structures of the synthesized compounds were characterized and enlightened by the common spectroscopic methods (^{1}H-NMR, ^{13}C-NMR, UV and IR). The liquid crystalline properties were investigated by polarised light optical microscopy (PM) and differential scanning calorimetry (DSC).

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Keywords: Liquid crystals, chirality, salicyaldimine

P-022

SYNTHESIS, CHARACTERIZATION AND ANTIOXIDANT ACTIVITIES OF NOVEL 1-(MORPHOLINE-4-YL-METHYL)-3-ALKYL(ARYL)-4-[4-(DIMETHYLAMINO)-BENZYLIDENAMINO]-4,5-DIHYDRO-1*H*-1,2,4-TRIAZOL-5-ONES

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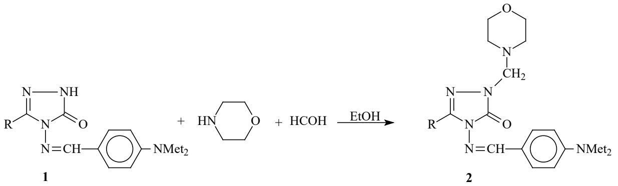
Triazoles are heterocyclic compounds that contain three nitrogen atoms. 1,2,4-Triazole and 4,5-dihydro-1H-1,2,4-triazol-5-one derivatives are reported to possess a broad spectrum of biological activities such as analgesic, antibacterial, antioxidant and antiparasitic properties [1-4]. Considering about the development of new hetero moieties by combining potential biological active scaffolds, an attempt was made here to obtain 1,2,4-triazoles bearing morpholine ring and to evaluate their antioxidant activity.

In this regard, eight new 1-(morpholine-4-yl-methyl)-3-alkyl(aryl)-4-[4-(dimethylamino)-benzylidenamino]-4,5-dihydro-1*H*-1,2,4-triazol-5-ones (**2**) were synthesized by the reactions of 3-alkyl(aryl)-4-[4-(dimethylamino)-benzylidenamino]-4,5-dihydro-1*H*-1,2,4-triazol-5-ones (**1**) with formaldehyde and morpholine (Figure **1**). 3-Alkyl(Aryl)-4-[4-(dimethylamino)-benzylidenamino]-4,5-dihydro-1*H*-1,2,4-triazol-5-ones (**1**) were synthesized according to literature [5]. The titled compounds characterized by IR, ^{1}H NMR and ^{13}C NMR spectral data.

In the second part of the study, the antioxidant properties of the compounds **2** were studied and evaluated using different three antioxidant assays; including reducing power, free radical scavenging and metal chelating activity.



1, 2	R
a	CH_3
b	CH_2CH_3
c	$CH_2C_6H_5$
d	$CH_2C_6H_4.CH_3$ (*p*-)
e	$CH_2C_6H_4.OCH_3$ (*p*-)
f	$CH_2C_6H_4.Cl$ (*p*-)
g	$CH_2C_6H_4.Cl$ (*m*-)
h	C_6H_5

Figure 1: Synthetic pathway of compounds **2**.

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Keywords: Synthesis, Mannich base, antioxidant acivity

P-023

SYNTHESIS OF COMPLEX ESTERS OF VICINAL DICARBOXYLIC ACIDS

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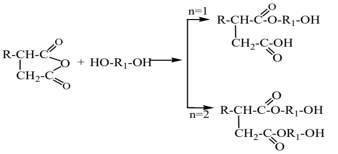
Recently, much attention is paid to the production of complex esters. Complex esters can be synthesized by using dicarboxylic acid, aliphatic glycols and aliphatic fatty acids. Synthesized a number of complex esters based on anhydride of alkenylsuccinic acids (AAA), glycols (ethylene glycol, propylene glycol, 1,3-butylene glycol, pentaerythritol, etc.) [1]. To obtain complex esters the esterification was carried out step-by-step (two or three steps).

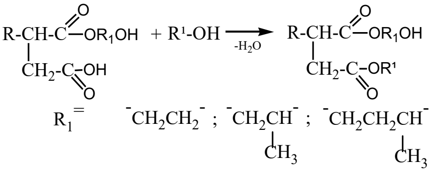


(I)

(II)

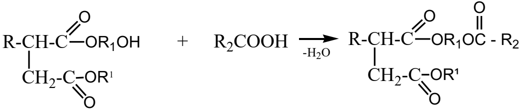
At the first step an esterification was carried out with glycols in the ratio of anhydride: glycol =1:1 or 1:2. Considering that the anhydride ring opens under milder conditions, the first step of the reaction was carried out at 120-130°C without catalyst. The end of reaction was determined by value of acid number. The duration of the first stage was usually 2-4 hours.

At the second step ester I was esterified by aliphatic alcohol:



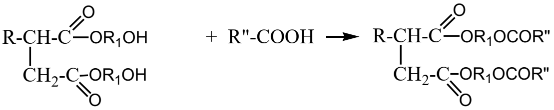
(Ia)

Not subjecting reactionary mass to processing, carried out the third step, was esterified a product with fatty acids. Acid was taken in the ratio (Ia): fatty acid 1: 1-2. The end of reaction was determined by amount of the allocated water, also by value of acid number.



(IIa)

Ester II was also subjected to esterification with fatty acids. Further diglycolic ester was esterified by fatty acids (caproic, pelargonic) and obtained complex ester containing four ester groups.



(IIIa)

The ratio of acid to ester II was 2: 1. The second step was carried out in the same flask. The resulting dark colored esterificate was subjected to vacuum distillation. In the process were received by-products: monoesters, polyesters, condensation products. Complex esters represent oily liquids with a high boiling point. Synthesized esters can be used as the base and components to the synthetic and mineral lubricating oils.

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Keywords: anhydride of alkenylsuccinic acids (AAA), vicinal dicarboxylic acid, complex esters

P-024

SYNTHESIS OF NOVEL FLUOROQUINOLONE-TRIAZOLE HYBRID COMPOUNDS AS ANTIMICROBIAL AGENTS

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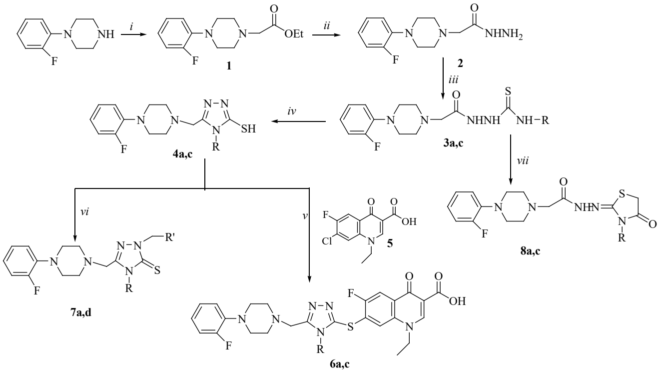
Bacterial resistance towards currently used antibiotics has become a major worldwide problem. Development of novel antibacterial agents with little or no bacterial resistance is therefore an important topic of current research. Quinolones and fluoroquinolones are broad spectrum antibiotics which have been used extensively to treat various bacterial infections such as respiratory and urinary tract diseases. Four generation of quinolone antibiotics have been developed to combat Gram-positive, Gram-negative and anaerobic bacterial infections [1]. 1,2,4-Triazole ring is known as versatile lead molecule for designing potential bioactive structures. Its derivatives have been incorporated to yield a wide variety of therapeutically important activities including antibacterial, anti-inflammatory, CNS depressant, anti-tubercular, anti-HIV, and antiproliferative [2]. In view of these facts, the aim of the present study is to obtain 1,2,4-triazole derivatives incorporating fluoroquinolone and Mannich base structures as hybrid molecules possessing antimicrobial activity. All the compounds were tested for their antimicrobial activities. The newly synthesized compounds, exhibited good to slight activities against the test microorganisms with the mic values varying between 0.24-500 μg/mL. Among these compounds, 6a-c caused to excellent activity towards the test bacteria with the mic values between 0.24-1.9 μg/mL.



3a, 4a, 6a, 8a: R= phenyl; **3b, 4b,6b, 8b**: R: ethyl; **3c, 4c, 6c, 8c**: R=benzyl
7a: R= benzyl; R'=methyl piperazine; **7b**: R= benzyl; R'= phenyl piperazine
7c: R= phenyl; R'=norfloxacine; **7d:** R=phenyl; R'= ciprofloxacine

Scheme 1. Reagent and conditions: *i*: $BrCH_2COOEt$, Et_3N,THF, rt; *ii*: $H_2NNH_2.H_2O$, MW; *iii*: suitable alkyl(aryl) isothiocyanate, EtOH, MW; *iv*: NaOH, MW; *v*: compound 5, Et_3N, DMF, MW; *vi*: HCHO, norfloxacine and ciprofloxacine, DMF, rt, *vii*: $BrCH_2COOEt$, NaOAc, MW.

Acknowledgements: The support provided by Scientific and Technological Research Council of Turkey (TUBITAK, Project no: 113Z181) and Karadeniz Technical University, BAP, Turkey (Ref. No. 8623) and is gratefully acknowledged.

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Keywords: fluoroqionolone, mannich base, 1,2,4-triazole

P-025

SYNTHESIS AND CHARACTERIZATION OF SOME AZOLE DERIVATIVES

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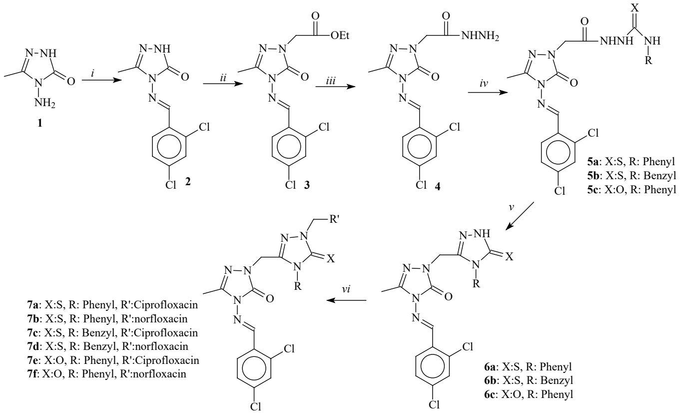
During the past decades, the incidence of microbial infection has increased to alarming levels all over the world as a result of antimicrobial resistance. Thus, in recent years, much attention has been focused on addressing the problem of multi-drug resistant (MDR) bacteria and fungi resulting from the widespread use and misuse of classical antimicrobial agents. Due to this reason, discovering of new classes of antimicrobial agents with novel mechanisms is crucial to combat multi-drug resistant infections. Organic compounds incorporating heterocyclic ring systems continue to attract considerable interest due to their wide range of biological activities. Among different five-membered heterocyclic systems 1,2,4-triazoles and 1,3,4-thiadiazoles and their derivativeshave gained importance as they constitute the structural features of many bioactive compounds. It is known that triazole and thiadiazole rings are included in the structure of various drugs [1-4]. Schiff bases represent an important class of organic compounds, especially in the medicinal and pharmaceutical fields. Thus, development and synthesis of novel Schiff base derivatives as potential chemotherapeutics still attract the attention of organic and medicinal chemist [5]. Many studies reported the biological activities of Schiff bases, including their anticancer, antibacterial, antifungal, and herbicidal activities [6].



i:2,4-dichlorobenzaldehyde,Etoh,Reflux, *ii*: Ethylbromoacetate,THF,rt, *iii*: $NH_2NH_2.H_2O$,EtOH,reflux, *iv*: iso(thio)cyanate,DCM,rt, *v*: NaOH/H_2O,reflux, *vi*: HCOH, rt, DMF

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Keywords: 1,2,4 Triazole, antimicrobial, mannich base

P-026

SYNTHESIS AND ANTIMICROBIAL ACTIVITIES OF NEW 1,2,4-TRIAZOLES, MANNICH BASES, CONAZOLES AND FLUOROQUINOLONES

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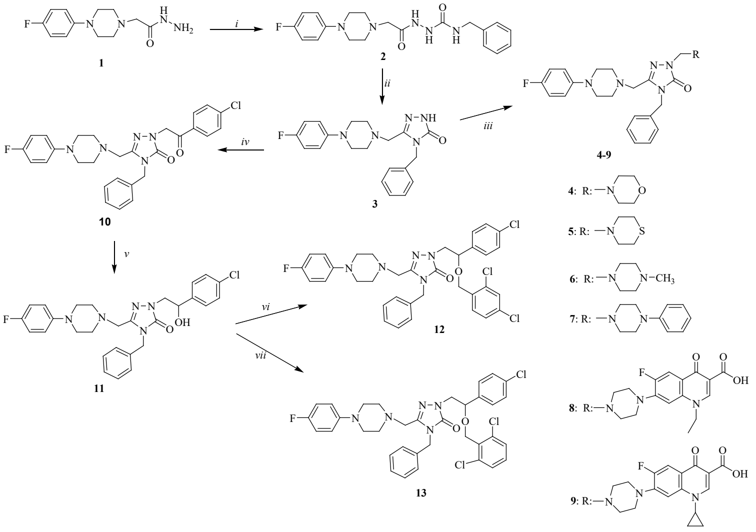
The treatment of infectious diseases still remains an important and challenging problem due to a combination of factors including emerging infectious diseases and the increasing number of multidrug resistant microbial pathogens. Due to this reason, new classes of antibacterial agents with novel mechanisms are crucial need to combat with the multidrug-resistant infections [1]. There are a number of antimicrobial compounds containing a 1,2,4-triazole ring in their structures such as Fluconazole, Itraconazole, Voriconazole, Ravuconazole and Posaconazole that are important antifungal drugs [2]. In recent years, Mannich bases have gained importance due to their application in pharmaceutical chemistry. They have been found to possess antibacterial, antifungal, anticancer [3], antitubercular [4], analgesic and anti-inflammatory properties.

The spectral data and elemental anlyses have support the proposed structures.



Scheme 1: *i*: Benzyl isocyanate; *ii*: NaOH; *iii*: morpholine (for 4), thiomorpholine (for 5), methylpiperazine (for 6), 1-pehenylpiperazine (for 7), norfloxacin (for 8), ciprofloxacin (for 9), HCHO; *iv*: EtOH, Na, ClC$_6$H$_4$COCH$_2$Br, reflux; *v*: EtOH, NaBH$_4$, reflux; *vi*: THF, NaH, 2-4-dichloro benzyl cloride, reflux; *vii*: THF, NaH, 2-6-dichloro benzyl cloride, reflux.

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Keywords: 1,2,4-triazole, Mannich base, Conazole, Quinolone

P-027

SYNTHESIS OF SOME FLUORO-SUBSTITUTED FLAVONOID DERIVATIVES AS ANTI-CANCER AGENTS

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Flavonoids are, a group of poly-phenolic compounds, found in the structure of many natural products. Flavonoid derivatives still attract much attention as drug candidates because of their wide-ranging biological activities such as anti-allergic, anti-viral, anti-inflammatory, anti-diabetic, anti-microbial, and anti-cancer etc [1-3].

Drug candidate compounds containing fluorine in recent years has become quite common. The introduction of fluorine or fluorine containing group to a molecule significantly changes its features. There are no elements or groups that cause similar effects on molecules. On the other hand, the physical and chemical properties of the molecule can be changed due to the high electronegativity of fluorine.

Figure 1 shows the general synthetic scheme. Here, we report the syntheses of some flavonoid type compounds with fluorine substituents on their B-rings[4]

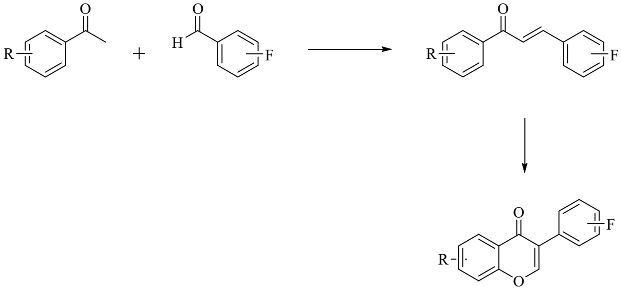

Figure 1. General synthetic plan for target compounds.

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Keywords: Synthesis, Flavonoids, Biological activity

P-028

PHOSPHORUS-NITROGEN COMPOUNDS: THE REACTION OF HEXACHLOROCYCLOPHOSPHAZATRIENE WITH 1,6-HEXANE-DIOL AND NUCLEAR MAGNETIC STUDIES OF THE PRODUCTS*

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Reactions of hexachlorocyclotriphosphazatriene, $N_3P_3Cl_6$ (**1**) with 1,6-hexane-diol (**2**), in (1:1:2, 1:2:4 and 1:3:6) stoichiometries, in THF solution, at room temperature and under refluxing conditions, yield a total of 8 products: one open chain, $N_3P_3Cl_5[O(CH_2)_nOH]$ (n= 6); one mono-spiro, $N_3P_3Cl_4[O(CH_2)_nO]$ (n= 6); its isomer mono-ansa, $N_3P_3Cl_4[O(CH_2)_nO]$ (n= 6); one dispiro, $N_3P_3Cl_2[O(CH_2)_nO]_2$ (n= 6); its isomer spiro-ansa, $N_3P_3Cl_2[O(CH_2)_n]$ (n= 6); one single-bridged, $N_3P_3Cl_5[O(CH_2)_nO]N_3P_3Cl_5$ (n= 6); one double-bridged, $N_3P_3Cl_4[O(CH_2)_nO]_2N_3P_3Cl_4$ (n= 6); and one triple-bridged, $N_3P_3Cl_3[O(CH_2)_nO]_3N_3P_3Cl_3$(n= 6) derivatives. Their structures have been characterized by MS, ^{31}P, ^{1}H and ^{13}C NMR spectroscopy.

The results obtained, based on the synthesis, characterization, product types, and the relative yields, are compared with those of previous studies on the reactions of **1** with 1,2-ethane-, 1,3-propane-, 1,4-butane-, 1,5-pentane-, and 1,6-hexane-diols [1-5].

The spiro derivatives are the mojor products for the 1,2-ethane-, 1,3-propane-, 1,4-butane- and 1,5-pentane-diols, whereas, reactions with hexane-1,6-diol, give predominately bridged derivatives. The spiro-ansa compound is considerably larger amount than the lower homologue diols. It is also observed that, with increasing chain length of the diol, there is a decrease in the product formed by intramolecular reactions (spiro or ansa compounds) and accompanying increase in the amount of products formed by intermolecular reactions (single-, double- and tri-bridged compounds) of hexachlorocyclotriphosphaze (**1**).

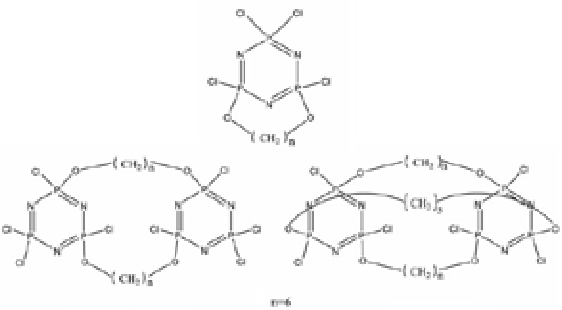

Figure 1. Structures of the cyclophosphazene derivatives

*This work was supported by Scientific Research Projects Coordination Unit of Bilecik Şeyh Edebali University (Project number: 2013-02.BİL.04-02).

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Keywords: Hexachlorocyclotriphosphazene,1-4-butane-diol, 1-6-hexane-diol, spiro compounds, ansa structures

P-029

THE SYNTHESIS OF DIFFERENT AZULENE DERIVATIVES

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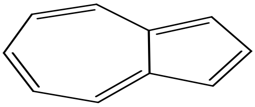
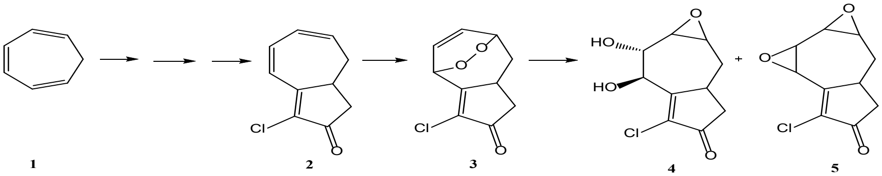
Azulene, an isomer of naphthalene is well-known as a blue-coloured non-benzenoid aromatic compound and many scientists have been concentrating much attention in view of physical organic and pharmaceutical chemistry[1]. Guaiazulene easily derived from a natural compound has been studied for a long time[2] and its derivative is used as a potent pharmaceutical drug[3]. Furthermore, azulene derivatives have been recently also focused as photo-reactive materials[4].



azulene

Several azulene derivatives, in fact, have been known to exhibit various biologicalactivities, such as insect anti-feeding agent[5], anti-fungal infections of skin and nails[6], anti-inflammatory agents[7], anti-oxidant therapeutics[8], and anti-microbial agents[9]. Subsequently, azulenes and their derivatives have attracted theattention of chemists.

In our work, compound **2** was synthesised from cycloheptatriene **1**, as described in literaure.[10] Compound **3** was obtained with the photooxygenation of compound **2.** Thereaction of endoperoxide **3** with CoTPP gave compound **4** and **5.**



1 **2** **3** **4** **5**

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Keywords: azulene, cycloheptatriene, photooxygenation

P-030

THEORETICAL AND SPECTROSCOPIC STUDIES OF 1-(MORPHOLINE-4-YL-METHYL)-3-BENZYL-4-(4-ISOPROPYLBENZYLIDENAMINO)-4,5-DIHYDRO-1*H*-1,2,4-TRIAZOL-5-ONE MOLECULE

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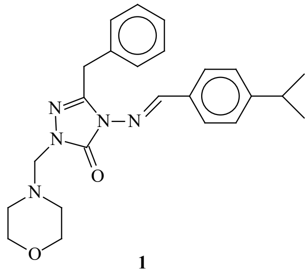
In this study, 1-(morpholine-4-yl-methyl)-3-benzyl-4-(4-isopropylbenzylidenamino)-4,5-dihydro-1*H*-1,2,4-triazol-5-one (**1**) molecule, which was synthesized from the reaction of 3-benzyl-4-(4-isopropylbenzylidenamino)-4,5-dihydro-1*H*-1,2,4-triazol-5-one with morpholine and formaldehyde, was optimized by using the B3LYP/6-31G (d,p) and HF/6-31G (d,p) basis sets [1,2]. 1H-NMR and 13C-NMR isotropic shift values were calculated by the method of GIAO using the program package Gaussian G09W [2]. Experimental and theoretical values were inserted into the grafic according to equatation δ exp=a+b. δ calc. The standard error values were found via SigmaPlot program with regression coefficient of a and b constants. IR absorption frequencies of analysed molecule were calculated by two methods. Then, they were compared with experimental data, which are shown to be accurate. Infrared spectrum were composed by using the data obtained from both methods. The veda4f program, was used in defining IR data, which were calculated theoretically [3]. Additionally, this compound was found bond angles, bond lengths, the HOMO-LUMO energy, electronegativity and mulliken charges by using the B3LYP/6-31G (d,p) and HF/6-31G (d,p) basis sets.



1

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Keywords: 4,5-dihydro-1H-1,2,4-triazol-5-one, Mannich Base, GIAO

P-031

SYNTHESIS OF MOLECULAR TWEEZERS AND ITS NAKED-EYE CHEMOSENSING AGAINST Fe^{3+}

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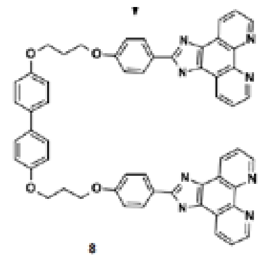

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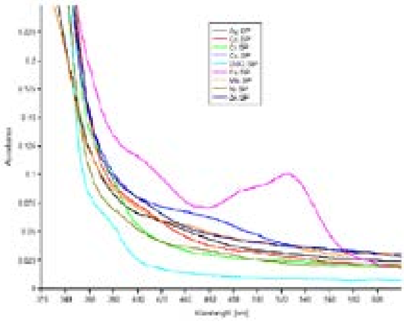

We have synthesized a molecular tweezers derived from 1,10-phenanthroline was synthesized and characterized by using NMR, EIMS and UV studies. We call it "dugdugi" (**8**) due its structural similarity with the monkey charmer's drum. Bisphenol was alkylated with 1,3-dibromopropane and reacted with 4-(1*H*-imidazo[4,5-*f*][1,10]phenanthrolin-2-yl)phenol to obtain **8**. 30 $\mu molL^{-1}$ solution of **8** was prepared in 10 % DMF in ethanol and was stirred for 30 min with 30 μ L^{-1} ethanolic solutions of Co^{2+}, Cr^{3+}, Cu^{2+}, Fe^{3+}, Mn^{2+}, Ni^{2+}, Ag^{+}, and Zn^{2+}, all nitrates. Chemosensor **8** switched-on in the presence of Fe^{3+} by showing pink color while it remained turn-off in the presence of other metals. The UV spectra of the molecular "dugdugi" showed a peak at 279 nm which shifted to 290 nm after interacting with Fe^{3+}. A new peak also appeared at 524 nm.

References

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Keywords: Molecular twzeezers, naked-eye chemosensor, Phenanthroline, Synthesis

P-032

O-CARBORANE CONTAINING POLYSULFONES BY CLICK CHEMISTRY

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Aromatic polysulfones are high performance polymers with excellent chemical and thermal stability, excellent strength and flexibility, transparency, as well as a high glass transition temperature and good film forming properties [1-3]. The properties of the polysulfone polymers may be improved by incorporation of functional groups.

In this study, functional polysulfones with pendant carborane units was synthesized via “click” chemistry methodology. First, polysulfone was modified by chloromethylation and subsequent azidation process. Carborane-alkyne (CA) was prepared independently as a click component. Finally, azido functionalized polysulfone (PSU-N_3) was coupled to CA with high conversion by click chemistry. According to the results, carborane functionalized PSU (PSU-CA) showed improved thermal properties compared to pristine PSU.

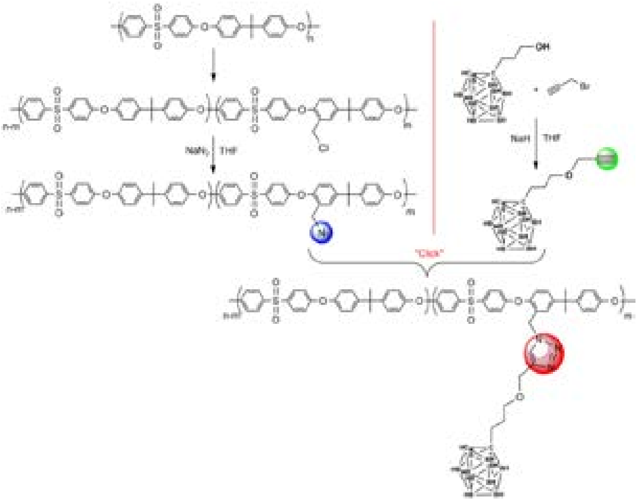

Figure 1: General scheme for the synthesis of o-carborane containing polysulfone.

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Keywords: Carborane, Click Chemistry, Polysulfone

P-033

HUNTITE/HYDROMAGNEZITE AS FIRE RETARDANT IN POLYMER COMPOSITES

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Hydromagnesite, huntite and their mixtures have important industrial applications and usages. Endothermic decomposition of these minerals over a temperature range similar to that of commonly used polymers and their release of water and carbon dioxide, has led to these mixtures being successfully used as fire retardants [1,2]. In this study, flame retardant properties of huntite/hydromagnezite in polymer composite coating materials were investigated and tried to be developed. Composite sample formulations were prepared by adding different amounts (10%, 20%, and 30% etc.) of environmentally friendly (halogen-free) flame retardants such as huntite, magnesium carbonate hydroxy hydrate to polyester-epoxy resin. The synthesized polymer composite materials were then deposited onto metal plates which were characterized by XRD, FT-IR, TG/DTA and SEM analysis. In Figure 1, X-Ray Diffraction pattern, SEM image and TG/DTG profile of Huntite are presented. LOI and U94 flammability tests were performed to examine flame retardant properties of these composite materials.

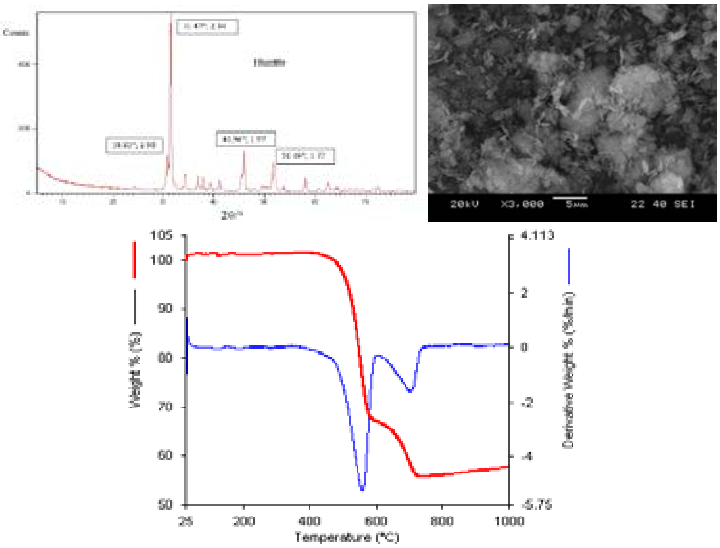

Figure 1: a) XRD pattern and b) SEM image and c) TG/DTG Profile of huntite

Acknowledgements: The Authors thank to Prof. Dr. Cahit Helvacı and Berk Çakmakoğlu for providing huntite samples

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Keywords: huntite, fire retardant, polymer composite

P-034

EFFECT OF CONCENTRATION ON SYNTHESIS AND CHARACTERIZATION OF ZnO NANOSTRUCTURES BY HYDROTHERMAL METHOD

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Zinc oxide (ZnO) is an important semiconductor material for devices that require good performance at room temperature (RT), because Zinc oxide (ZnO) is a direct band gap semiconductor with hexagonal wurtzite structure, a gap energy of about 3.4 eV, and a large exciton binding energy of 60 meV, and also good stability in ambient environments [1-4]. ZnO is a versatile material with potential applications in optical and optoelectronic devices: paints, ceramics, catalysts, varsities, gas sensing, light-emitting devices, and solar cell [5,6]. Many physical and chemical techniques such as spray pyrolysis [7], a direct precipitation method [8], sol–gel [9], thermal decomposition [10], chemical vapor deposition [11], novel combustion [12], solid state reaction [13], and hydrothermal reaction [14,15] have been developed to synthesize ZnO and doped-ZnO nanostructure powders. The hydrothermal synthesis of fabricating ZnO nanostructures comes to for among the other technics due to its tolerable growth condition, good potential for envorimentally-safe large scale production, suitability to any type of doping and easy control of dopant concentration and low reaction temperature to adaptability into the plastic electronics and microelectronics. In this study, zinc oxide nanopowders prepared in different concentrations have been synthesized using hydrothermal method and their structural, optical properties have been investigated by using IR, XRD, SEM-EDS, UV–visible diffuse reflectance spectroscopy techniques.

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Keywords: ZnO, hydrothermal process, diffuse reflactance spectroscopy, X-ray diffraction

P-035

PREPARATION AND SIZE CONTROL OF BOVINE SERUM ALBUMIN NANOPARTICLES BY SHOCKWISE AGGREGATION

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Protein based nanomaterials have gained significant interest in today's biotechnology, especially in food and pharmaceuticals industries, due to their wide applicability and superior characteristics [1, 2]. There is a continuing drive to optimize bioactivity, stability, shelf life, scope of use and bioavailability of protein products by implementation of nanotechnology [3].

There are three common methods for the preparation of protein based nanoparticles namely, emulsification, desolvation and coacervation. Desolvation method involves slow addition of a desolvation agent, such as natural salts, water-miscible organic solvents or non-ionic polymers, to the aqueous solutions of proteins, that changes the tertiary structure of protein and leads denaturation [4]. On the other hand, it is well-known that the shockwise addition of the same desolvating agents to the aqueous solutions of proteins, leads to their precipitation as physical aggregates of protein molecules without denaturation [5]. Although this shockwise aggregation method is extensively used in the immobilization of the industrially important enzymes as cross-linked enzyme aggregates, the particle density, particle size distribution, and the reproducibility of the method are poorly investigated. Increasing our understanding of these parameters is greatly important for the use of shockwise aggregation method to prepare protein nanoaggregates for food and pharmaceuticals industries.

In this study, ethanol was used as a desolvating agent and the effects of ethanol concentration, intermittent addition and pH on the particle size distributions and particle morphologies of bovine serum albumin (BSA) nanoparticles that have prepared with shockwise aggregation method is investigated by turbidity, dynamic light scattering (DLS) and transmission electron microscopy (TEM) methods respectively.

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Keywords: Bovine Serum Albumin, Desolvation, Polymeric Nanoparticle, Size Control, Intermittent Addition

P-037

DETECTION OF TOXIC MERCURY IONS IN THE AQUEOUS SOLUTION OF FLUORESCENT CARBON NANOPARTICLES

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Recently, parallel to population growth which influences the industrials development, heavy metal pollution of environmental resources causes a big threat for human health. It is known that mercury is one of the most dangerous heavy metal ion which shows toxic effect even at low concentrations. The most harmful form of the mercury ion is methyl mercury that causes neurological damage and other severe health problems [1]. Mercury ions can be detected using HighTech analytical devices including Atomic Absorption Spectroscopy (AAS), Chromatography, X-ray Photoelectron Spectroscopy (XPS) and Inductively Coupled Plasma Mass Spectrometer (ICPMS). However, detection of heavy metals with those devices is neither economic nor time-efficient. Therefore, it is needed to evolve simpler, practical and more economic techniques that can detect mercury ions in water, physiological media and more complex matrixes, such as food and soil, with high selectivity and sensitivity [2]. Carbon nanoparticles (CNPs) are new and interesting members of carbon based nanomaterials which could have great potential in various applications due to their structure anchored photoluminescence (PL) behaviors [3]. In this work; detection of mercury ions using CNPs that have been synthesized from natural carbon sources by thermal synthesis method will be investigated. Upon addition of different heavy metal ions in aqueous solution of CNPs, changes in fluorescent emission will be analyzed for each heavy metal ion and compared with the mercury. Finally, fluorescence based mercury ion detection in aqueous solutions of carbon nanoparticles will be reported by means of the selectivity and sensitivity of the method.

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Keywords: carbon nanoparticles, heavy metal detection, mercury ions detection.

P-038

EVALUATION OF DIFFERENT POLYMERS AS SURFACE PASSIVATION AGENTS AND INVESTIGATION OF THEIR EFFECT ON THE FLUORESCENCE AND SURFACE PROPERTIES OF CARBON NANOPARTICLES

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Fluorescent carbon nanoparticles, in another term carbon nanodots (CNDs), are new and special members of carbon based nanomaterials [1]. This highly biocompatible nanoparticles that are electrochemically, optically and catalytically active and chemically inert, and highly photoluminescence (PL) are of great interest for their potential as alternative to dyes and heavy metal quantum dots in biomedical and energy focused applications [2]. In this research, synthesis of fluorescent carbon nanoparticles from a natural carbon source, carob molasses, was investigated. To this end, thermal synthesis methodology as a green synthesis method with the easiness to carry out and being economical was followed. Different water soluble polymers were used for surface passivation of carbon nanoparticles (e.g. polyethylene glycol (PEG), polyvinyl alcohol (PVA), polyethylene glycol (PEO), chitosan, cholesterol, agar and alginate) and their effect on fluorescent emission from nanoparticles and nanopartlce characteristics were investigated**.** Synthesized fluorescent carbon nanoparticles (FCNPs) were characterized by field emission scanning electron microscope (FE-SEM), XRD, UV spectrophotometer, fluorescence spectrophotometer and dynamic light scattering method. Results showed that surface properties of nanoparticles and fluorescent properties were as a result strongly determined by the properties of passivation agent. Moreover, size of nanoparticles with core diameter measured as 10-15 nm and the hydrodynamic size was found to be varied depending on the polymer type. Carbon nanoparticles being highly biocompatible and fluorescently active could have great potential in several areas including biomedical applications such as nanolabel design for disease detection and bioimaging and /or drug delivery systems and also development of photovoltaic systems and catalysis.

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Keywords: carbon nanoparticles, fluorescence nanomaterial, green synthesis, surface pasivation agent

P-039

PHTHALOCYANINE-BASED PERIODIC MESOPOROUS ORGANOSILICA NANOPARTICLES : EXPECTATIONS AND PRELIMINARY RESULTS

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Nanomedicine is now recognized as promising anti-cancer strategy as it benefits from the EPR (Enhanced Permeation and Retention effect). This is therefore a major research axis in Europe.[1]

On the other hand, Photodynamic Therapy (aka PDT) is cancer treatment modality with numerous advantages over classically used radiotherapy, chemotherapy or surgery. In proved in the recent years to have an even brigher future when photosensitisers are combined or included in nanoparticles.[2-3]

Periodic Mesoporous Organosilica nanoparticles made of porphyrin gave good results so far.[4] We are now involved in the preparation of such nanoparticles based on phthalocyanines, to benefit from their properties particularly suitable for PDT, in particular their maximum intense absorption at NIR wavelengths.

As nanoPMOs are prepared by polycondensation of silylated molecules, themselves obtained by click chemistry, a synthetic tool extremely useful intetrapyrrole synthesis [4], phthalocyanines bearing triple bonds grafted on a resorcinol skeleton were prepared, converted into appropriate silylated derivatives prior to the polycondensation reaction leading to the desired nanoparticles. The characterization and properties of these novel nanoPMOs will be presented.

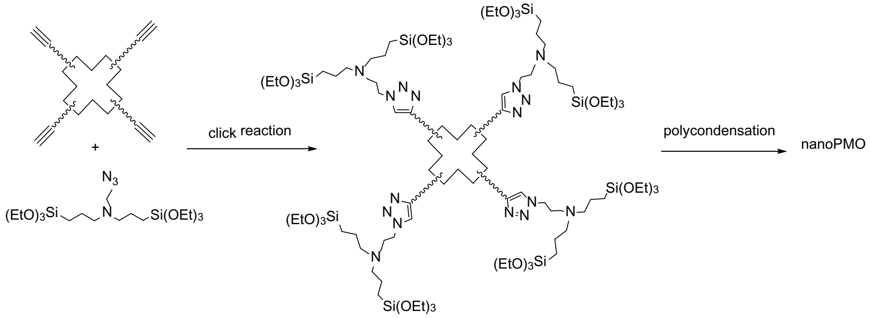

Figure 1: The different steps of the preparation of phthalocyanine-based nanoPMOs.

✚: Zn(II) phthalocyanine

Acknowledgements: The Scientific and Technological Research Council of Turkey (TUBITAK) is gratefully acknowledged (France-Turkey Bilateral PIA-Bosphorus 115Z864).

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Keywords: Phthalocyanine, Periodic Mesoporous Organosilica nanoparticles, Photodynamic Therapy

P-040

PREPARATION AND CHARACTERIZATION OF POLY(N-VINYL PYRROLIDONE) COMPOSITE HYDROGELS CONTAINING HYDROPHILIC NANO SiO_2

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In general, cross-linked polymer that can exhibit the ability to swell in the liquid are defined as gel. When H_2O has been selected as the liquid, gel is called as hydrogel or “aquagel". Gels can absorb H_2O up to thousands of times its own weight. Three-dimensional crosslinked structure is formed in a chemical reaction with the one or more monomers, also it is possible to obtain physical hydrogels via hydrogen bonds and van der Waals interactions [1,2]. Studies related to strengthening polymeric hydrogels and adding different functionalities to them has been focused on combining hydrogels and nanoparticles. Nanoparticles, such as polymeric, ceramic, metallic and carbon-based can be combined with hydrogels to produce nanocomposites having excellent features and tailored functionality [3,4]. The final structure has demonstrated superior physical, chemical, electrical and biological properties.

In order to contribute to these developments, we combined poly(N-vinyl pyrrolidone) (PVP) which is widely used in biology, medicine and pharmaceutical applications, and hydrophilic nano-silica (SiO_2) and we obtained nanocomposite hydrogels. Physical and chemical structures of nanocomposite hydrogels were characterized by using FT-IR, XRD, SEM, TGA and DSC analysis techniques. The physical and chemical properties of the PVP hydrogels containing hydrophilic nano-SiO_2 were compared to considering the PVP hydrogels containing non-hydrophilic nano SiO_2. Significant improvement in the physical properties of PVP hydrogels were provided by adding hydrophilic nano SiO_2. Mechanically and thermally more resistant nanocomposite hydrogels were used for drug delivery studies.

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Keywords: composite, hydrogels, nano silica.

P-041

PREPERATION of 3D COUMARIN–SINGLE WALLED CARBON NANOTUBE HYBRID MATERIALS *via* "*CLICK*" CHEMISTRY

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In recent years, studies on single walled carbon nanotubes (SWCNTs) are increasing rapidly because of its the superior features. The templated method is a powerful approach to create porous carbon materials with a tunable pore size, large specific surface areas and interconnected pore network, making them promising candidates for supercapacitor electrode materials, sensors, hydrogen storage and solar cell materials. Studies are focused to increase its solubility which is poor due to its structure. For this purpose, SWCNTs were modified with different groups such as pyrene, phthalocyanine [1, 2]. This study is aimed to functionalize SWCNTs with coumarin groups using "Click" reaction method to prepare hybrid material for increasing electrochromic, photovoltaic, sensor and optical properties of this material.

SWCNTs was functionalized with coumarin groups as covalently interactions for enhance light collector properties. UV-Vis and computational chemistry was used to estimate the energy band gap of the hybrids. The energy band gap will also estimate using cyclic voltammetry and the positions of both highest occupied molecular orbital (HOMO) and lowest unoccupied molecular orbital (LUMO) were determined.

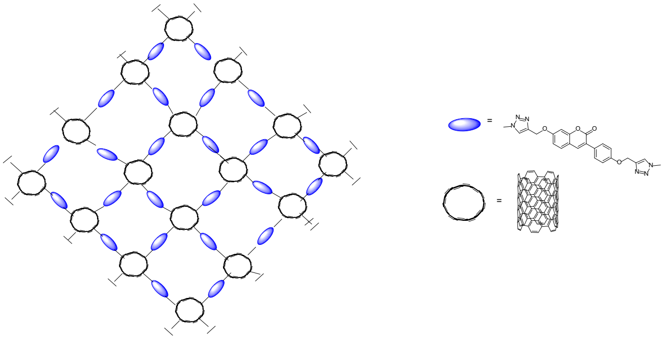

Figure.1: The structures of covalently bonded Coumarin:SWCNTs 3D hybrid materials

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Keywords: single walled carbon nanotube, coumarin 3D nano structure, Click chemistry

P-042

ELECTROSPUN NANOFIBERS FROM FLUORESCENT DANSYL-FUNCTIONAL (POLY(STYRENE-(2-HYDROXYETHYL METHACRYLATE))$_2$-POLY(ETHYLENE GLYCOL) COPOLYMER

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Electrospinning employs electrostatic force to stretch and accelerate a charged polymer solution jet and is capable of producing submicron diameter [1]. Considering the high fiber surface, new chemical and physical characteristics are associated with the fiber surface enabling the production of revolutionary new materials, such as tissue engineering, filtration, enzyme immobilization, and sensors [2].

The dansyl functional group and its derivatives have been drawing wide attention because of their extensive applications [3]. The fluorescence from the dansyl group is relatively insensitive to quenching by oxygen and can be used as a specific fluorescence derivative reagent. Dansyl chloride is therefore an important fluorescence label used mainly in the studies and applications concerning separation, detection and conformation of amino acids, proteins and in the determination of clinical samples [4].

In this work, dansyl-functional (Poly(Sty-HEMA))$_2$-PEG copolymer was synthesized in a three-step procedure combining with atom transfer radical polymerization (ATRP) and nucleophilic substitution reaction. Nanofibers were produced from solution by electrospinning. Chemical structures of the polymers were confirmed by FT-IR and ^{1}H-NMR techniques and relative average molecular weight was determined using Gel permeation chromatography (GPC). The morphological, and photochemical parameters of these fibers were obtained by Scanning Electron Microscope and time resolved fluorescence spectrophotometer.

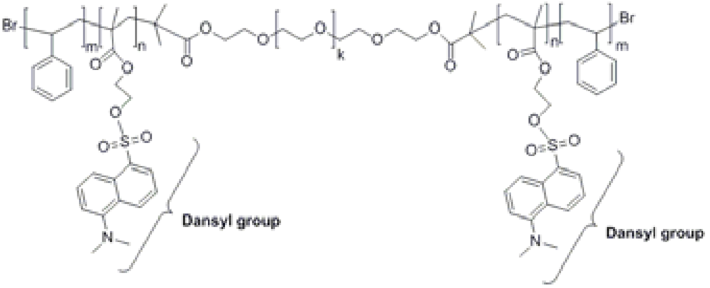

Figure 1: Dansyl-functional (Poly(Sty-HEMA))$_2$-PEG copolymer

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Keywords: Dansyl, Electrospinning, Nanofibers, ATRP

P-046

PREPARATION AND CHARACTERIZATION OF HYDROXYPROPYL METHYL CELLULOSE-GRAPHENE NANOCOMPOSITE FILMS

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In recent years, many researchers have concerned with polymer nanocomposites because of their enhanced properties arising in the presence of nano materials [1]. A diversity of carbon nanomaterials such as carbon nanotubes and graphite nanoplatelets have been used for preparing polymer nanocomposites [2,3]. Currently, graphene has also attracted a great deal of attention through its unique structure and properties [4]. Graphene is the first known two-dimensional material. Graphene is cheap and easy to use, transparent, harder than diamond, stronger than steel, finer than hair. Moreover, it is a very good material for conducting heat and electricity. Nowadays, graphene is used in many areas thanks to these superior properties such as electronic materials, energy storage, sensors and biomedical [5]. Hydroxypropyl methyl cellulose is a biodegradable and biocompatible polymer and widely used for different applications [6]. It is also water soluble. So, we have chosen HPMC for preparing nanocomposites films with graphene [7].

In this study, we prepared hydroxyproply methylcellulose-graphene nanocomposite films in a different weight ratios. Nanocomposite films were characterized by SEM, XRD, EDX, FT-IR and TGA methods. It has been observed that the results are in accord with literature.

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Keywords: Nanocomposite films, Graphene, Hydroxypropyl methyl cellulose

P-047

ZINCPHTHALOCYANINE AS POTENTIAL FLUORESCENCE/NUCLEAR İMAGİNG AGENT FOR CANCER CELL*

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Phthalocyanines are macroheterocylic compounds having 18 π electron system and synthetic analogues of the naturally occuring porphyrins. The electronic absorption spectrum of phthalocyanines shows two main bands, the Q-band and the Soret or B-band. The Q-Band, associated to π-π* HOMO-LUMO transition, is usually found in the near-IR region. Apart from their thermal and chemical stability, their extended photo response at 600-800 nm, where the photons flux is maximum, make them perfect light-harvesting systems and ideal components for various applications in many research fields such as organic solar cells, photodyanic therapy, light-emitting diodes, nonlinear optics, and supramolecular chemistry [1].

In this context, a near IR absorbing phthalocyanine bearing four binaphtyl group has been synthesized in order to investigate its cytotoxicity and intracellular uptake of sensitizer on MCF-7 (human breast cancer), MDAH (ovarian cancer), HeLa (human epitheloid cervix carcinoma), EMT-6 (mouse breast cancer) and WI-38 (human fibroblast lung) cell lines. ZnPc showed four-time higher intracellular uptake in carcinoma cells (MCF-7) than normal (WI-38) cell lines. With the aim of studying in detail the biodistribution feature and tumor nuclear imaging capacity, ZnPc was also labeled with I-131. The efficiency of radiolabeled compound was 95±4.6%. In addition, ZnPc reveals to be very efficient singlet oxygen generators (ΦΔ= 0.612 in DMSO) and promising PSs for PDT application [2].

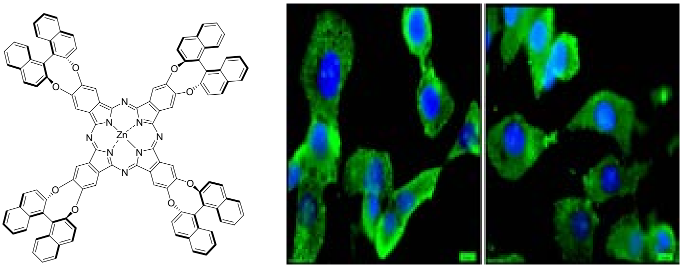

***Figure 1*:** Molecular structure of ZnPc and images of ZnPc in MCF-7 cells.

Acknowledgements: This work has been supported by The Scientific and Technological Research Council of Turkey (TUBİTAK). (Number of Project: 114Z430).

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Keywords: Photodynamic Therapy,Zincphthalocyanine, Fluorescence/Nuclear İmaging Agent

P-048

SYNTHESIS OF COPPER NANOPARTICLES USING A DIFFERENT METHOD: DETERMINATION OF ITS ANTIOXIDANT AND ANTIMICROBIAL ACTIVITY

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In recent years, most of the scientific work carried out has aimed to contribute to green chemistry. Therefore, economical and environmentally friendly methods have been developed. Today, another rising value is nanotechnology. Therefore green nano synthesis is a very important issue study combining these two values. Some researchers use plant extracts, enzymes, carbohydrates and microorganisms (bacteria, fungi and yeast) for green nano synthesis [1]. Therein, plant extracts are outstanding for highly efficient in green synthesis of nanoparticles and in terms of being economical and environmentally friendly (Marshal and Haverkamp [2].

Figure 1. Fig (*Ficus carica*)

For these reasons, fig plant, having a varied in terms of plant peroxidase, was selected in this research (Figure 1.) Fig plants grow abundant in our country and are quite specific plant due to the components and enzymatic contents. 500 mg/mL of partially purified plant enzyme from Fig (*Ficus caricas*) was added in sample of copper chloride solution ($CuCl_2$) (10 mL, 10 mM) and incubated in a closed space for 4 hours. Synthesized copper nanoparticles were characterized with scanning at range of 200-1000 nm by using UV-VIS and FTIR spectrophotometer. Determination of topography copper nanoparticles was performed by SEM (Scanning Electron Microscope). From the obtained results, copper nanoparticles have Fe^{3+}-Fe^{2+} reducing (FRAP) activity, Cu^{2+}-Cu^{+} reducing activity, superoxide anion radical ($O_2^{\bullet -}$) removal activity, The $ABTS^{\bullet +}$ scavenging activity and hydrogen peroxide radical scavenging activity. Also, copper nanoparticles have been shown antimicrobial activity.

As a result; obtained copper nanoparticles from our experiments are thought to be used in many areas such as chemistry, health and construction due to their antimicrobial and antioxidant properties.

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Keywords: Copper Nanoparticles, Green synthesis, Fig (Ficus carica), Antioxidant and antimicrobial activity

P-049

OPTICAL PROPERTIES OF Al:ZnO THIN FILM DEPOSITED BY DIFFERENT SOL-GEL TECHNIQUES: ULTRASONIC SPRAY PYROLYSIS AND DIP-COATING

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Undoped and Al-doped ZnO polycrystalline thin films have been fabricated on glass substrates using dip coating (DC) and ultrasonic spray pyrolysis (USP) systems. In the DC system, computer-controlled dipping and withdrawing speeds of the substrates were 1 cm/min with a holding time of 30 s between the dipping and withdrawing periods. The dipping and withdrawing cycles were successively repeated two times. Instead of putting the sample in the furnace after the deposition, substrate is moved to center of the furnace with same speed in each cycle. That is why, substrate is exposed to temperature gradient. As a result, considereably changes were observed in the optical transmission spectra of the films. In USP system, the substrate temperature was kept at 400°C. The concentration of zinc acetate and Al/Zn ratio in the solution were kept constant as 0.05 M and 2 at. %, respectively. The optical properties were compared between two different techniques. The optical transmission of Al:ZnO/glass/Al:ZnO sample and the optical transmission of Al:ZnO/glass sample were determined higher than 80% in the visible and near infrared region for DC and USP deposition techniques, respectively. Optical transmittance spectrum of the films in the forms of film/glass/film and film/glass were used to determine the film thickness and optical band gaps. The optical band gaps of Al doped ZnO films onto glass substrate are increases with increase of Al content and the absorption edge shifted to a shorter wavelength (blue shift) compared with the undoped ZnO thin film.

Acknowledgements: This study was supported by The Scientific Research Unit of Mehmet Akif Ersoy University with number of projects 110-NAP-10, 100-NAP-10,172-NAP-13, 173-NAP-13, 0324-NAP-16 and 0356-NAP-16.

Keywords: Al doped ZnO, thin film, dip coating, ultrasonic spray pyrolysis, optical transmission.

P-050

SYNTHESIS OF KERATIN-BASED BIOCOMPOSITE

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Chicken feather is a valuable raw material since it contains 91% keratin in its structure [1]. Keratin fibers from feathers have some important feature like; eco-friendly, biodegradable, nonabrasive, insoluble in organic solvent and also have good mechanical properties, low density, hydrophobic behavior and low cost. Thus, eco-friendly and biodegradable property is leads to useable material in the development of green composites [2, 3]. Keratin is a biopolymer which is consist of amino acid sequences. The amino acids have functional groups. Such as, -NH, OH and -SH. Recovered keratin can be modified with this functionality.

On the other hand, poly(N-vinyl-2-pyrrolidone) has received increasing attention as a material for numerous applications in medicine applications in medicine and pharmaceuticals because of its ability to bind reversibly to various molecules in solution while maintaining excellent biocompatibility with the human body. The other polymer, poly(methyl methacrylate) is one of the best polymeric materials broadly used for insulation devices manufacture. Its electrical properties are highly influenced by many environmental parameters such as temperature, mechanical constraints, and humidity, also has a good degree of compatibility with human tissue [4].

The goal of this study is to combine the advantages of natural and synthetic polymers to obtain new composite materials via grafting reactions of methyl methacrylate and N-vinyl-2-pyrollidone on keratin. Firstly keratin which is recovered from chicken feather, then modified via graft copolymerization with methyl methacrylate and Nvinyl-2-pyrollidone in a aqueous medium, presence of Ce(IV) ammonium nitrate/HNO_3 redox system. The effect of keratin, monomer, Ce(IV) ammonium nitrate, HNO_3 concentrations on the polymer yield were investigated. The effect of reaction temperature and time on the yield was also investigated. Finally, in situ polymerization of hydroxyapatite 1%, 3% and 5% in weight respectively obtained keratin-graft-poly(N-vinyl-2-pyrrolidone-co-methylmethacrylate) polymer.

Acknowledgements: This study was supported by Research Fund of Istanbul Technical University, Turkey (Project No: 38465)

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Keywords: recovered keratin, poly(methylmethacrylate), poly(vinylpyrollidone), hydroxyapatite, redox polymerization

P-051

INVESTIGATION OF OPTICAL PROPERTIES OF SUBSTITUTED Fe(II)Pc

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Phthalocyanine is an intensely blue-green-coloured aromatic macrocyclic compound that is widely used in dyeing[1,2,3]. Phthalocyanines form coordination complexes with most elements of the periodic table. These complexes are also intensely colored and also are used as dyes or pigments. Substituted iron (II) phthalocyanine was synthesized and characterized and its optical properties were investigated. Absorption graphic of substitued Fe(II)Pc sample dependent on energy gap is given in Figure 1.

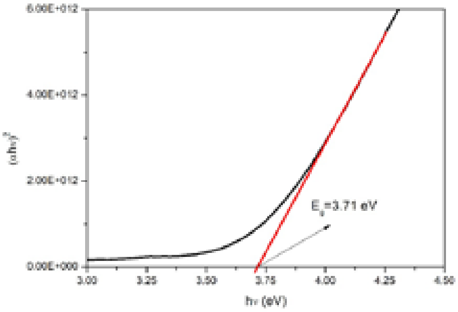

Figure 1: Absorption Graphic of Substitued Fe(II)Pc Sample Dependent on Energy Gap

Acknowledgements: This study was supported by BTÜBAP-2010-FED-1 project.

References:

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Keywords: Absorption graphic, Band Gap, Optical Property, Substitued Fe(II)Pc

P-052

SUBSTITUTED IRON (II) PHTHALOCYANINE

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Phthalocyanine is an intensely blue-green-coloured aromatic macrocyclic compound that is widely used in dyeing[1,2,3]. Phthalocyanines form coordination complexes with most elements of the periodic table. These complexes are also intensely colored and also are used as dyes or pigments. Substituted iron (II) phthalocyanine was synthesized and characterized. Synthesis scheme of substituted iron(II) phthalocyanine is given in Figure 1.

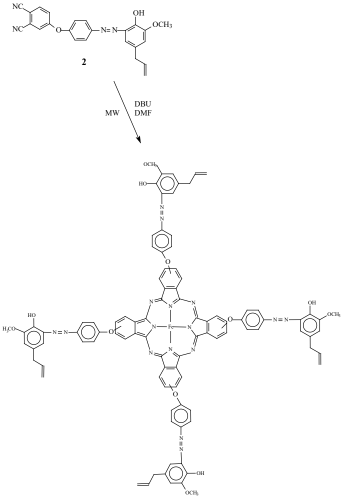

Figure 1: Synthesis Scheme of Substituted Iron(II) Phthalocyanine

Acknowledgements: This study was supported by BTÜBAP-2010-FED-1 project.

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Keywords: Characterization,Functional Phthalocyanine, Synthesis

P-053

SYNTHESIS AND CHARACTERISATION OF $CA_3WO_6:DY^{3+}$ PHOSPHOR AND INVESTIGATION OF ITS LUMINESCENCE PROPERTIES

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Earth Alkaline Orthotungstate compounds has been intensively investigated because of their thermal stability and interesting physical properties [1-3]. The Phosphor, $Ca_3WO_6:Dy^{3+}$, was synthetised by solid state reactions of precursor compounds at high temperatures [3]. As precursor were chosen $CaCO_3$, WO_3 ve Dy_2O_3 compounds. For the synthesis of phosphor, the mixture of appropriate proportions of the precursor compounds were dried, then grounded finely, after that heated at 1350 °C for 5 h long. The structural characterization of prepared compound was carried out by x-ray powder diffraction technique. Powder diffraction patterns showed that phosphor has been identified as $CaWO_6$ (JCPDS: 22-0541) with a monoclinic unit cell and $P2_1/n$ space group, cell parameters are a=551, b=581, c=800 pm and β= 90,205° values

The excitation and emission spectra of $Ca_3WO_6:Dy^{3+}$ was investigated by using luminescence spectrophotometer. In the excitation spectrum, was observed a broad and intensive charge transfer band at 296 nm (see figüre) which belongs to $CaWO_{6\ \mathrm{phase}}$. On the other hand, in the emission spectrum they were two intensive bands at 485 and 576 nm which belong to $^4F_{9/2}\rightarrow{}^6H_{15/2}$ ve $^4F_{9/2}\rightarrow{}^6H_{13/2}$ transition of Dy^{3+} ion, and beside these was also observed very weak bands between 650 abd 800 nm belongs also to $^4F_{9/2}\rightarrow{}^6H_j$ (j=11/2, 9/2) trasnsition of Dy^{3+} ion [4].

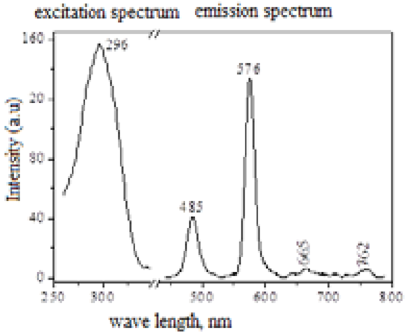

Figure 1: The exitation and emission spectra of $Ca_3WO_6:Dy^{3+}$ phosphor.

Acknowledgment: This work was founded financially by scientific reaserach foun of Mersin University (Project Number: BAP-FBE KB (RA) 2013-2 YL)

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Keywords: Calcium orthotungstate, luminesence spectra, solid state synthese

P-054

NOVEL ACRYLONITRILE DERIVATIVES HAVING PHOTOVOLTAIC PERFORMANCE

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Essentially all methods of energy production-e.g., fraction, damming, drilling, nuclear fission, and excavation of rare elements for photovoltaics-are associated with enviromental degradation. Organic solar cells (OSCs) are regarded as low cost and potentially environmentally benign sources of power [1]. For this purpose, a number of π-conjugated (semiconducting) polymers and many derivatives of organic small molecules have been synthesized for use in the solar cells so far. Design and synthesis of novel soluble acceptor type molecules for photovoltaic use are of great interest. Polymer or small molecule acceptors have several advantages such as well absorption in the visible region and a higher LUMO energy level than PCBM (Phenyl C_{61} butyric acid methyl ester) which in turn leads to a high open circuit voltage (V_{oc}) [2,3].

In this study, we synthesized novel soluble n-type organic molecules which contain furan, thiophene and benzene rings with electron withdrawing cyano groups and investigated their photovoltaic properties (Figure 1).

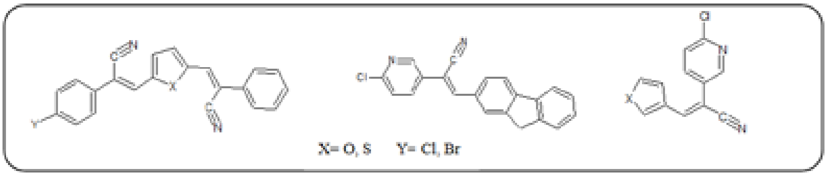

*Figure 1 :*The structures of synthesized n-type molecules

These type diarylacrylonitrile structures were synthesized to investigate their capacity in the solar cells as acceptor for the first time. Optical, morphological and photovoltaic properties of these novel compounds were thoroughly investigated. We achieved high V_{oc} which is higher than that of the conventional bulk heterojunction organic solar cells comprising of P3HT (Poly(3-hexylthiophene-2,5-diyl)) and PCBM.

Acknowledgements: We are thankful to Assist. Prof. Dr. Halil Gokce, (Giresun University) for providing Gaussian 09W program.

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Keywords: Acrylonitriles, Photovoltaics, Solar Cells

P-055

SYNTHESIS, CHARACTERIZATION AND THEIR APPLICATIONS OF ASYMMETRIC VINYL DERIVATIVES

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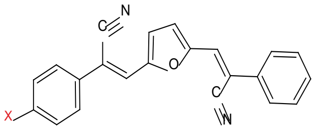
Today, renewable energy resources, such as wind, solar, hydropower, geothermal, hydrogen and biomass/biofuel, have been positively used to give a strong contribution to power generation without increasing environmental pollution [1]. Nowadays, the solar energy is one of the most investigated subject for energy production.

Two main strategies for converting solar energy into useful energy can be mentioned. Firstly, photothermal converters transform light into heat, which can be applied for domestic heating or warm water production. Secondly, photovoltaic devices or solar cells can be used to directly produce electricity from sunlight [2].

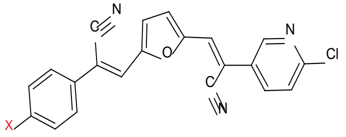
Until now, great progresses have been achieved in producing technologies of solar cells and research and development studies were carried out to reduce the cost and thickness of the used material. The efficiency of produced solar cells is required to meet the cost of its production. Despite the use of inorganic solar cells increases over the years, this increase was unable to obtain the desired acceleration due to the very high production and raw material costs. In order to decrease this disadvantage, there is an orientation towards the use of cheaper organic materials instead of the high cost inorganic materials. For this reason researchers started to move their works extensively towards materials which can be used in organic solar cells.

An organic solar cell is a photovoltaic device whose active layer comprises π-conjugated polymers and small molecules. The conjugated organic compounds including nitrile groups have strong donor- acceptor group for organic solar cells. It seems increasingly that organic photovoltaics will play a role in the future global demand for energy [3].

In this study, nitrile substituted vinylic compounds (Type 1 and Type 2) which contain different homo- and heteroaromatic groups were synthesized for using photovoltaic devices.



(Type 1)



(Type 2)

The new compounds were characterized by IR, ^{1}H-NMR, LC-MS data. Moreover, in this study, molecular structure and HOMO-LUMO energies of compounds were investigated. Especially, substitution of chlorine with bromine atoms in the structure was compared for photovoltaic properties applications. According to the obtained results, these small molecules were found to have high photovoltaic performance.

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Keywords: vinylic compounds, nitrile groups, organic solar cell

P-056

GLYCEROL CARBONATE AND POLYETHYLENE GLYCOL CONTAINING BORATE ESTER POLYMER ELECTROLYTE MEMBRANES

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The need for energy storage is increasing every day as the technology progress. Lithium-ion and lithium-polymer batteries are the prominent and widely used types of batteries for energy storage. The use of polymers instead of the organic solvents results in more reliable batteries. In addition, the problem of capacity fading with time in lithium-ion battery is much less significant for lithium-polymer batteries.

Besides the other industrial use, borate esters have attracted attention in recent years as polymer electrolyte. These examples include the use of borate esters as additives in especially poly ethylene glycol based polymers. However, limited number of studies exists where borate esters are directly used as the polymer electrolyte [1].

In this study, new polymer electrolyte membranes containing glycerol carbonate units, which contains the structure of most commonly used organic battery solvent (ethylene carbonate), has been synthesized. For this purpose, PEG-1000 and glycerol carbonate were reacted with boric acid in a proper stoichiometric ratio to maintain the crosslinking and the polymer electrolyte membranes were prepared as shown in Figure 1. The electrochemical properties of the polymer electrolyte membranes were investigated using different lithium salts ($LiClO_4$, CF_3SO_3Li and $(CF_3SO_2)_2NLi$). The optimum room temperature ionic conductivity were measured for the membrane with $(CF_3SO_2)_2NLi$ as 4.09 x10^{-5} S/cm.

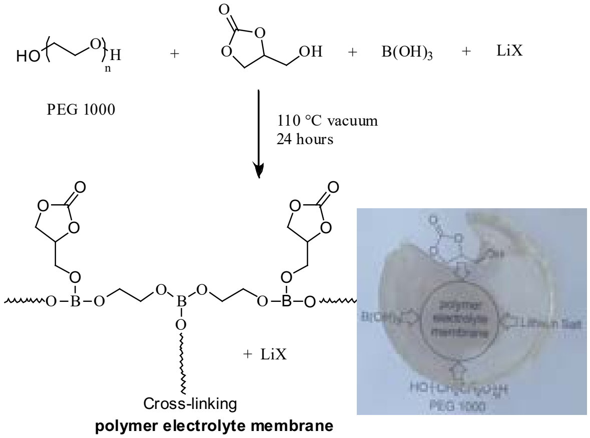

Figure 1: The representative syntheses of the polymer electrolyte membranes with a photo of a membrane sample.

References:

[1] Wakihara, M.; Nakayama, M.; Kato, Y. "Lithium Ion Rechargeable Batteries", (Wiley) **2010**, 213-255.

Keywords: borate ester, polymer electrolyte, membrane, battery

P-057

PERVAPORATION SEPARATION OF BIOBUTANOL USING IONIC LIQUID BASED POLYMERIC MEMBRANES

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Biobutanol is a second generation alcoholic fuel with a high energy density. The separation of butanol (BuOH) from aqueous fermentation broth is a challenging isssue and pervaporation is an efficient membrane based separation technique to recover the butanol from the aqueous mixtures. The crucial concern in pervaporation is to develope preferentially selective membranes for the compound to be separated. In this study highly selective membranes were developed for the butanol recovery from aqueous mixtures.

Ionic liquid (IL) based membranes were prepared by two methods; inclusion of IL in a host polymer matrix and inclusion of IL by double sided silicone coating [1]. The ionic liquid used in this work was [bmim][Tf_2N] (1-Butyl-3-methylimidazoliumbistrifluoromethylsulfonylimide). In the first method IL was blended with polydimethylsiloxane and coated as an active layer onto porous hydrophobic PTFE support layer. In the second method IL was impregnated into the pores of the PTFE layer under vacuum application. Then this IL impregnated membrane was dipped into the PDMS solutions, then crosslinked by heat treatment yielding a double side coated membrane. Thus ionic liquid was immobilized in the pores of the support layer between the PDMS layers.

The butanol sorption characteristics of PDMS-IL blending membranes were investigated in a previous work [2] and it was concluded that these blendings have promising selectivity properties for BuOH recovery from aqueous mixtures. In this study pervaporation separation of BuOH from aqueous mixtures using these IL-PDMS blending membranes was carried out at various concentrations in the range 1-5% (wt) BuOH. High selectivities were achieved in the range of 24-76 and these results were found to be higher than those of other IL based membranes reported in the literature. The pervaporation experiments indicate that [bmim][Tf2N] included PDMS based membranes have a great potential for BuOH separation from aqueous mixtures.

References:

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[2] Ayça Hasanoğlu (2015) : Investigation of sorption characteristics of polymeric membranes containing ionic liquids for n-butanol recovery from aqueous streams, Desalination and Water Treatment, DOI : 10.1080/19443994.2015.1010234

Keywords: ionic liquid, PDMS, pervaporation, butanol

P-058

NOVEL GRAPHENE OXIDE-CARBON FIBER HYBRID ELECTROCATALYSTS FOR FUEL CELL APPLICATIONS

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For designing an efficient fuel cell catalyst, high surface area becomes an important issue for doing interaction of metal catalyst with O_2 molecules. This goal has to be realized by dispersing catalyst phase in a conductive support material which usually being used carbon [1]. The utilization of nano-structured carbonaceous materials as support present as promising solution for fuel cells. However, for enhancing the catalytic activity and stability is to increase the interaction between Pt and its supports, in order to inhibit the tendency of Pt nanoparticle coalescence [2].

A novel synthesis method is developed in order to have an efficient electrocatalyst for using in fuel cell applications. Graphene oxide and carbon fiber (trade name GAqua [3]) together with Pt salt are synthesized in microwave oven. Graphene oxide and Pt^{4+} are reduced in one step during microwave process. For comparing, we also tried hydrothermal treatment. On the other hand, three different reducing agent are utilized for efficient reduction. An XRD and Raman spectra (Figure 1) are illustrated for indicating Pt and Graphene oxide reduction.

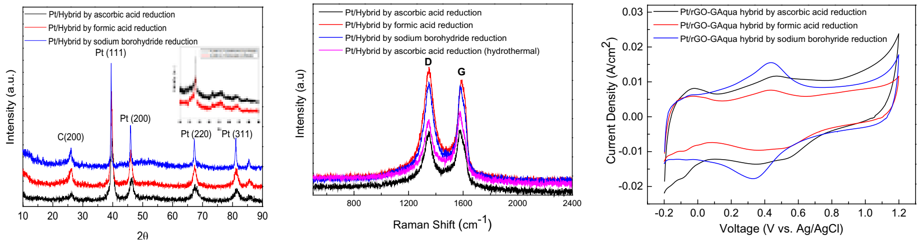

Figure 1: XRD and Raman spectra and the CV of the samples

Cyclic voltammograms (CVs) were obtained with a potential scan for a range of -0.2 to 1.2 V in 30 min N_2 purged in H_2SO_4 solution vs. Ag/AgCl reference electrode. Figure 1 shows the characteristic peaks of the formation and reduction of Pt oxide. Between -0.2 to 0 V region, typical hydrogen adsorption and desorption peaks from polycrystalline Pt are observed using carbon base supports. The amounts of the Pt catalyst in these electrodes are maintained at 24.5 μg cm^{-2}.

Acknowledgements: The It is gratefully acknowledged that this research has received funding from the European Union Seventh Framework Programme under grant agreement n°604391 Graphene Flagship.

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[2] J. Wang, et.al., J. Mater. Chem., **2011**, 21, 12195.
[3] GAquA is a registered and Trademark of Grupo Antolin Ingenieria SA, Spain.

Keywords: Carbon Fiber, Electrocatalyst, Fuel Cell, Graphene, Hybrid

P-059

HIGH TEMPERATURE SYNTHESIS AND PHOTOLUMINESCENCE PROPERTIES OF $Dy_{1.90}In_{0.10}Zr_2O_7$ PYROCHLORE TYPE PHOSPHOR

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There are much of interest to research and use in the different properties and behavior of pyrochlore oxides of the type $A^{3+}{}_2B^{4+}{}_2O_7$ where A site is a rare-earth ion and B site is usually a transition metal. The rare earth pyrochlore compounds have also considerable photoluminescence characteristics. In this study, rare-earth pyrochlore $Dy_{1.90}In_{0.10}Zr_2O_7$ was synthesized through a high temperature solid state reaction method under open atmosphere. The thermal analysis (DTA/TG) were carried out to determine phase forming process condition. The crystal structure of the sintered sample were characterized by X-ray powder diffraction (XRD). The main diffraction peaks are indexed according to the 01-074-9311 PDF card number. The results of the structural analysis give the cubic crystal system with a=b=c=10.335 Å and α=β=γ=90° lattice parameters. The photoluminescence (PL) properties were analyzed to obtain excitation, emission (Figure 1) and decay time properties by using a photoluminescence spectrometer under room temperature. The PL investigations proved an excitation maximum at 291 nm which is due to $^6H_{15/2} \rightarrow {}^4K_{13/2} + {}^4H_{13/2}$ transition of Dy^{3+} ions and two emission maximums at 484 nm and 523 nm which belong to $^4F_{9/2} \rightarrow {}^6H_{15/2}$ and $^4F_{9/2} \rightarrow {}^6H_{13/2}$ transitions of Dy^{3+} ions, respectively.

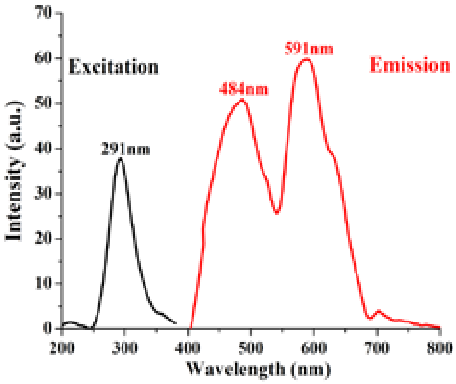

Figure 1: The excitation and emission spectrum of $Dy_{1.90}In_{0.10}Zr_2O_7$ phosphor.

Acknowledgements: The authors would like to thank TUBITAK (The Scientific And Technological Research Council Of Turkey) for the support to the project numbered 114Z438.

Keywords: photoluminescence, differential thermal analysis (DTA), powder diffraction.

P-060

ELECTROPOLYMERIZATION OF TRANSITION METAL COMPLEXES OF SCHIFF BASES ON PLATINUM ELECTRODE AND INVESTIGATIONS OF THEIR ELECTROCATALYTIC ACTIVITY

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The complexes of copper (II) and nickel (II) with N,N'-bis (salicylidene)-1,2-ethylenediamine was synthesized and their structures elucidated by spectroscopic methods. The results showed that the ligand coordinated to the Cu(II) and Ni(II) ion through the azomethine nitrogen and phenolic oxygen atoms. Electropolymerization studies were complexes [CuL] and [NiL] (5.0×10^{-3} M) by cyclic voltammetry [1, 2]. The solutions were purged with nitrogen to remove oxygen before measurement. These experiments were conducted in acetonitrile solution containing $LiClO_4$ (0.1 M) as supporting electrolyte with repeated scans between 0 and 1.6 V versus Ag/AgCl at a scan rate 50 mV s^{-1}. The oxidation of methanol has also been investigated. Cyclic voltammograms of a bare platinum electrode and a modified platinum electrode with poly-CuL and poly-NiL in a solution 0.1 M KOH and 0.1 M methanol [3]. The stable adherent film electrodeposited showed good electroactivity.

Acknowledgements Author thank to Niğde University Scientific Research Projects Unit (NUBAP, Project No: BAGEP 2013/36) for their financial support during this study.

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Keywords: Electropolymerization, Modified electrode, Schiff base

P-061

ZnO NANOPARTICULATE THIN FILM: USING *CITRUS RETICULATA PEEL* EXTRACT

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Nanoparticles posses the unique size dependent property known as high aspect ratio, which is the ratio of the surface area to volume. Smaller the size of the particles greater will be the aspect ratio i.e., greater surface area compared to their volume [1]. This increased surface area of the smaller nanoparticles enhances the reactivity of the nanoparticles (NPs). Several physical and chemical procedures have been used for the synthesis of large quantities of metal oxide-NPs. Chemical methods lead to the presence of some toxic chemicals adsorbed on the surface that may have adverse effects in medical application [2]. Currently, plant-mediated biological synthesis of NPs is gaining importance due to its simplicity, eco-friendliness. Among the metal oxide NPs, zinc oxide (ZnO) is interesting because it has vast applications in various areas such as optical, piezoelectric, magnetic, and gas sensing [3].

In this work, ZnO-NPs was produced using *Citrus reticulata* peel extract, and then the NPs were coated on a microscope slide via ultrasonic spray pyrolysis (USP) system. *Citrus reticulata* peel has phenolic compounds. The produced thin film was characterized using XRD, FEG-SEM, four point probe method and Uv-vis spectrophotometry.

The XRD patterns were indexed on basis of a hexagonal (wurtzite) and the pattern indicate high crystalline quality with very well defined peaks and intense (figure 1.a). FEG-SEM image confirms the formation of nanoparticles and the average grain sizes were calculated to be 25 nm (Figure 1.b). The electrical conductivity increases with measurement temperature, indicating semiconducting behaviour for the ZnO thin films (figure 1.c).

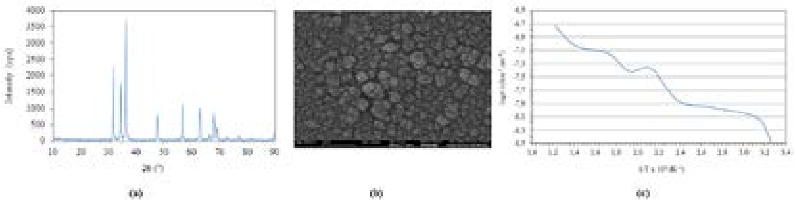

Figure 1: (a) XRD pattern, (b) FEG-SEM Image, (c) Electrical conductivity of ZnO-NPs.

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Keywords: ZnO, THIN FILM, CITRUS RETICULATA PEEL EXTRACT

P-062

HYDROLYSIS OF (CHLOROMETHYL)ETHYLENE CARBONATE TO PRODUCE EPICHLOROHYDRIN IN THE PRESENCE OF IONIC LIQUIDE AS CATALYST

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Cyclic carbonates are used as polar aprotic solvents in cleaning, cosmetics and personal care products, as electrolytes in lithium secondary batteries, as precursors for the formation of polycarbonates, and as intermediates in the production of pharmaceuticals and fine chemicals [1]. In recent years room temperature ionic liquids have attracted increasing interest in the area of green chemistry [2]. Ionic liquids widely investigated and are used in such applications, organic synthesis, enzymatic catalysis, separation processes etc. These have remarkable properties such as low vapor pressure, excellent chemical and thermal stability, the potential recoveries and re-use [2]. Epichlorohydrin (ECH) is an organochlorine compound and an epoxide. ECH is a highly reactive compound and is used in the production of glycerol, plastics, epoxy glues and resins, and elastomers. In contact with water, ECH hydrolyzes to 3-MCPD (3-monochloropropane-1,2-diol or 3-chloropropane-1,2-diol), a carcinogen found in food.

3-MCPD is an organic chemical compound which is carcinogenic and highly suspected to be genotoxic in humans, has male anti-fertility effects, and is a chemical byproduct which may be formed in foods, the most commonly found member of chemical contaminants known as chloropropanols.

In this study, hydrolysis of cyclic carbonate, 4-(chloromethyl)- 1,3-dioxolan- 2-one (ECHC) to form 3-chloropropane-1,2-diol was investigated. However, it was found out not only 3-chloropropane-1,2-diol but also ECH as reaction product.

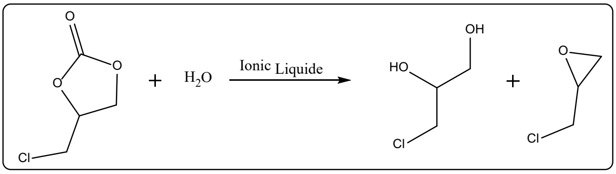

Figure 1: The cracking of ECHC

We studied the hydrolysis of cyclic carbonate as reported in the literature [3]. Similarly, (bmim)PF$_6$ (1-butyl- 3-methylimidazolium hegzafluorophosphate) was used as catalyst for the hydrolysis of ECHC to produce 3-chloropropane-1,2- diol. Interestingly, ECH was detected with the LC-MS as second product. This phenomenon was not reported earlier.

Acknowledgements: This work was supported by the TUBITAK (TBAG Project No: 110T655) and HUBAK (Project No's: 12123, 12058 and 12158)

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Keywords: Cyclic carbonate, Epichlorohydrin, Diol

P-063

SYNTHESIS AND CHARACTERIZATION OF FERROCENYL BASED BIS(PHOSPHINITE) LIGANDS AND APPLICATION OF THEIR Ru(II)-BENZENE COMPLEXES IN ASYMMETRIC CATALYSIS

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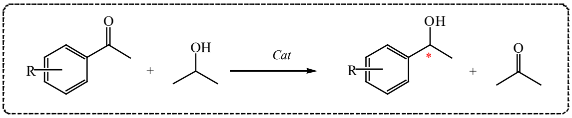
Over the past few decades, a large number of chiral bidendate phosphorus containing ligands with a C_2-symmetrical structure or bearing two closely related bindings sites have been widely studied [1,2]. Among the recently developed efficient transition metal-based chiral reduction catalysts, the C_2-symmetric ferrocenyl-phosphinites are notable [3,4]. In general, asymmetric hydrogenation is mediated by a complex bearing Rh, Ru or Ir, among them ruthenium catalysts attracted considerable interest. One of the reasons is that the Ru catalysts have excellent performances. Another reason is that Ru enjoyed a cost advantage relative to other asymmetric hydrogenation metals [5].



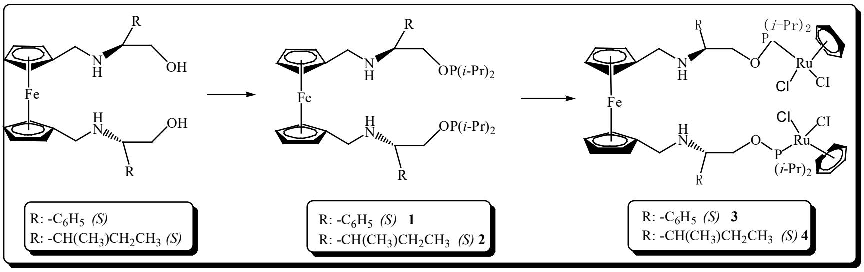


Figure 1 Syntheses of the compounds **1-4**

In present study, ferrocene containing bis(phosphinite) ligands (**1**,**2**) and their Ru(II)-benzene complexes (**3**,**4**) were synthesized. The complexes were characterized by several spectroscopic techniques. It was found that the complexes **3** and **4** are efficient catalytic system for the asymmetric transfer hydrogenation of acetophenone derivatives and lead to secondary alcohols from good to excellent yields.

Acknowledgement: This study was supported by Dicle University Research Fund (**FEN.15.023**).

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Keywords: Catalysis, Bis(phosphinite), Asymmetric Transfer Hydrogenation

P-064

CHIRAL IMINE BASED Ru(II)-BIS(PHOSPHINITE) COMPLEXES AND INVESTIGATION OF THEIR CATALYTIC ACTIVITY

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Over the last decades, a large number of C_2-symmetric chiral bidendate phosphorus ligands were widely studied [1]. Because C_2-symmetry reduces the number of possible catalyst-substrate arrangements and, consequently, the number of competing reaction pathways by a factor of two, which can be an important factor in enantioselectivity [2]. Considering advantage of both C_2-symmetrical ligands and phosphinites often give high levels enantioselectivity in asymmetric reactions [3], in recent years our research group has reported the synthesis [4], characterization and coordination properties of this kind of ligands [5].

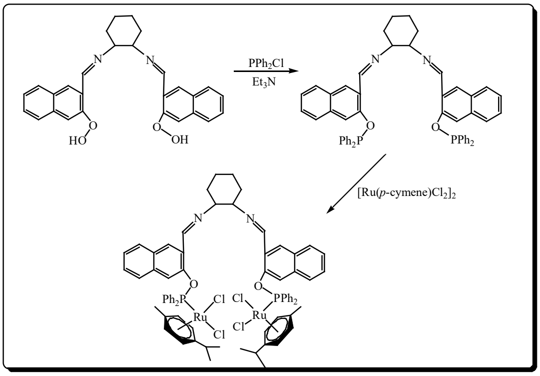

Figure 1. Chiral imine based Ru(II)-phosphinite complex

We have synthesized new ruthenium(II) complexes of C_2-symmetric bis(phosphinite) ligands containing imine moiety and used them as catalysts in ruthenium-catalysed asymmetric transfer hydrogenation of acetophenone and ıts derivatives.

Acknowledgement: This study was supported by Dicle University Research Fund (project number: **14-FF-137**).

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Keywords: Imine, Phosphinite, Ru(p-cymene), Asymmetric Transfer Hyfrogenation

P-065

ONE-POT SYNTHESIS OF METAL OXIDE NANOPARTICLES-GRAPHITIC CARBON NITRIDE NANOCOMPOSITES AS EFFICIENT CATALYSTS FOR THE DEHYDROGENATION OF AMMONIA BORANE

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Hydrogen is raised as an efficient energy carrier owing to its favorable properties and the technological/scientific developments as well as renewable energy sources in the last decade [1]. In this regard, hydrogen has already been used as energy carrier in fuel cells, portable devices and vehicles [2-4]. However, the safe storage and delivery of hydrogen are still ongoing problems in front of it's widely usage. The chemical hydrogen storage that stores hydrogen in a chemical compound via covalent bond is a promising solution to the problem. Ammonia borane (H_3NBH_3, AB) has been studied as a good candidate for chemical hydrogen storage media in recent years. AB can only release hydrogen in the presence of a suitable catalyst either in aqueous solution or organic solution. The hydrolysis of AB is more convenient route considering the practical applications in the onboard systems [5].

In this study, we report the in-situ synthesis of metal oxide-graphitic carbon nitride nanocomposites (MO-g-C_3N_4) and their catalysis in the hydrolysis of AB. The MO-g-C_3N_4 was prepared for the first time from the thermal decomposition of metal precursors and guanidine chloride in a quartz furnace at high temperature. As-prepared MO-g-C_3N_4 was characterized by TEM, SEM, EDX, XRD and ICP-MS. The detailed kinetics of hydrogen generation from the AB hydrolysis catalyzed by MO-g-C_3N_4 was studied depending on catalyst and substrate amount as well as the temperature.

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Keywords: Metal oxide,nanocatalysts,dehydrogenation,graphitic carbon nitride

P-066

SYNTHESIS OF VERSATILE FLUORESCENT CALIX[4ARENES AND THEIR APPLICATION IN THE LIPASE-CATALYZED ENANTIOSELECTIVE REACTIONS

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Calixarenes a well-known class of polyaromatic macromolecules have been employed as three dimensional molecular building blocks for the construction of more elaborate host molecules with convergent binding groups and desired properties mainly for the attraction of simple cations, anions, and small molecules [1]. There are numerous examples of calixarene based molecules that can act as hosts and could take a prominent place such as development of mimic biocatalysts, enhancing catalytic activity and enantioselctivity of enzymes, and providing organic/water solubility to the reagents for several enzyme-dependent biological reactions [2]. In this regard we have plan new strategy by using fluorescent calix[4]arene derivative containing dansyl moiety for its use in catalytic reactions[3]. First synthesized calix[4]arene flourescent compound was immobilized with Fe_3O_4 magnetic nanoparticle to improve its catalytical activity, after *candida rugosa* lipase was encapsulated to test enanioselectivity in the hydrolysis reaction of racemic flurbiprofen methyl ester. The method will improve the catalytic activity, stability and yield of desired racemate.

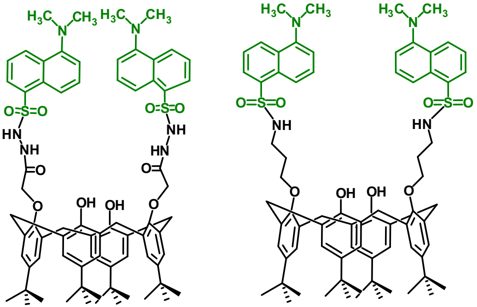

Figure 1: Dansyl derivative of calix[4]arenes.

Acknowledgements: We would like to thank The Research Foundation of Selçuk University (BAP) for financial support of this work.

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Keywords: dansyl, enantioselectivity, calixaren, sol-gel

P-067

A NOVEL PHOTON DETECTOR SYSTEMS PRODUCED BY CARBON NANOTUBES

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Carbon compounds appear to be the most promising materials being chemically very similar to silicon, abundant and easy to handle. In particular, carbon nanotubes (CNT) are very intriguing new form of material, whose properties are worldwide studied providing important results. The photoelectric effect observed on CNT indicates the possibility to build photo-detectors based on CNTs starting a Carbon Era after the silicon Era. We will present recent results of the CNT photon detector from LASER pulsing irradiation, depending of LASER power.

Carbon nanotubes (CNTs; also known as buckytubes) are allotropes of Carbon with a cylindrical nanostructure. Nanotubes have been constructed with length-to-diameter ratio of up to 132,000,000:1, which is significantly larger than any other material. They are monatomic graphene sheet rolled up to obtain a tube tens of micron long and few nanometer diameter. In this structure only the Carbon atoms have saturated electronic bond while the fourth one have free electron making the tube surface electronically and chemically active. The rolling can be made in many directions, defined by two chiral indexes whose value identifies the electrical tube characteristics. These cylindrical carbon molecules have novel properties which make them potentially useful in many applications in nanotechnology, electronics, optics, and other fields of materials science, as well as potential uses in architectural fields. They exhibit extraordinary strength and unique electrical properties, and are efficient thermal conductors. They can be easily produced by Chemical Vapor Deposition (CVD), or arch discharge, or laser ablation. CNTs showed so many new properties in a wide range of applications that raises the idea that Silicon era end is approaching and a new Era based on CNTs technology is just beginning. A schematic diagram has been shown in Figure 1 below.

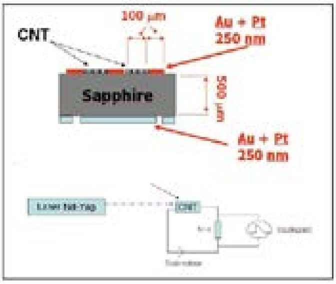

Figure 1: CNT photon detector final design (top) and experimental setup with LASER beam.

Acknowledgement: The authors would like to acknowledge financial support for this work from the Deanship of Scientific Research (DSR), and Faculty of Science, University of Tabuk, Tabuk, Saudi Arabia.

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Keywords: Cabon Nano Tube; Novel photon detector; Nanotechnology.

P-069

ACTIVITY OF CATALYTIC SYSTEM, CONTANING BENZIMIDAZOLIUM SALT, PALLADIUM ACETATE, BASE AND COPPER NANOPARTICULES FOR 2-PHENYLBENZOFURAN SYNTHESIS UNDER MICROWAVE HEATING CONDITIONS

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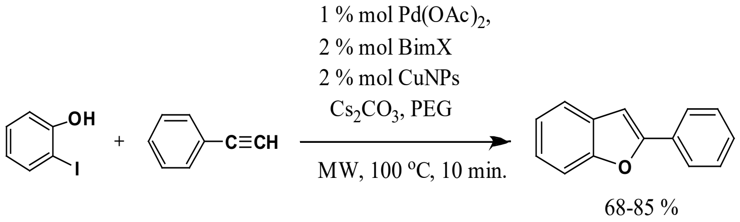
Naturally occurring substituted benzofurans are an important class of pharmaceutically active-oxygen containing heterocycles. Natural products having the 2-phenylbenzofuran moiety possess a board range of biological activities [1]. These types of compounds have attracted considerable interests in recent years for their cytotoxic activities against human breast cancer cells and hepatocellular cancer cells. Among the numerous synthetic methods to obtain 2-phenylbenzofuran, Pd-catalyzed Sonogashira type coupling followed by intramolecular ring closure has been convenient method with longer reaction times [2, 3].

In this study, we have synthesized 2-phenylbenzofuran from the reaction of 2-iodophenol with phenylacetylene through Sonogashira type catalytic reaction presence of catalyst system containing $Pd(OAc)_2$, CuNPs, benzimidazolium salt and base with moderate yield within short reaction time under microwave heating conditions.



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Keywords: Benzimidazole salt, Sonogashira reaction, 2-phenylbenzofuran, catalytic activity

P-071

A NOVEL ELECTROCHEMICAL SENSOR BASED ON CARBON NANOFIBERS AND METAL NANOPARTICLES FOR THE QUANTIFICATION OF ETHYL-PARABEN IN PERSONAL CARE PRODUCTS AND PHARMACEUTICALS

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Paraben (PB) derivatives are preservative chemical substances used for their bactericidal and fungicidal properties by cosmetic and pharmaceutical industry. They can be found in pharmaceuticals, shampoos, moisturizers, spray tanning solutions, shaving gels, makeups, and toothpastes. They are widely used in commercial products due to the extension of the shelf life and low cost [1]. Unfortunately, parabens have toxic properties. They cause eczema, irritation and allergic reactions [2]. Experimental results show that parabens are not only adsorbed on the surface applied but are also identified in skin tissue, blood and urine. Parabens can also mimic hormone estrogen in the body [3]. In this study, carbon nanofibers (CNFs) functionalized by metal nanoparticles were obtained using chemical deposition method in an ultrasonic bath. The synthesized composite material was characterized using X-Ray Diffraction (XRD) spectroscopy. The proposed electrode was used for the determination of Ethyl Paraben (EPB) in 0.1 M phosphate buffer solution (PBS) at pH 7.0 using square wave voltammetry (SWV). Compared with a number of electrodes, a GCE decorated with CNFs and metal nanoparticles also exhibited a large enhancement of voltammetric response for EPB. The peak current increased linearly with the the concentration of EPB in the range of 1.0×10^{-9} M ′ 3.0×10^{-7} M. A linear plot yielded a detection limit of 3.5×10^{-10} M. The proposed electrode provided better voltammetric behaviour, good reproducibility and long time stability. The quantification of EPB in pharmaceuticals and personal care products has succesfully been carried out using the proposed electrode. The validity of the proposed method was also assured by the recovery of EPB in urine samples.

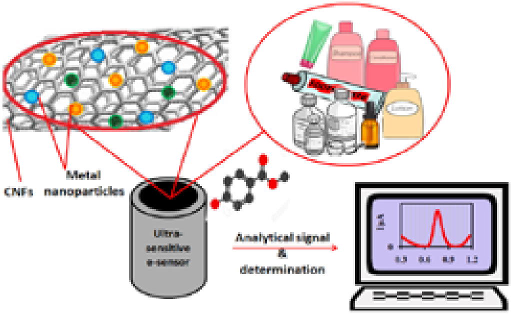

Figure 1. A schematic illustration of the proposed electrode for quantification of EPB.

Acknowledgements: The financial support from the Scientific and Technological Research Council of Turkey for a grant is appreciated (project no: 214Z268)

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Keywords: parabens, electroanalysis, carbon nanofibers, voltammetry

P-072

THE REMOVAL OF Cd and Cu FROM AQUEOUS SOLUTION USING SORBENTS WELNUT SHELL IMMOBILIZED ON IMMOBILIZED ON CO-METHARCRYLIC ACID-STYRENE

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In this study, Cu (II) and Cd (II) ions from aqueous solution using sorbents as wulnut shell immobilized on Co-metharcrylic acid-styrene was investigated conditions of enrichment by solid phase extraction method. The effect of the recovery yield of the ambient pH, eluent type and concentration, solution flow rate, the effect of solution volume, salt effect, column repeatability, examined the application of certified reference material and environmental samples. Improved method has provided 40 times enrichment for Cu and 10 times enrichment for Cd. At optimum conditions, Cu and Cd recovery yields were found to be 100.00 ± 2.30 and 99.89 ± 2.83 % for the 95% confidence level, respectively. In addition, the relative standard deviation of Cu and Cd were found to be 3.99% and 4.90% for 3 repeat experiments, respectively.

Acknowledgements: This work was supported by the University of Siirt scientific research project (2015-SİÜFEB-34)

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Keywords: solid phase extraction, Cd, Cu, sorbent

P-073

OPTIMIZATION OF ARBUTIN EXTRACTION FROM CRANBERRY LEAVES

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Arbutin, which is found at high concentrations in some plants, is a hydroquinone glucoside. Human tyrosinase inhibitory effect on the enzyme naturally occurring arbutin for being stronger than the anomeric Arbutin has great application potential in the cosmetics industry as inhibitory effect on the human tyrosinase enzyme is stronger than the anomeric of naturally occurring arbutin. In this study, Ultrasound-assisted extraction of arbutin from cranberry leaves was modeled by response surface methodologies. To achieve a high extraction efficiency of arbutin, to optimize of extraction variables, which are extraction temperature (X1), extraction times (X2) and methanol concentration (X3), Box-Behnken Design with three-level three-factor was used. The optimized conditions were determined as the extraction temperature of 43.37 ^{0}C, methanol concentration of 56.80% and extraction time of 29.65 min. Experimental yield of arbutin under these optimized conditions was determined as 0.38%. This value are well matched with the estimated value of 0.37% values [1-2].

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Keywords: Arbutin, Extraction, Cranberry, Optimization

P-074

DETERMINATION OF DECOMPOSITION COMPOUNDS OF NOSCAPINE (ALKALOID DERIVATIVE AND DRUG INGREDIENT) BY LC-MS / MS TECHNIQUE

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Showing generally pharmacodynamic and strong physiological activity, Alkaloids carry one or more nitrogen in the ring and are material with basic character. Like other secondary metabolites, Alkaloids are also involved compounds in the defense against pathogens and herbivores[1]. Noscapine, which is not addictive, it is a pharmaceutically active substance and have not analgesic and narcotic properties. It is used in the form of bvase or its salt due to the influence of cough sedatives. It is a member of benzylisoquinolines alkaloids and is used as a medicine because of antitussive features[2]. After taken, Drugs are ingested, metabolized and entered into many interactions. These interactions occur in many different environments, both physically and chemically. Absorption and dispersion occur at different pH environment and active substances can be degraded during this process. This degradability products, especially in drugs, bring about negative consequences such as serious side effects and quality of life. There is no data in the literature regarding the stress tests of noscapine and its decomposition products. However, this analysis should be made to use it safely.

In this study, Noscapine and decomposition products were determined by LC-MS / MS method. For this purpose, stress tests of the active ingredient in acidic, basic, oxidative on the thermal and photolytic conditions were made. Obtained by LC-MS method m / z values and based on the particle sample, possible degradation mechanisms and product of drug have been proposed[4].

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Keywords: Alkoloid, Noscapine, Degradation Product, LC-MS Characterzation

P-075

STUDY OF THE INTERACTION BETWEEN ARA-C AND HUMAN SERUM ALBUMIN BY SPECTROSCOPIC APPROACH

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Study of the protein-drug interaction has a very important place in medicinal chemistry. Because of albumin is the most abundant protein in human blood plasma, human serum albumin (HSA) is often selected as a subject of study. NMR is recognized as a useful method for determining the structure of proteins and protein-ligand complexes.

The Nuclear Magnetic Resonance (NMR) phenomenon has been known for many decades and the NMR spectroscopy has been a powerful tool in physico-chemical analysis for almost fifty years [1]. The fundamentals of NMR studies are depended on magnetic properties of nuclei [2]. Solution NMR has been recognized as a significant method in order to determine structures of proteins and protein complex systems that are easily soluble in aqueous solution [3].

In this study, drug-albumin interactions were investigated versus increasing albumin and drug concentration by 400 MHz NMR spectrometer for Cytosine β-D Arabinofuranoside (Ara-C) and human serum albumin (HSA). In this work, 1H-NMR spectrums (peaks), chemical shifts and data related to relaxation times of peaks were used. The results obtained from these data gave us useful information about molecular dynamics of drug-albumin interactions.

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Keywords: Human serum albumin, ARA-C, NMR, relaxation rates

P-076

Al (III), Cu (II), Co (II), Pb (II), Mn (II), and Fe (III) DETERMINATIONS IN VARIOUS SAMPLES by FAAS AFTER SOLID PHASE EXTRACTION

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Heavy metal pollution is a major issue in all around the world. It occurs by means of air, water, soil and food as a carrier of heavy metals. Particularly, heavy metals can easily enter and accumulate in living organisms through food chain and so, they have a threat on the public health.

The direct analysis of these metals in complex matrices is a challenging matter owing to low concentration of trace metals and interferents. Therefore separation/preconcentration techniques such as solid phase extraction (SPE), solvent extraction, ion extraction, cloud point extraction and co-precipitation prior to instrumental measurements are an important requirement in order to achieve accurate and reliable results. Among them, SPE is extensively used due to its simplicity, high preconcentration factor, short extraction time, low consumption of organic solvents and low cost [1]. Amberlite XAD resins, activated carbon, silica gel, cellulose, chelating resins and polymers are the most widely employed adsorbents for SPE procedure.

In this study, a method for preconcentration of Al (III), Cu (II), Co (II), Pb (II), Mn (II), and Fe (III) in the form of their hematoxylin chelates using a column filled with Amberlite XAD-16 resin was proposed. Metal chelates collected on the resin were eluted by using appropriate solution and determined by flame atomic absorption spectrometry (FAAS). Influences of some analytical parameters including pH, flow rates, sample volume, the type, concentration, and volume of eluent on the preconcentration efficiency were investigated. Effects of some interfering ions on the recovery values of analytes were also examined.

While optimum pH value was 8.5 for Cu (II), Co (II), Mn (II), and Fe (III) ions, it was 6.5 for Al (III) and Pb (II) ions. Appropriate eluent for quantitative elution was 8 mL of 1 M HNO_3 in acetone. Sample and eluent flow rates were found to be 4 $mL.min^{-1}$. The maximum sample volume was established by changing the sample volume from 50 mL to 2500 mL. The sample volume does not significantly affect recovery within the range of 50-2000 mL of the sample volume for the investigated metal ions. The preconcentration factor obtained was 400. The matrix ions studied have no effect on the recoveries of the investigated metals.

Under optimized conditions, the detection limits obtained as concentration corresponding to three times the standard deviation of the blank solution were 0.053, 0.080, 0.620, 1.310, 0.330 and 0.120 $\mu g.L^{-1}$ for Al (III), Cu (II), Co (II), Pb (II), Mn (II), and Fe (III) ions, respectively and the adsorption capacities for these ions were 0.47 ± 0.02, 0.81 ± 0.01, 0.66 ± 0.01, 0.58 ± 0.01, 0.91 ± 0.01, and 0.73 ± 0.02 $mg.g^{-1}$, respectively. Relative standard deviations (RSD) of the method were determined <5%. The accuracy of the method was confirmed by analysing the certified reference materials and recovery studies. The proposed method was successfully applied to tobacco, hair, and some vegetable species.

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Keywords: Heavy metals, solid phase extraction, hematoxylin, Amberlite XAD-16, tobacco, hair

P-077

PHYSICOCHEMICAL PARAMETERS CHARACTERIZATION OF THE TRIAZOLE DERIVATIVE COMPOUNDS USING COMPUTATIONAL METHODS

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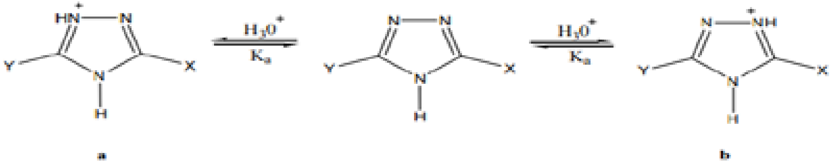
In recent years due to demonstrate different biological activities such as triazoles, oxadiazoles, and thiadiazoles compounds containing five-membered heterocyclic ring is expressed frequently. The uses of triazole fungicide group demonstrate is increased in our country and around the world. [1] Triazole fungicides groups have been found to be effective in many fungi disease. When agricultural products are protect using chemical control methods and these methods must to be more sensitive for human life and pure nature for continuity. [2] On the other hand, in recent years the biological activity is very common to cancer and other similar studies of the triazole derivative such as antifungal, antibacterial, antituberculous , anti- inflammatory and analgesic . Also, highly selective fluorescent and colorimetric sensors are made of high- selective optical and electrochemical active chemosens [3].

In this study, 24 molecules are derivatives of 1,2,4-triazole characterizes be steric molecule and non-steric interactions were investigated using physicochemical parameters computational chemistry methods , pKa values were calculated theoretically one by one. The methods used for geometry optimizations that were PM3 , PM6 , HF / 6-31G and on the other hand , single point energy calculations of equilibrium geometry DFT / B3LYP / 6-31G * method were calculated using Spartan 04 and Gaussian 09 programs. The theoretical values are compared with previous values in the literature and this data source, pKa values and experimental data was investigated parallel between the results.



X = -CH_3, -C_2H_5, -Ph, -NO_2 Y = -CH_3, -C_2H_5

Şema 1. 1,2,4- Triazol molekülünün olası konformasyonları.

Figure 1: 1,2,4- possible conformations of Triazole molecule

Acknowledgements: Vildan E. Atalay and her group will be appreciating to Üsküdar University Faculty of Engineering and Natural Sciences because of their contributions of this study.

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Keywords: computational chemistry, pKa determination, triazole molecules

P-078

A NEW RAPID LIQUID CHROMATOGRAPHY MASS SPECTROMETRY METHOD FOR SEPARATION OF APREPITANT AND TAMOXIFEN

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Aprepitant is a neurokinin inhibitor antiemetic drug for the prevention of nausea and vomiting associated with chemotherapy. Tamoxifen is nonsteroid anti-estrogen drug which is extensively used with breast cancer [1,2].

In this study, a new, simple, rapid and accurate LC-MS method developed for the separation Aprepitant and Tamoxifen. The chromatographic determination was achieved by C18 reverse phase column particle size 3µm, 50 x 2.1 mm. The mobile phase consisting of 0.2% formic acid and acetonitrile in the ratio of 55:45 v/v was used. The flow rate was 0.4 mL/min. The MS detection was performed on a single quadrupole liquid chromatograph mass spectrometer (LC-MS) using electro spray ionization, positive mode at $m/z = 534.2$ for aprepitant, $m/z = 372$ for Tamoxifen [3,4].

The developed method is simple, sensitive and reproducible and can be used safely routine analysis of Aprepitant and Tamoxifen in tablets and capsules.

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Keywords: Aprepitant and Tamoxifen in tablets and capsules.

P-079

VOLTAMMETRIC BEHAVIOR OF NIMESULIDE IN THE ABSENCE AND PRESENCE OF HYDROGEN PEROXIDE

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Drugs belonging to the non-steroidal anti-inflammatory drug group (NSAIDs) are not only used as anti-inflammatory and analgesic agents, but also show chemopreventive effects on various cancer cell lines[1]. Nimesulide, N-(4-nitro-2-phenoxiphenyl)methanesulfonamide, is a drug that belongs to the (NSAIDs) group [Figure 1].

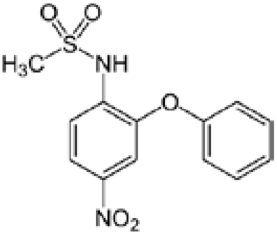

Figure 1: Chemical structure of nimesulide.

Hydrogen peroxide (H_2O_2) is a reactive oxygen species in the brain that is most often regarded as a potential toxin because, under certain conditions, it can form highly reactive hydroxyl radicals that can irreversibly alter DNA, lipid and protein structure. It is also an important player in reductive-oxidative-based signal transduction cascades and thus is essential for normal cell function, especially in the brain [2,3]. Thus, it is important to research the interaction of drugs with H_2O_2.

In this study, the voltammetric behaviour of nimesulide at 0.1 M phosphate buffer (pH=7.40) in the absence and presence of H_2O_2 has been investigated by using cyclic and square-wave voltammetry techniques. At physiological pH (7.40) nimesulide and H_2O_2 give a reduction peak at -0.78 V and -1.30 V, respectively. The peak of nimesulide corresponds to the reduction of the nitro group, which is the only possible electroreducible group in the molecule. When the H_2O_2 is added to nimesulide solution, the peak current of nimesulide increases.

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Keywords: Voltammetry, Drug, Hydrogen Peroxide

P-080

INHIBITION EFFECT OF *ROBINIA PSEUDOACACIA* LEAF EXTRACT ON CORROSION OF MILD STEEL IN ACIDIC MEDIUM

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Steel derivatives are widely used in industry. Main problem of these metals is corrosion. Corrosion is the deterioration of a metal due to interaction with its environment. Especially acid solutions cause corrosion and these solutions are used in the industry to remove mill scales from the metallic surface [1–3]. As corrosion causes economic loses and environmental pollution and also carries risks for human life, it must be controlled. The use of inhibitors is one of the most practical methods for protection of the metals against corrosion, especially in acidic media [4].

In this paper extract of *Robinia pseudoacacia leaf* extract was investigated as inhibitor of mild steel corrosion in 1M H_2SO_4 by using electrochemical techniques. According to the experimental results inhibition efficiency was found as %79 and %80 by potentidynamic polarization curves and electrochemical impedance method respectively. The inhibition efficiency increased with the increasing inhibitor concentration. It was found that of *Robinia pseudoacacia leaf* extract shifted the corrosion potential to positive region .and anodic Tafel slope increased with addition of extract in corrosive medium. This means that *Robinia pseudoacacia* extract was affect the anodic reaction of corrosion process. Potentiodynamic polarization curves were recorded at different temperature for finding activation energy of corrosion process and effect of temperature to corrosion of mild steel in acidic solution absence and presence of inhibitor. Corrosion current was increased with the increasing temperature as expected.

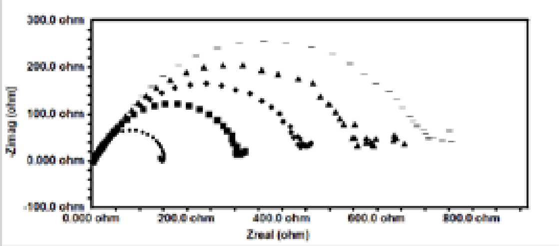

Figure 1: EIS diagram for absence (●) and presence of different inhibitor concentration(extract of ▪-5 g/L, ♦- 12.5g/L, ▲-25g/L, -50g/L in 1MH_2SO_4

Acknowledgements: The author is grateful to Mersin University research fund for providing financial support.

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Keywords: Corrosion inhibition, mild steel, tafel, Robinia pseudoacacia

P-082

DETERMINATION OF URIC ACID USING Al_2O_3 NANOPARTICLES MODIFIED CARBON PASTE ELECTRODE

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Uric acid (2, 6, 8-trihydroxypurine) is an end product from purine derivatives in human metabolism. Abnormal uric acid level in biological fluids is a marker of several disorders such as gout, renal disease, hyperuricemia and Lesch-Nyhan syndrome [1]. Thus, rapid and reliable determination of uric acid in biological fluids is routinely required for diagnosis and treatment. Various techniques such as, fluorescence [2], spectrophotometry [3], HPLC-mass spectrometry [4], ion chromatography [5], colorimetry [6], chemiluminescence [7], electrochemistry [8], and electrochemical biosensors [9] have been reported for uric acid determination. Among these techniques, electrochemistry provide advantages like direct measurement, low cost, rapid response, high sensitivity and selectivity. Recently, there has been a growing interest in studying the application of metal oxide nanoparticles in constructing modified electrodes due to their unique physical and chemical properties. These nanoparticles exhibit large surface-to-volume ratio, high surface reaction activity, high and catalytic efficiency [10]. Carbon paste can provide a suitable electrode substrate for preparation of modified electrodes and the use of metal oxide nanoparticles in carbon paste is a promising approach to modified electrodes.

In this study Al_2O_3 nanoparticles modified carbon paste electrode (Al_2O_3-MCPE) for selective determination of uric acid is described. Al_2O_3-MCPE was prepared by mixing the desired amounts of graphite powder, Al_2O_3 nanoparticles and paraffin oil. After mixing the paste for approximately 20 minutes to ensure the homogenity, the paste was packed firmly into the the bottom of the working electrode body and the electrode surface was polished with a weight paper to have a smooth surface. The modified electrode was evaluated as a sensor for determination of uric acid (UA) in human serum. The electrochemical behavior of uric acid (UA) at the Al_2O_3-MCPE was investigated by cyclic voltammetry (CV) and square wave voltammetry (SWV) in phosphate buffer solution at pH 5.0. The electrooxidation of UA at the modified electrode is well defined with enhanced anodic peak current than the bare CPE. The CV results showed that the modified electrode exhibited an improved electrocatalytic activity towards the oxidation of UA, compared to bare CPE. The effect of pH was studied to determine the optimum working conditions for UA detection. Linear calibration curve was obtained over the range of 3.0×10^{-7} – 6.0×10^{-5} M with a detection limit of 1.81×10^{-7} M (S/N=3). The interference effect of ascorbic acid and glucose was investigated. The results showed that these species had no significant interference on the determination of UA. The practical application of Al_2O_3-MCPE modified electrode was tested by measuring the concentration of UA in human serum sample. The standard addition technique was used for the determination of UA. The result obtained with the proposed sensor was compared with the result of the photometric method. It was found that the results are in good agreement, indicative of the good accuracy of this method. This result indicated that the proposed sensor could be an effective tool for the determination of UA in human serum samples.

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Keywords: Al2O3 nanoparticles, carbon paste electrode, square wave voltammetry, uric acid

P-083

THEORETICAL CALCULATION OF ELECTRONIC PROPERTIES OF DI-PHENYLPHOSPHINO AMINOBUTYL SILVER(I) COMPLEX

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In this study, the highest occupied molecular orbital (HOMO) energies, the lowest unoccupied molecular orbital (LUMO) energies, band gap (ΔE), Mulliken atomic charges, the electronic properties that are electronegativity, ionisation potential, electron affinity chemical hardness and softness of diphenylphosphino aminobutyl silver(I) ($[Ag(MeCN)_2(Ph_2PCH_2)_2N(CH_2)_3CH_3]$) complex has been investigated by using Gaussian 09W program [1].

All these electronic parameters of the complex in the ground state have been calculated by using two methods, which are Hartree–Fock (HF) and density functional (DFT/B3LYP) method with the LanL2DZ basis set.

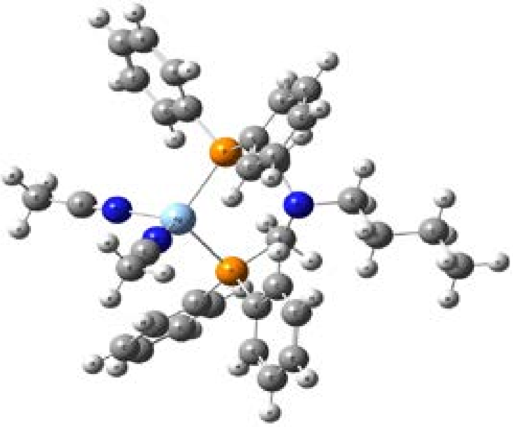

Figure 1: Optimized structure of $Ag(MeCN)_2(Ph_2PCH_2)_2N(CH_2)_3CH_3$

Acknowledgements: The authors would like to acknowledge the support provided by TUBITAK under the Project No 114R023.

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Keywords: DFT, HF, Electronic Parameters, HOMO-LUMO

P-085

SIMULTANEOUS DETERMINATION OF ASCORBIC ACID, NOREPINEPHRINE AND URIC ACID BY DIFFERENTIAL PULSE VOLTAMMETRY ON A DISPOSABLE PENCIL GRAPHITE ELECTRODE IN THE PHARMACEUTICAL FORMULATIONS AND HUMAN URINE SAMPLES

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Norepinephrine (NE) is a very important neurotransmitter in the mammalian central nervous system and mechanical pressure to excite sensory nerve endings in the skin, chemical neurotransmitters to transmit signals from one neuron to the next in the brain, and electrical current to transmit signals between successive muscle cells in the heart and intestine [1]. Ascorbic acid (AA) and Uric acid(UA) are important analytes that present in many biological fluids. A large number of papers in the literature involve the use of modified electrodes [2,3].

In this study, the electrochemical behaviors of AA, NE and UA on the pencil graphite electrode (PGE) were investigated by cyclic voltammetry (CV) and differantial pulse voltammetry (DPV) at different supporting solutions (acetate, phosphate and Britton-Robinson). By simultaneously changing the concentrations of these three molecules, their electrochemical oxidation peaks appeared at +0.16, 0.41 and 0.54 V, respectively (Figure 1). The peak currents were found to vary linearly with their concentrations in the range of 250-850 nM, 40-160 nM and 60-180 nM for AA, NE and UA, respectively. The proposed electrochemical method was successfully applied for quantification AA and NE individually in commercial pharmaceutical formulations, and AA and NE plus UA in spiked human urine samples. The prepared electrode showed several advantages, such as a modified electrode method, high sensitivity and low detection limits.

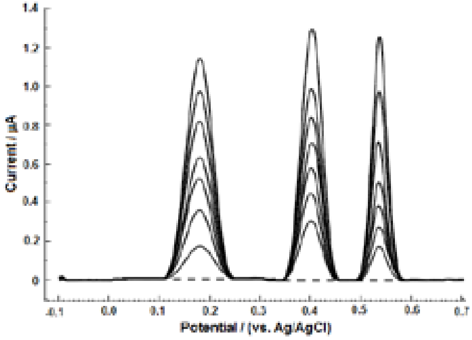

Figure 1. DP voltammograms of AA, NE and UA in BR buffer at pH 4.0 *at PGE, DPV parameters: Step Potential, 1 mV; Modulation amplitude, 40 mV; Modulation Time, 0.03 s, Interval Time 0.4 s.*

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Keywords: Norepinephrine, Pencil Graphite Electrode, Simultaneous Determination

P-086

SOME METHANESULFONATES-BASED ACETYLCHOLINESTERASE INHIBITORS

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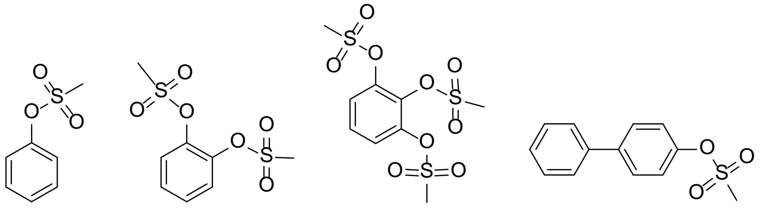
Alzheimer's disease (AD) is a progressive neurodegenerative disorder characterized by intellectual decline and abnormal behavior. AD has become one of the main public health problems, especially in the western world due to the increasing number of elderly population [1,2]. Although pathogenesis of AD has not been clarified, one of the most accepted theories has been "cholinergic hypothesis". A deficiency in levels of the neuromediators acetylcholine (ACh) and butyrylcholine (BCh) has been observed in the brains of AD patients. Inhibition of acetylcholinesterase (AChE) and butyrylcholinesterase (BChE), the key enzymes which hydrolyze ACh and BCh, respectively, has become a major treatment option towards AD [3]. Therefore, we have initiated a study to screen compounds (Figure 1) for their acetylcholinesterase (AChE, EC 3.1.1.7) inhibitory activities. Four simple methanesulfonates were investigated and showed IC_{50} values in the range of 0.7374-3.3977 µM for AChE.



1 **2** **3** **4**

Figure 1: Chemical structures of tested compounds.

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Keywords: Methanesulfonate, acetylcholinesterase, butyrylcholinesterase.

P-087

UV/VIS INVESTIGATION OF METHANOL SOLVATION BEHAVIOR OF SOME PYRIMIDINES CONTAINING KETO AND THIOKETO GROUPS

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Time dependent methanol solvation properties of recently synthesized 5-benzoyl-1-(methylphenylmethyleneamino)-4-phenyl-1H-pyrimidine-2-one (**I**) and 5-benzoyl-1-(methylphenylmethyleneamino)-4-phenyl-1H-pyrimidine-2-thione (**II**) were studied by using UV-Vis spectroscopy at pH values 1.0 and 13.0 in methanol medium at constant temperature of 25 ± 0.1 °C using a thermostat. Pseudo first order methanol solvation rate constants were determined in excess methanol concentration over the compounds **I** and **II**. Compound **I** was found to undergo solvation only in pH 13.0 solutions. However, compound **II** was found to undergo solvation in both strongly acidic and basic solutions. The roles of the keto oxygen of **I** and the thioketo sulfur of **II** on the solvation were discussed. The preferred solvation mechanisms were discussed based on UV-VIS data.

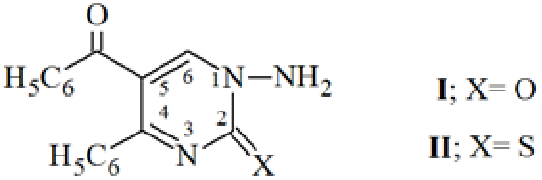

Figure 1: Pyrimidines of this investigation

Acknowledgements: The authors are grateful to the Scientific Research Project Program (Project No: FEN-C-YLP- 130515-0188) of Marmara University for their financial support and the provision of laboratory facilities.

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Keywords: Pyrimidines, Keto, Methanol Solvation, Thioketo

P-090

MODULATORY EFFECTS OF *ELAEAGNUS UMBELLATE* THUNB. (AUTUMN OLIVE) LEAF AND FRUIT AQUEOUS EXTRACTS *IN VIVO* MARKER ANTIOXIDANT ENZYMES

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Elaeagnus umbellate Thunb. (Autumn olive, AO) is native to Southern Europe and Central Asia and was introduced to the US in the 1830s from East Asia as an ornamental plant [1]. *E. umbellate* is abundantly found in Pakistan, China, Japan, and Korea, Afghanistan, India, United States of America, Canada, Hawaii [2] and, also in Turkey [3]. *E. umbellata* grows on shrubs from Samsun to Artvin on Blacksea Region, Turkey [4]. This plant was introduced to the Turkey in the 2000s for an ornamental plant and food to grow under natural conditions. It can be found in almost any untended location in Turkey [3]. Recently, studies conducted that the fruit and leaf *E. umbellata* are loaded with nutrients and other parts have medicinal properties [3,5,6].

The various human diseases are associated with oxidative stress caused by reactive oxygen species and free radicals generated in the living cells. Current research is directed toward finding naturally occurring antioxidant components of plant origin. Therefore, we examined the in vivo antioxidant potential of AO aqueous leaf (AOAL) and fruit extracts (AOAF).

This study was outlined to probe *in vivo* antioxidant potential of aqueous leaf (L) and fruit (F) extracts of *E. umbellata* and butylated hydroxyanisole (BHA) using different *in vivo* antioxidant assays. An *in vivo* study of modulatory properties of *E. umbellata* in mice was also conducted by examining the levels of malondialdehyde (MDA) and the activities of antioxidant enzymes, including superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx) and glutathione reductase (GR) using different dosages (50 and 100 mg/kg body-weight of AO extracts through oral gavage, daily for 14 days in liver as well as extrahepatic organs. The activities of antioxidant enzymes and the level of lipid peroxidation in liver, lung, kidney, forestomach, hearth and brain were assayed by using standard methods.

Mice (*Swiss albino*) were divided into six groups of eight animals each. Group I (control), group II received AOAF (50 mg/kg body weight, orally), group III received AOAF (50 mg/kg body weight, orally), group IV received AOAL (50 mg/kg body weight, orally), group V received AOAL (100 mg/kg body weight, orally), while group VI received BHA (butylated hydroxyanisole, positive control) (0.75 % in diet).

We demonstrated a significant increase of SOD level (group IV and V) in liver, kidney and hearth as compared with the control group. An increase of GR (group II and III in lung), GPx (group II in kidney, lung and hearth) after 14 days. The AOAL (50 mg/kg body weight, orally) was effective in the level of lipid peroxidation in liver and heath.

The results suggest a modulating role of AOAL and AOAL (50 and 100 mg/kg body wt given orally for 14 days) raised the level of antioxidant enzymes in mice and is a valuable source of natural antioxidants.

Acknowledgements:We would like to thank the Scientific and Technological Research Council of Turkey (TÜBİTAK) for financial support of this work (114Z683).

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Keywords: Elaeagnus umbellate thunb, Autumn olive, In vivo antioxidant enzymes, lipid peroxidation

P-091

IMPACT OF *ELAEAGNUS UMBELLATE* THUNB. (AUTUMN OLIVE) LEAF AND FRUIT CRUDE AQUEOUS EXTRACTS ON MICE HEPATIC MARKER DRUG METABOLIZING ENZYMES

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Elaeagnus umbellate Thunb. (Autumn olive, AO), a vigorous shrub or small tree, was introduced in the U.S. from Asia around 1830 as an ornamental plant [1]. The fruit of AO can be eaten fresh, or processed for preserves, condiments, fruit rolls and flavoring, or used as a substitute for tomato products due to the carotenoid lycopene [2]. Lycopene has been associated with the prevention of certain chronic diseases such as myocardial infarction and prostate cancer. The barriers of AO have been shown to have about 17 times the amount of the antioxidant lycopene than tomatoes [3,4]. AO was introduced to the Turkey in the 2000s for an ornamental plant and food to grow under natural conditions [5]. A study conducted that the leaf extract of AO showed antibacterial activity against *Staphylococcus aureus*, *Bacillus subtilis*, *Escherichia coli* and *Pseudomonas aeruginosa* [6].

Chemoprevention by used medicinal plants is a promising approach for controlling cancer diseases. There is substantial evidence to indicate that chemopreventive agents exert their anticarcinogenic effects by modulation of phase I and phase II xenobiotic-metabolizing enzymes in *liver*. Cytochrome P450, a family of phase I hemoproteins, represents a major adaptive response against chemical challenge from the environment and catalyzes the activation of various procarcinogens to ultimate carcinogens. Phase II enzymes detoxify pro- and ultimate forms of chemical carcinogens. Therefore, we examined the chemopreventive potential of AO aqueous leaf (AOAL) and fruit extracts (AOAF).

Mice (*Swiss albino*) were divided into six groups of eight animals each. Group I (control), group II received AOAF (50 mg/kg body weight, orally), group III received AOAF (50 mg/kg body weight, orally), group IV received AOAL (50 mg/kg body weight, orally), group V received AOAL (100 mg/kg body weight, orally), while group VI received BHA (butylated hydroxyanisole) (0.75 % in diet). The chemopreventive properties of AOAF and AOAL in modulating the cytochrome P450 (cyt.P450), cytochrome $\underline{b}_5$ (cyt $\underline{b}_5$), glutathione S-transferase (GST), DT-diaphorase (DTD) *glucose-6-phosphate dehydrogenase* (G6PDH), 6-phosphogluconate *dehydrogenase* (6PGDH), lactate dehydrogenase (LDH) sulfhydryl groups, total sulfhydryl groups (T-SH); non-protein sulfhydryl groups (NP-SH); protein-bound sulfhydryl groups (PB-SH) were all studied.

A significant increase in xenobiotic enzymes like cyt.P450 and cyt.$\underline{b}_5$ in 50 and 100 mg/kg body weight dose of AOAL and AOAF were observed. The content of T-SH, NP-SH and PB-SH in liver tissue was found greater than control group. The results of treatment with AOAL (10 mg/kg body weight, orally) in group V mice observed an increase in LDH, G6PDH, 6PGDH, GST and DTD when compared to control mice.

These findings demonstrate that the aqueous leaf and fruit extracts from *Elaeagnus umbellate* Thunb. is a potential source of natural chemoprevention.

Acknowledgements: We would like to thank the Scientific and Technological Research Council of Turkey (TÜBİTAK) for financial support of this work (114Z683).

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Keywords: Elaeagnus umbellate thunb., Autumn olive, drug metabolizing enzymes (phase I and II), natural chemoprevention

P-093

COMPARISON OF TAMOXIFEN ENTRAPMENT CAPACITIES AND RELEASE PROFILES OF ALGINATE, ALGINATE/CHITOSAN, MAGNETIC ALGINATE AND MAGNETIC ALGINATE/CHITOSAN BEADS

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Tamoxifen is a white crystalline synthetic drug used to prevent and treat breast cancer[1]. It is an antagonist for estrogen receptors in mammary tissue via its active metabolite hydroxytamoxifen. Hydroxytamoxifen attacks to the estrogen receptor and acts as a natural stimulator and prevents the natural response[2].

Alginate is a natural polymer which is produced from brown algae. It is a nontoxic and biodegradable linear polysaccharide. Chitosan is also a nontoxic and degradable polymer. Alginate and chitosan are frequently used for biomedical and drug delivery studies[3].

In this study, alginate beads were produced by polyelectrolytic complex reaction between sodium alginate and calcium chloride. After alginate beads were formed, they were coated with chitosan to obtain alginate/chitosan beads. Magnetic alginate and magnetic alginate/chitosan beads was formed by immobilization of Fe_3O_4 nanoparticles. Tamoxifen loaded beads were produced by adding tamoxifen citrate in alginate solution during bead production.

Tamoxifen entrapment capacities of alginate, alginate/chitosan, magnetic alginate and magnetic alginate/chitosan beads were compared. Tamoxifen entrapment capacity were found to be 88.5 % for alginate beads, 81.5 % for alginate/chitosan beads, 93.6 % for magnetic alginate beads and 89.1 % for magnetic alginate/chitosan beads. Tamoxifen release from beads was compared for *in vitro* gastric fluid and *in vitro* intestinal fluid. In i*n vitro* gastric fluid tamoxifen release was 1.2 % from alginate beads, 0.8 % from alginate/chitosan beads, 0.8 % from magnetic alginate beads and 0.2 % from magnetic alginate/chitosan beads at the end of one hour. After 5 hours tamoxifen release rose to 8.8 % from alginate beads, 6.8 % from alginate/chitosan beads, 6.1 % from magnetic alginate beads and 5.4 % from magnetic alginate/chitosan beads in gastric fluid. In i*n vitro* intestinal fluid tamoxifen release ratios were 9.1 % from alginate beads, 3.8 % from alginate/chitosan beads, 8.1 % from magnetic alginate beads and 2.8 % from magnetic alginate/chitosan beads at the end of an hour. After 5 hours tamoxifen released 39.8 % from alginate beads, 35.7 % from alginate/chitosan beads, 36.4 % from magnetic alginate beads and 31.9 % from magnetic alginate/chitosan beads *in vitro* intestinal fluid.

Acknowledgements: This work was supported by ADU BAP

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Keywords: Alginate, chitosan, drug release, magnetic, tamoxifen

P-094

PRODUCTION AND DRUG RELEASE ASSESMENT OF MELATONIN LOADED ALGINATE/GUM ARABIC BEADS

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Conventional application of drug doses for treatment of diseases involves repetitive introduction of the medicine with equal intervals. However, this method may cause oscillation of the drug concentration and this may lead to toxic levels.

Controlled drug release systems aims to balance this oscillation and provide a constant level of drug for the period of time. Controlled drug release systems are accepted as more reliable and high therapeutic carriers compared to conventional drug pills.

Melatonin is a hormone which is released from pineolacites of pineal gland and regulates circadian rhythm in humans. Low melatonin release may cause sleep disorder, tiredness and memory impairment. In order to restore these disorders melatonin is available as over the counter supplement drug.

Biopolymers are natural, biodegradable and generally nontoxic materials. Due to these properties they are often used in pharmacological and food industry applications. Alginate which obtained from brown algae and gum arabic which is the leakage from acacia tree are two common biopolymers used as carriers in aforementioned procedures.

In this work melatonin and gum arabic were added to alginate solution and beads were produced by ionotropic gelation. Immobilization rate of melatonin in heads was calculated to be approximately 70%.

Release of melatonin from the beads was measured using *in vitro* gastric fluid and intestinal fluid (pH 1.5 and pH 7.4) and release profiles were plotted. According to results obtained melatonin release from the beads in pH 1.5 medium was approximately 45% in the first 5 hours whereas the release was approximately 40% in pH 7.4 medium. The results indicate that the beads manufactured may be used as carriers for melatonin.

Acknowledgements: This work is supported by ADÜ BAP

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Keywords: Melatonin, alginate, gum arabic, bead, controlled drug release

P-095

PRODUCTION AND INVESTIGATION OF CONTROLLED DRUG RELEASE PROPERTIES OF TAMOXIFEN LOADED ALGINATE/GUM ARABIC MICROBEADS

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The expected principle feature of the drug therapy is to keep the concentration of the drug in therapeutic level. Therefore introduction of the drug should be repeated with proper intervals.

Tamoxifen is a synthetic drug used for cancer therapy. It is an antagonist for estrogen receptors in mammary tissue via its active metabolite hydroxytamoxifen. Antagonist attacks to the cell receptor and acts as a natural stimulator and prevents the natural response.

Biodegradable polymers are good choices of carrier materials as drug carrier/transfer due to their nontoxic and biocompatible properties. Natural polysaccharides are far beyond these properties and they are used for drug carrier production. Among natural polymers, chitosan, alginate, gum arabic and starch are used alone or in combination in order to manufacture drug carrier systems.

In this work, tamoxifen loaded alginate/gum arabic microbeads are produced using ionotropic gelation in $CaCl_2$ solution. The process is optimized and approximately 90% of initial tamoxifen was immobilized in the beads. The extend of drug release in *in vitro* gastric and small intestine media was measured using pH 1.5 and pH 7.4 buffer solutions for 24 h. According to the results obtained in the first 5h release % of tamoxifen in pH 1.5 was 20%, whereas in pH 7.4 the release was 53% of the initial drug amount. The release ratio did not change after five hours. The initial results indicate that alginate/gum arabic beads may be a suitable carrier for tamoxifen.

Acknowledgements: This work was supported by ADÜ BAP

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Keywords: Tamoxifen, alginate, gum arabic, microbeads, controlled drug release.

P-097

SYNTHESIS, STRUCTURAL EXPLANATION ON CARRYING SOME NEW BIS BENZIMIDAZOL, BENZOXAZOLE AND BENZOTHIAZOLE DERIVATIVES

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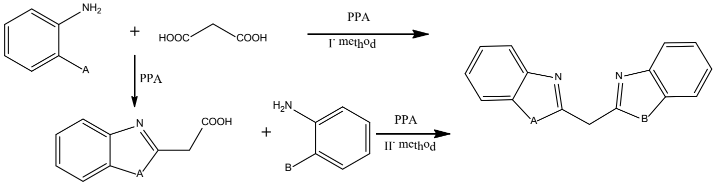
The structure of benzazoles (benzimidazole, benzoxazole, and benzothiazole) derivatives is isosteres of purine, pyrimidine structures, tryptophane and serotonin amino acids and placed in the natural structure of vitamin B_{12}. These structures have been keen interest of the researches for more than hundred years[1]. These ring-systems used for their antiulcer, antihelmintic, antiviral, antihistaminic, anti-inflammatory and antioxidant activities have been prominent.

In this study, we aimed to find conventional and microwave synthesis methods for simetric and unsimetric bisbenzazoles such as bis-benzimidazole/benzoxazole/ and benzothiazole derivatives. The compounds were prepared from 1,2-phenylendiamine/2-aminophenol/2-aminothiophenol and carboxylic acid derivatives by comparative studies with conventional and microwave irradiation methods [2]. These structural modifications have given a large number of available benzazole compounds for pharmacological research [3]. These group compounds can be promising lead compound for further development of novel benzazole structures, considering its anticancer activity potency.



A= -NH-, -O-, -S- **B** = -NH-, -O-, -S-

I. method: microwave irradiation; II. method: Conventional methods

Figure 1: Synthesis methods of bis-benzazoles

Acknowledgements: Financial support was provided by grant from the Research Foundation of Mersin University (2015-AP3-1228).

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Keywords: Benzazoles, benzimidazole, benzoxazole, benzothiazole, conventional synthesis method, microwave synthesis method

P-098

INVESTIGATION OF ANTITUBERCULOSIS ACTIVITY OF SOME 2-SUBSTITUED BENZIMIDAZOL DERIVATIVES WITH AGAR PROPORTION METHOD

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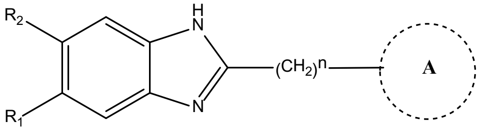
Tuberculosis (TB) is the leading infectious disease characterized by the highest mortality worldwide currently. In TB control, initiation of effective treatment with early and accurate diagnosis to patients and controlling the treatment regularly is necessary[1].

First line anti-TB drugs used in the standard treatment of TB patients are isoniazid, rifampicin, ethambutol and streptomycin. Drug-susceptible TB disease is treated with a standard six month course of four antimicrobial drugs. Standard anti-TB drugs have been used for decades, and resistance to the medicines is widespread. Multidrug-resistant tuberculosis (MDR-TB) is a form of TB caused by bacteria that do not respond to, at least, isoniazid and rifampicin, the two most powerful anti-TB drugs. MDR-TB is treatable and curable by using second-line drugs (e.g., amikacin**,** capreomycin**,** ciprofloxacin, ethionamide**).** However second-line treatment options are limited and recommended medicines may not be always available. In some cases, more severe drug resistance can develop. Extensively drug-resistant TB (XDR-TB) is a form of multi-drug resistant tuberculosis that responds to even fewer available medicines, including the most effective second-line anti-TB drugs. Therefore, failures in the treatment of TB infections are increasing due to the development of increased resistance by usage of existing anti-TB drugs and the increase in the number of patients with immune deficiency[2].

In recent years, there are some benzimidazole compounds which are used in various therapeutic areas for their many effects such as antiulcerative, antihelmintic, antiviral, antihistaminic, antiinflammatory and antioxidant. With performed numerous studies, compounds bearing the benzimidazole ring, antimicrobial and anti-TB activities were determined[2].



R$_1$= -H, -Cl **R**$_2$=-H, -CH$_3$, -Cl **n**= 1, 2

A= 4-hydoxyphenyl, 4-chlorophenyl, 1-naphtyl, 2-naphtyl

Figure 1: Structures of synthesized compounds.

In this study, we aimed to find conventional and microwave synthesis methods for some two substituted benzimidazole derivatives. The compounds in the title were prepared from 1,2-phenylendiamine/substituted 1,2-phenylendiamine and suitable aldehyde or carboxylic acid derivatives by comparative studies with conventional and microwave irradiation methods[3]. Then, we demonstrated *in vitro* anti-TB activity of these synthesized determined by the agar proportion method.

Acknowledgements: Financial support was provided by grant from the Research Foundation of Mersin University (2015-AP3-1320).

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Keywords: Antituberculosis activity, benzimidazole, tuberculosis, Agar proportion method

P-099

SIX COORDINATION COMPOUNDS: MODE OF CYTOTOXIC ACTION AND BIOLOGICAL EVALUATION

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This study describes the biological and anticancer properties of followed coordination compounds. *IR* spectra, magnetic properties, thermal analyses and crystal structures of six cyanido-complexes derivatives with $[M^{II}(CN)_4]^{2-}$ (M^{II}= Ni and Pd) and $[Co(CN)_6]^{3-}$ anions and *N-bishydeten* (*N,N*-bis(2-hydroxyethyl)ethylenediamine) as a capping ligand have been previously reported. Here, we investigated these complexes denoted as [Ni(*N-bishydeten*)Ni$(CN)_4$] (***C1***), [Zn_2(*N-bishydeten*)$_2$Ni$(CN)_4$] (***C2***), [Ni(*N-bishydeten*)Pd$(CN)_4$] (***C3***), [Cd(*N-bishydeten*)$_2$][Pd$(CN)_4$] (***C4***), [Ni_2(*N-bishydeten*)$_2$Co$(CN)_6$].$3H_2O$ (***C5***) and K[Cd(*N-bishydeten*)Co$(CN)_6$].$1.5H_2O$ (***C6***), which were tested for their anti-proliferative activity against human cervical cancer (HeLa), human colon cancer (HT29), rat glioma (C6) and African green monkey kidney (Vero) cell lines. The DNA/BSA binding affinities of these compounds were also elucidated by spectroscopic titrations, displacement experiments and electrophoresis measurements. Studies on cancerous cells revealed that ***C1***, ***C2***, ***C4*** and ***C6*** exhibited significant antitumor activity and inhibited tumor progression in testing cell lines and showed high solubility in the solvent. Absorbance and emission spectra data results revealed that the complexes interact with the DNA via groove binding mode of interaction. Overall, these compounds have been found to demonstrate effective anti-proliferative activity against the cancer cell lines, indicating that they are a potent candidate for preclinical or clinical study.

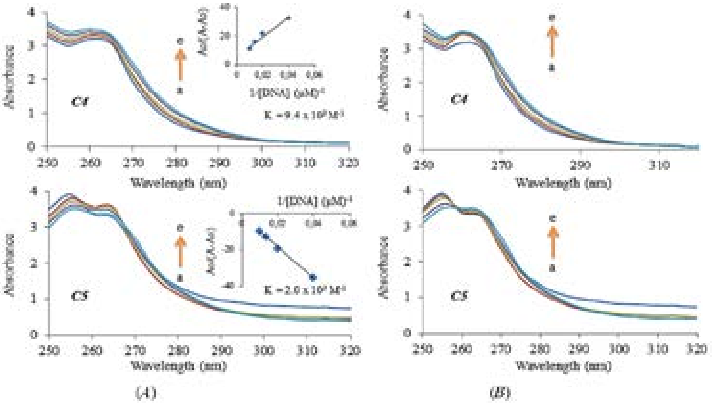

Figure 1. (***A***) UV–Visible absorption spectra of 25 µM the complexes in the absence (a) and presence of 25 µM (b), 50 µM (c), 75 µM (d) and 100 µM (e) DNA. Note: The direction of arrow demonstrates increasing concentrations of DNA. Inset is the plot of $A_0/(A–A_0)$ vs. 1/[DNA] to find the binding constant of complex–DNA adduct. (***B***) Absorption spectra of 25 µM the complexes (a) in presence of different concentrations of BSA 25 µM (b), 50 µM (c), 75 µM (d), and 100 µM (e). Note: The direction of arrow demonstrates increasing concentrations of BSA.

Keywords: Coordination compounds, Anticancer activity, Cytotoxic activity, Apoptosis, DNA binding

P-100

SYNTHESIS AND IN-VITRO BIOLOGICAL ACTIVITIES OF SOME NEW 1-(MORPHOLINE-4-YL-METHYL)-3-ALKYL(ARYL)-4-(4-ETHOXYBENZYLIDENAMINO)-4,5-DIHYDRO-1*H*-1,2,4-TRIAZOL-5-ONES

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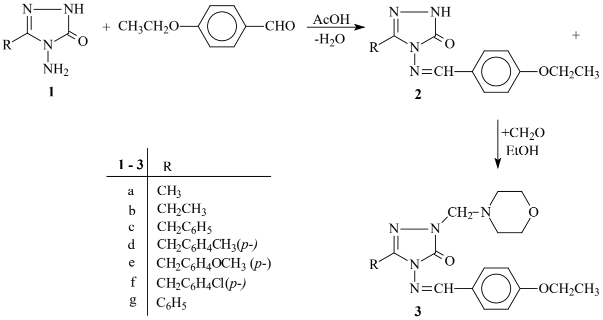
In this study, 3-alkyl(aryl)-4-(4-ethoxybenzylidenamino)-4,5-dihydro-1H-1,2,4-triazol-5-ones **(2a-g)** reacted with formaldehyde and morpholine to afford 1-(morpholine-4-yl-methyl)-3-alkyl(aryl)-4-(4-ethoxybenzylidenamino)-4,5-dihydro-1H-1,2,4-triazol-5-ones **(3a-g)**. The structures of seven new Mannich bases were established from the elemental analysis, IR, 1H NMR, 13C NMR and UV spectral data. Then, the synthesized compounds were analyzed for their in vitro potential antioxidant activities in three different methods; including reducing power, free radical scavenging and metal chelating activity [1-3]. Furthermore, these new compounds were screened for their antimicrobial activities. The starting compounds **1** and **2** were prepared according to literature [4-6].



1 - 3	R
a	CH_3
b	CH_2CH_3
c	$CH_2C_6H_5$
d	$CH_2C_6H_4CH_3$(*p-*)
e	$CH_2C_6H_4OCH_3$ (*p-*)
f	$CH_2C_6H_4Cl$(*p-*)
g	C_6H_5

Figure 1: Synthesis route of compounds 3.

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Keywords: 4,5-dihydro-1H-1,2,4-triazol-5-one, Mannich base, antioxidant and Biological Activities

P-101

A NEW ANTIDIABETIC DRUG'S RAW MATERIAL: FERULA ELAEOCHYTRIS

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It is estimated that about 35% to 75% of men who are suffered from diabetes was experienced at least some degree of erectile dysfunction (ED) or impotence during their lifetime [1].Ferula elaeochytris is a plant species found in Turkey which is often used for erectile dysfunction especially in patients with diabetes mellitus (DM) [2]. We designed a biosensor which is rapidly measured the blood glucose level which is treated with *Ferula Eleaochytris.*

The first of all, streptozocin (STZ) was used for pancreatic β cell damage in mice [3]. In this study, 20 mice were studied with 3 mice groups. These group are control, STZ and STZ+ *Ferula Elaeochytris*. The blood samples taken from mice groups every week. For biosensors studies glucose oxidase enzyme immobilized via poli Hema-Mac nanopolymer on gold electrode surface. In this study, glutaraldehyde was used as a crosslinker and benzoquinone selected as a mediator.

In this study, the blood glucose lowering effect of the *Ferula Elaeochytris* in streptozocin induced diabetic mice was rapidly shown with biosensor. STZ group have both ED and DM when compared with STZ+*Ferula Elaeochytris* group. STZ+Ferula Elaeochytris group mice blood glucose levels is lower than STZ group mice blood glucose levels.

Ferula Elaeochytris are grown in very large quantities in Cukurova region and have been used by patients with erectile dysfunction. While it benefits in diabetic patient, it may cause hypoglycemia in healthy individuals. Therefore, the dose range and the effective use should be determined and the datas obtained should be supported with clinical studies. It was observed that Ferula Elaeochytris have therapeutic effect for both DM and ED.

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Keywords: Ferula Elaeochytris, Diabetes Mellitus, Biosensor

P-103

SYNTHESIS, CHARACTERIZATION AND ELECTROCHEMICAL PROPERTIES OF NEW METAL FREE, COBALT(II), COPPER(II) AND MANGANESE(III) PHTHALOCYANINES

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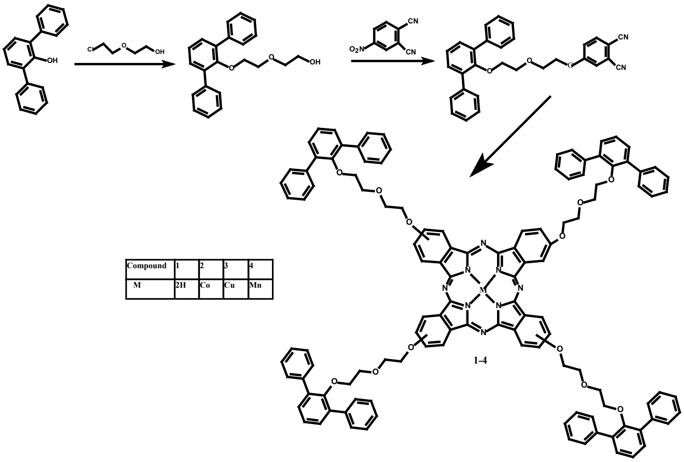
Phthalocyanines (Pcs) are 18 π-electron macrocyclic conjugated systems. Phthalocyanines are also, promising materials for applications in catalysts, chemical sensors, liquid crystals, nonlinear optics, solar cell, photodynamic therapy (PDT) of cancer electrochromic devices. Owing to low solubility of phthalocyanines in organic solvents, application of their is limited. The solubility of phthalocyanines alter of their chemical, physical and electrochemical properties. In this study, new metallophthalocyanine complexes (Free, Co, Cu and Mn) were synthesized using the phthalonitrile derivative. All proposed structures were supported by using spectroscopic methods. Electrochemical properties of $Cu^{II}Pc$, $Mn^{III}Pc$ and $Co^{II}Pc$ were investigated by using cyclic voltammetry (CV) and square wave voltammetry (SWV) techniques.



Compound	1	2	3	4
M	2H	Co	Cu	Mn

1-4

This study was supported by The Scientific & Technological Research Council of Turkey (TÜBİTAK, project no: 115Z712).

References:

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Keywords: Phthalocyanine, Synthesis, Electrochemistry

P-104

SYNTHESIS OF TETRA PERIPHERAL SUBSTITUTED NEW PHTHALOCYANINES DERİVATIVES AND THEIR ELECTROCHEMICAL PROPERTIES

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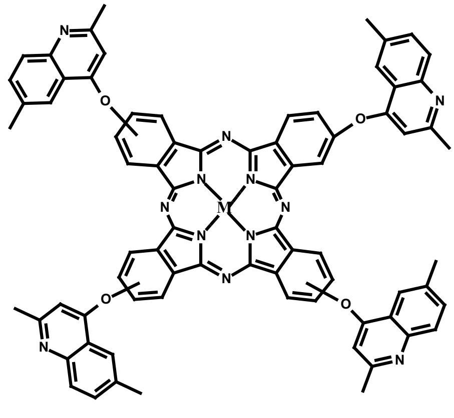
Phthalocyanines are a class of macrocyclic compounds possessing a system of conjugated π-electrons. Phthalocyanines, having structural similarities with porphyrins, exhibit remarkable properties like intense brightness, high thermal and chemical stability, and high efficiency in electron transfer [1]. Peripheral substitution withlong alkyl chains, bulky groups and crown ethers leads to Pc derivatives soluble in common organic solvents [2]. The solubility of phthalocyanines alter of their chemical, physical and electrochemical properties. Electrochemical techniques provide an attractive means to analyze the content of a target sample due to the direct conversion of an event to an electronic signal [3]. Electrochemical determination of metal ions was usually performed by anodic stripping voltammetry (ASV) at mercury or solid electrodes [4]. Direct determination of metal ions by cyclic voltammetry (CV) using solid electrodes is limited because of a low signal-to-noise ratio. In this study, new phthalocyanine complexes were synthesized using the phthalonitrile derivative. All proposed structures were supported by using spectroscopic methods. Electrochemical properties of $Cu^{II}Pc$, $Mn^{III}Pc$ and $Co^{II}Pc$ were investigated by using cyclic voltammetry (CV) and square wave voltammetry (SWV) techniques.



M= Co(II), Cu(II), Mn(III) and 2H

This study was supported by The Scientific & Technological Research Council of Turkey (TÜBİTAK, project no: 115Z712).

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Keywords: Synthesis, Electrochemical Properties, Phthalocyanines

P-105

SYNTHESIS AND ELECTROCHEMISTRY OF PHTHALOCYANINES BEARING [2-[2-(4-ALLYL-2-METHOXYPHENOXY)ETHOXY]OXY] GROUPS

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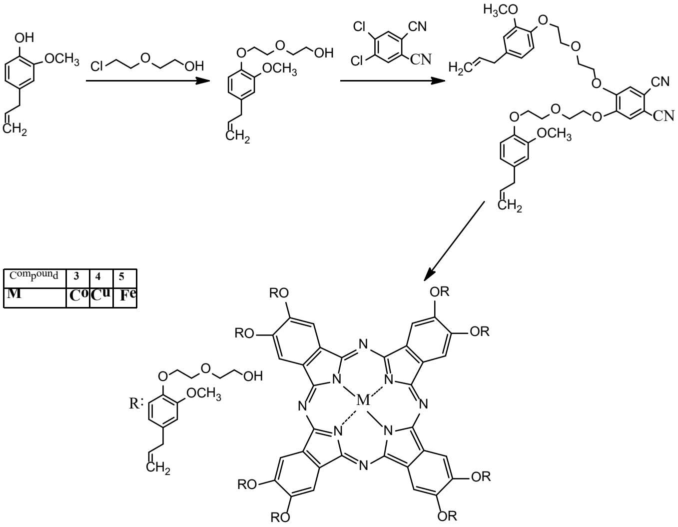
Phthalocyanines are quite versatile and stable macrocyclic compounds. These macrocyclic compounds possess very important physical and chemical properties. This class of compouds are environment friendly. They don't degradation til 400-500 °C in the air. These compounds stand up to strong acids and bases. Otherwise, these excellent compouds quite attract attention due to capable of coordinating with almost all metals. In the past, these significant compounds were solely known as pigments, so, they used dye industry. Today they exhibits technological applications in different areas such as catalysts, chemical sensors, langmuir blodget films, non-linear optics, gas sensors, photodynamic therapy, liquid crystals and electrochemical applications. In this study peripherally octa-substituted metallophthalocyanines complexes (Co, Cu and Fe) bearing 2-[2-(4-allyl-2-methoxyphenoxy) ethoxy] oxy groups will synthesis and characterization. Electrochemical properties of novel phthalocyanines **3**, **4** and **5** will determine by cyclic and square wave voltammetry in order to define their possible applications in different electrochemical technologies.



Compound	3	4	5
M	Co	Cu	Fe

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Keywords: Phthalocyanine, Electrochemistry, Synthesis

P-107

SYNTHESIS AND PROPERTIES OF CYCLOTRIPHOSPHAZENE-BODIPY CONJUGATES

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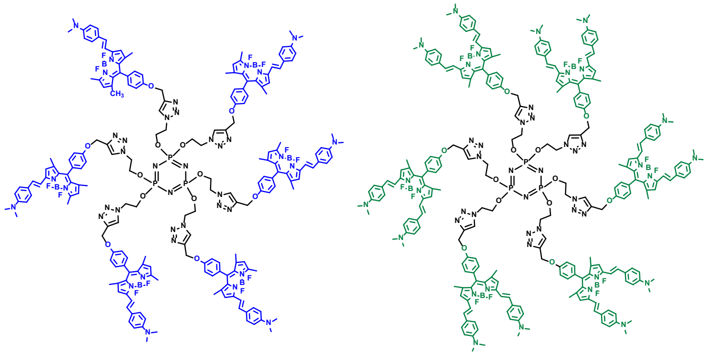
Photodynamic therapy (PDT) has been started to be used for the treatment of different types of the cancer disease. The PDT strategy is based on the principle of the preferential localization of photosensitizers in tumor tissues, generating singlet oxygen through being stimulated by red or near infrared (NIR) light; and thus destroying the tumor cells. The ideal photosensitizer agent is expected to have features such as bio-stability, selectivity to the target tissue, strong absorption peak, and having the capacity to generate singlet oxygen [1].

In this study cyclotriphosphazenes as an important class of inorganic ring systems that exhibit different physical and chemical characteristics depending on the properties of the reagents and reaction conditions, and BODIPY dyes for its contemporary importance among fluorescent organic dyes have been selected for the inorganic-organic hybrid systems and prepared cyclotriphosphazene compounds as the photosensitizer candidate and determined the capacities of their singlet oxygen generation [2,3]. Thus with these considerations, new cyclotriphosphazene-BODIPY conjugates (1, 2) were synthesized and fully characterized by the standard spectroscopic techniques such as mass spectrometry (MALDI-TOF), FT-IR, ^{1}H, ^{13}C and ^{31}P NMR spectroscopies and elemental analysis as well. Additionally, fluorescence properties of these compounds were investigated by using UV-vis and fluorescence spectrophotometer to measure the singlet oxygen generating capacity of the compound.



(1)

(2)

Figure 1: Chemical structures of compounds **1** and **2**

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Keywords: Cyclotriphosphazene, BODIPY, PDT, singlet oxygen

P-108

SYNTHESIS AND CHARACTERIZATION OF SUBSTITUTED THIOPHEN-2-CARBOXALDEHYDE TSC LIGANDS AND THEIR Ni(II)/Co(II) COMPLEXES

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Thiosemicarbazones and their etal complexes have been extensively studied during recent years mainly because of their various biological properties [1-2]. Thiosemicarbazones usually act as chelating ligands with transition metal ions, bonding through the sulfur and hydrazine nitrogen atoms [3]. Their metal complexes have been the subject of extensive investigations because of their potential pharmacological properties and a wide variation in their modes of bonding and stereochemistry [4].

The recation of Cobalt(II) and Nickel(II) chlorides with a series of thiosemicarbazone ligands TSC^{1} (2-acetyl-5-chloro-thiophene thiosemicarbazone), TSC^{2} (2-acetyl-5-methyl-thiophene thiosemicarbazone) leads to the formation of new monomeric and dimeric complexes $[M(\eta^2\text{-}N,S\text{-TSC})_2]$, $[MX(\eta^2\text{-}N,S\text{-TSC})]_2$, [M: Ni, Co; X:Cl]. The crystal structures of the free ligand and of the complexes have been determined by the X-ray diffraction methods. Structural characterization of the complexes have been done by elementel analysis, FT-IR, ^{1}H NMR spectroscopy. For all these complexes the central ion is coordinated through the sulfur and the azomethine nitrogen atom of the thiosemicarbazones.

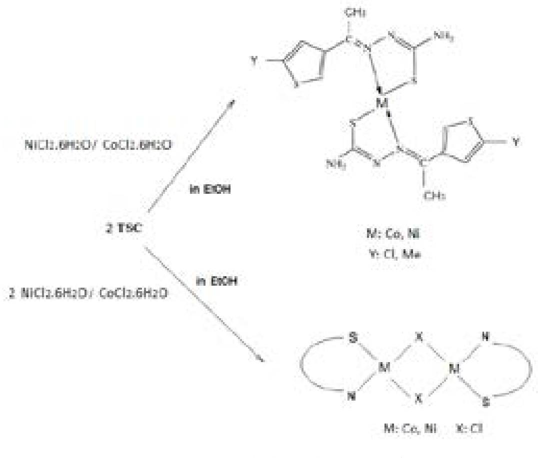

Figure 1: TSC-Co(II)/Ni(II) complexes

Acknowledgements: This work was supported by DEÜ, BAP 2015.KB.FEN.018

References:

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Keywords: Thiosemicarbazones, Ni, Co complexes

P-110

NEW PALLADIUM (II) COMPLEXES OF A SERIES OF THIOSEMICARBAZONES

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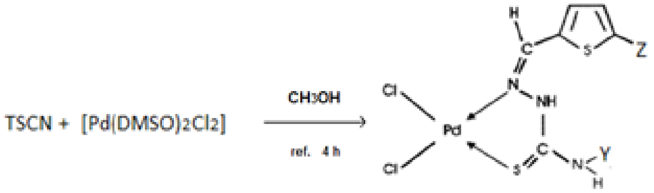
Thiosemicarbazones are of considerable interest because of their chemistry and potentially beneficial biological activities, such as antitumor, antibacterial, antiviral and antimalarial activities [1]. The biological activities of thiosemicarbazones are considered to be due to their ability to form chelates with heavy metals. Introduction of metal ion into thiosemicarbazones enhances their activity to highest [2]. Pyridine containing heterocyclic thiosemicarbazones and their metal complexes have been reported due to their potencial for medicinal use, whereas thiosemicarbazones with thiophen heterocyclic rings have not been studied [3,4].

Thiosemicarbazones and their palladium(II) complexes of the type [Pd(TSCN)Cl_2] (where TSCN=thiosemicarbazone) were prepared from 5-chloro/5-bromo/5-methyl-thiophene-2-carboxaldehyde-N-phenyl/N-methyl/N-ethyl thiosemicarbazone and [Pd$(DMSO)_2Cl_2$], respectively. Coordination via the thionic sulphur and the azomethine nitrogen atom of the thiosemicarbazones to the metal ion were confirmed by spectral data. Structural characterization of the complexes have been done by elementel analysis, FT-IR, ^{1}H NMR spectroscopy.



Z	Y		
Cl	Ph	Me	Et
Me	Ph	Me	Et

Figure 1: TSCN-Pd(II) complexes

Acknowledgements: *This work was supported by DEÜ, BAP 2015.KB.FEN.018*

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Keywords: Palladıum (II) Complexes,Thıosemıcarbazones,Spectroscopy

P-112

NOVEL SYMMETRIC AND ASYMMETRIC AZIDO- Ga(III) PHTHALOCYANINES

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Second generation photosensitizers such as phthalocyanines(Pcs) have also been introduced for PDT in research and clinical trials. Pcs are known to be useful photosensitizers [1,2]. Altering the peripheral substitution of the macrocyclic ring is one way of tailoring the solubility properties of the Pc material. Gallium(III)Pc complexes showed fascinating photophysical and photochemical properties especially high singlet oxygen quantum yields which are very important for PDT of cancer[3].

With the overall goal to develop water-soluble photosensitisers that may hold potential as novel theranostic agents, we designed symmetric asymmetric azido-Ga(III) Pcs substituted with tetraethylene glycol chains. In this work, we report on the effects of the substituents on the photophysical and photochemical properties of Ga(III)Pc derivativesin DMSO.Consequently, we determined which substitution pattern are the most suitable considering photodynamic applications.

Acknowledgements:

The Scientific and Technological Research Council of Turkey (TUBITAK) is gratefully acknowledged for his funding through the project 113R004 coupled to the COST Action TD1004.

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Keywords: Phthalocyanine, gallium(III), Photosensizer, PDT

P-113

SYNTHESIS AND STRUCTURAL CHARACTERIZATION OF NOVEL BISMUTH(III) BROMIDE COMPLEXES WITH THIOAMIDES

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Bismuth is the heaviest pnictogen (Group 15) element and is well known to provide therapeutic responses or demonstrate a positive bioactivity. The use of bismuth compounds in medicine can be traced back to the Middle Ages and the first account of using bismuth as medicine in 1789 [1]. Bismuth is recognized as a low-toxicity metal and applications of bismuth have been widespread, due to its antiseptic, astringent, protective, antacid, antisecretory and local gastrointestinal properties [2]. Currently, the major medicinal use of bismuth compounds is focused in two fields: antimicrobial and anticancer. In the antimicrobial field, bismuth subcitrate (De-Nol®), bismuth subsalicylate (Pepto-Bismol®) and ranitidine bismuth citrate (Tritec® and Pylorid®) have been used in the treatment of various microbial infections [3]. In the anticancer field, some bismuth compounds were examined recently. Early studies showed that $\{[Bi(tgn)_3(H_2O)]\cdot3.5H_2O\}$ (tgn: thioguanine) and $\{Na_2[BiO(mp)_3].H_2O\}$ (mp: 6-mercaptopurine) exhibit anticancer activities. New studies have shown that bismuth xanthane complexes $(Bi(S_2COR)_3)$ and bismuth dithiocarbamates complexes $(Bi(S_2CNR_2)_3)$ exhibit potent in vitro cytotoxic activity against cancer cell lines [4].

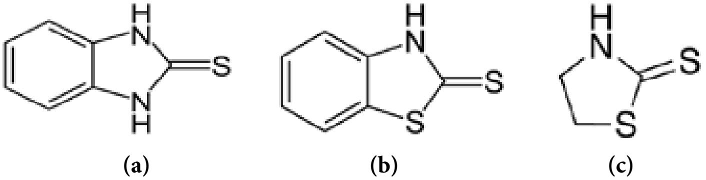

Figure 1: Molecular structure of the ligand used (a) MBZIM, (b) MBZT and (c) MTZD

In this study, we report the synthesis and spectroscopic characterization of new bismuth (III) bromide complexes with 2-mercaptobenzimodazole (MBZIM), 2-mercaptobenzothiazole (MBZT) and 2-mercaptothiazolidine (MTZD) (Figure 1). The complexes were characterized by their melting point, molar conductivity, elemental analysis, FT-IR spectroscopy, FT-Raman spectroscopy, ^1H and ^{13}C NMR spectroscopy and Thermal Gravimetry- Differential Thermal Analysis (TG-DTA). The crystal and molecular structure of bismuth(III) bromide complexes of 2-mercaptobenzimodazole (MBZIM) and 2-mercaptobenzothiazole (MBZT) were determined with single crystal X-ray diffraction analysis.

Acknowledgement: This research was support by the Scientific and Technological Research Council of Turkey (Project No. TUBITAK 114Z457).

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Keywords: Synthesis, Characterization, Bismuth(III) Bromide, Thioamides

P-114

SYNTHESIS AND STRUCTURAL CHARACTERIZATION OF NEW ANTIMONY(III) CHLORIDE COMPLEX WITH N,N-DIETHYLTHIOUREA

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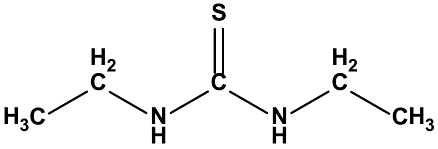
Antimony has been used as a drug for over more than 100 years [1]. Antimonies, have been mainly, used for the treatment of Leishmaniasis [2]. Moreover the antitumor activity of antimony compounds has been, also reported, recently [3]. Sodium stibogluconate has been evaluated for antileukamemic activity against the myeloid leukaemia cells line [4]. Studies of some organoantimony compounds, such as diphenylantimony(III) thiolates have shown higher activity than the corresponding organotin(IV) compounds against Ehrlich ascites tumor cell lines [5-6]. Antimony (III) compounds tested, in vitro, for their inhibitory effects on the proliferation of murine leukemia cells (L1210), murine mammary carcinoma cells (FM3A), human T-lymphocyte cells (Molt4/C8, CEM) and human cervix carcinoma cells (HeLa) were found to exhibit selectivity against HeLa cells [7]. Among antimony(III) halogen complexes with thione ligands, chlorides were shown the strongest activity which is comparable and in some cases better than the corresponding of cisplatin [7-9].



N'N¯Diethylthiourea ($C_5H_{12}N_2S$)

Figure 1: Formula of the ligand used

In this study, we report the synthesis and spectroscopic characterization of new antimony (III) chloride complex with N,N-diethylthiourea (DETU) (Figure 1). The complex $\{([SbCl_2(DETU)_2]Cl)_n\}$ was characterized by its melting point, molar conductivity, elemental analysis, FT-IR spectroscopy, FT-Raman spectroscopy, ^{1}H and ^{13}C NMR spectroscopy and Thermal Gravimetry- Differential Thermal Analysis (TG-DTA). The crystal and molecular structure of complex was determined with single crystal X-ray diffraction analysis.

Acknowledgement: This research was support by the Namik Kemal University Scientific Research Projects Fund (Project No: NKUBAP.09.10.AR.14.17)

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Keywords: antimony, chracterization, x-ray

P-115

NOVEL COPPER (I/II) COMPLEXES CONTAINING SUBSTITUTED THIOPHEN-2-CARBOXALDEHYDE TSC LIGANDS AND THEIR BIOLOGICAL ACTIVITIES

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Thiosemicarbazones, with the general formula $R^1R^2C^2{=}N^3{-}N^2(H){-}C^1({=}S)N^1R^3R^4$ usually react as chelating ligands with transition metal ions by bonding through the sulfur and hydrazinic nitrogen atom [1-2]. Thiosemicarbazones and their metal complexes have been the subject of extensive investigations because of their potential pharmacological properties and a wide variation in their modes of bonding and stereochemistry [3].

Complexes represent the reaction of Copper (I/II) halides (bromide or chloride) with TSC^1 (2-acetyl-5-chloro-thiophene thiosemicarbazone), TSC^2 (2-acetyl-5-methyl-thiophene thiosemicarbazone). The addition of two mmols of Ph_3P to these precipitates in situ formed clear solutions, which on slow evaporation yielded compounds of empirical formula, $[CuX(\eta^1\text{-}S\text{-TSC})(Ph_3P)_2]$, [*X*; Br , Cl] .The addition of one mmol of Ph_3P to these precipitates in situ formed clear solutions, which yielded compounds of empirical formula, $[CuX(\boldsymbol{\eta}^1\text{-}S\text{-TSC})(Ph_3P)]$, [*X*; Br, Cl]. Structural characterization of Cu (I) complexes have been done by elementel analysis, FT-IR, ^1H and ^{31}P NMR spectroscopy. Antimicrobial activities of the complexes have been researched.

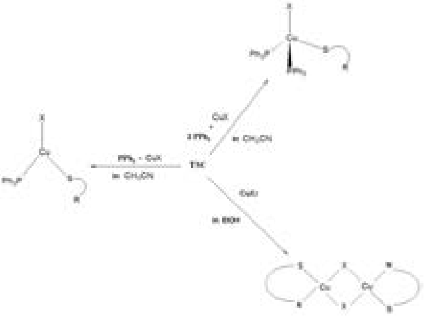

Figure 1: TSC containing Copper (I/II) complexes

Acknowledgements: *This work was supported by* ***TÜBİTAK 2209-A***

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Keywords: TSC,Ligand,complexes

P-116

THE SYNTHESIS AND CHARACTERIZATION OF DIOXOMOLYBDENUM(VI) COMPLEXES OF 3, 5-DI-TERT-BUTYL-SALICYLALDEHYDE-S-BUTYL THIOSEMICARBAZONE

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Molybdenum is an essential trace element that plays an important role in maintaining several biological activities in plants and animals, in a large number of enzymatic reactions. [1] The potent biological activity of tridentate thiosemicarbazones and their metal complexes has been recognized for over 50 years [2, 3] They possess potent cytotoxicities or anti-proliferative behavior with IC_{50} values that can lie in the μM range and they can be active against viruses, bacteria, fungi and tumors [4].

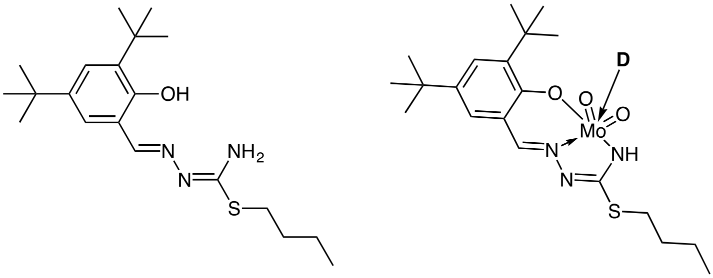

Figure 1: Ligand and Complexes

Three new dioxomolybdenum(VI) complexes with 3,5-di-tertbutylsalicylaldehyde-S-butyl thiosemicarbazones (L) were prepared. They were characterized as mononuclear [MoO_2LD] complexes by ^{1}H-NMR, FT-IR, UV–Vis, X-Ray, elemental analysis, and melting point measurements.

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Keywords: thiosemicarbazone, complexes, dioxomolybdenum

P-117

SYNTHESIS AND CHARACTERIZATION OF 3-CHLORO-*N*-(DIALKYLCARBAMOTHIOYL)BENZAMIDE AND THEIR NICKEL AND COPPER COMPLEXES

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3-Chloro-*N*-(dialkylcarbamothioyl)benzamide and their nickel and copper complexes have been synthesized according to literature [1]. The structure of the obtained compounds were characterized by elemental analyses, FT-IR and NMR methods. The nickel complex of 3-chloro-*N*-(diethylcarbamothioyl)benzamide have been also confirmed by X-ray single crystal diffraction study (Figure 1). Crystal data of the *bis*(3-chloro-*N*-(di-ethylcarbamothiol)benzamido) nickel(II) compound, $C_{24}H_{28}C_{l2}N_4NiO_2S_2$ (M=598.23 g/mol): Monoclinic, Space group P2(1)/c, a = 14.601(2) Å, b = 8.3617(12) Å, c = 22.350(30) Å, β = 98.231(3)°, V = 2700.7(7) Å^3 , Z = 4 and D_{calc} = 1.471 g/cm^3. The *bis*(4-chloro-*N*-(di-ethylcarbamothioyl)benzamido) nickel(II) complex which the nickel ion is four-coordinated by two S and two O atoms. Coordination geometry around the nickel atom is described as a distorted square planar geometry.

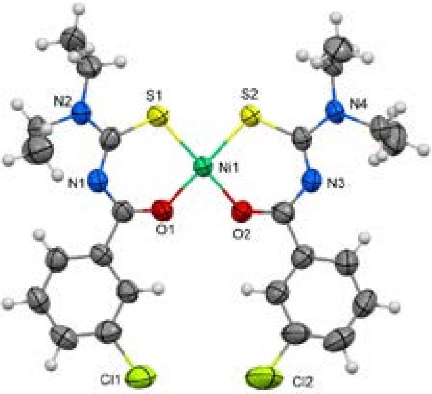

Figure 1. Molecular structure of *bis*(3-chloro-*N*-(di-ethylcarbamothiol)benzamido) nickel(II).

Acknowledgements: This study was supported by the Research Fund of Mersin University in Turkey with Project Number: 2015-AP4-1198.

References:

[1] Binzet, G., Arslan, H., Flörke, U., Külcü, N., Duran, N., *Journal of Coordination Chemistry* **2006,** 59(12), 1395-1406.

Keywords: Benzoyl thiourea, {cis}-Configuration, Complex, Synthesis, X-ray Single Crystal Diffraction.

P-118

SYNTHESIS, CHARACTERIZATION AND ANTIMICROROBIAL ACTIVITY OF BENZAMIDE DERIVATIVES AND THEIR PALLADIUM AND PLATINUM COMPLEXES

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The new benzamide derivatives, 4-Chloro-*N*-(dibenzylcarbamothioyl)benzamide, *N*-(dibenzylcarbamothioyl)-4-methylbenzamide and their palladium(II) and platinum(II) complexes were synthesized, and structurally characterized by FT-IR, ^{1}H NMR, ^{13}C NMR, COSY and HMQC techniques. In addition, synthesized Pt(II) and Pd(II) metal complexes were evaluated for both their *in-vitro* antibacterial and antifungal activity. The findings have been reported, explained and compared with fluconazole and ampicillin used as reference drugs [1].

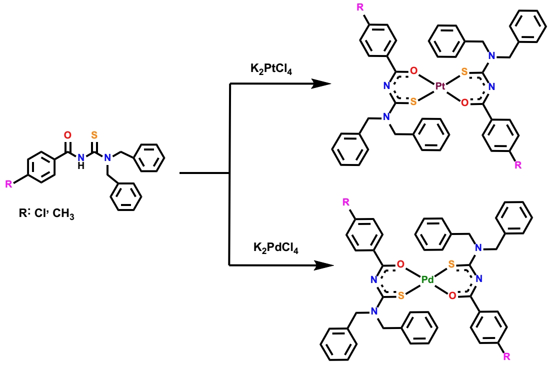

Figure 1. Reaction scheme of platinum and palladium complexes.

Acknowledgements: This study was supported by the Research Fund of Mersin University in Turkey with Project Number: 2015-AP4-1426.

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Keywords: Antimicrobial activity, benzamide derivatives, Palladium complex, platinum complex

P-119

COORDINATION COMPOUND OF 2-MERCAPTO-1-METHYLIMIDAZOLE WITH BISMUTH(III): SYNTHESIS AND STRUCTURAL CHARACTERIZATION

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Bismuth(Bi) is located in periodic table Group 15. In spite of not being essential for life, it plays a therapeutic role in human healthcare via interaction with biomolecules [1]. Bismuth compounds interact with nucleotides, amino acids, peptides, proteins and enzymes, which are closely related to their uptake, accumulation, redox, transport and excretion in human bodies and in turn account for their antimicrobial, anticancer, antivirus and antiparasite activities [2]. The use of bismuth compounds in medicine can be traced back to the Middle Ages and the first account of using bismuth as medicine was in 1786 by Louis Odier for the treatment of dyspepsia. Although bismuth compounds have been used to treat various microbial infection such as syphilis, colitis, would infections and quartan malaria, and so on, the major medicinal applications of bismuth compounds are associated with gastrointestinal disorders and ulcers, and the medicinal efficacies are related to their inhibition activity to Helicobacter pylori, a bacterium that can prevent ulcers from healing [3]. On the other hand, 2-mercapto-1-methylimidazole is a drug used to treat hyperthyroidism, a condition that occurs when the thyroid gland begins to produce an excess of thyroid hormone. The drug may also be taken before thyroid surgery to lower thyroid hormone levels and minimize the effects of thyroid manipulation. Additionally, 2-mercapto-1-methylimidazole is used in the veterinary setting to treat hyperthyroidism in cats [4].

Figure 1: Molecular structure and ball-and-stick form of 2-mercapto-1-methylimidazole

In this study, we report the synthesis and spectroscopic characterization of new bismuth (III) bromide complex with 2-mercapto-1-methylimidazole (MMI) (Figure 1). The complex $\{[BiBr_2(\mu_2\text{-}Br)(MMI)_2]_2\}$ was characterized by its melting point, molar conductivity, elemental analysis, FT-IR spectroscopy, FT-Raman spectroscopy, ^{1}H and ^{13}C NMR spectroscopy and Thermal Gravimetry- Differential Thermal Analysis (TG-DTA). The crystal and molecular structure of complex was determined with single crystal X-ray diffraction analysis.

Acknowledgement: This research was support by the Scientific and Technological Research Council of Turkey (Project No. TUBITAK 114Z457).

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Keywords: bismuth, characterization, X-ray.

P-120

SYNTHESIS OF AEROGELS WITH DIFFERENT STARTING MATERIALS

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Silica aerogels consist of a crosslinked SiO_2 network in three dimensions and pore size of aerogel is in mesoporous range from 2 to 50 nm. It can be synthesized from organosilicon precursor by sol-gel route and dried by the supercritical extraction method. They are extremely porous materials synthesized through sol-gel chemistry to form a solvent-filled porous solid, which normally is dried under the supercritical conditions in order to prevent collapse of the tenuous solid network. Silica aerogel has low thermal conductivity (10-20 mW/m.K), high porosity (80-95 %), small pore size (10-20 nm in diameter), amorphous material, and transparent. However, high porosity, low density and amorphous structure of silica aerogel result in mechanically weak and fragile material and they are not as transparent as glass.

GENERAL PROCEDURE:

Figure 1: Synthesis of aerogels mechanism

Acknowledgements: Aerogel, Synthesis, Material

References:

[1] Fricke, J. and T. Tillotson, *Thin Solid Films*, **1997**, 297(1-2), 212-223.
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Keywords: Aerogel, Synthesis, Material

P-121

SYNTHESIS AND CHARACTERIZATION OF NICKEL OCTAAMIDO PHTHALOCYANINE

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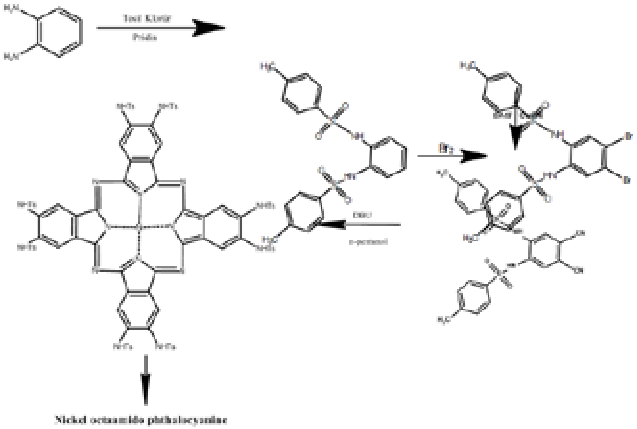
Phthalocyanines having unique properties in chemical sensor, liquid crystals, nonlinear opticals have received considerable attention over the last decade.[1] The key property of phthalocyanines is fundamental property is its high cycle electron delocalization. Most of the applications of phtalocyanine are focused on the electronic properties of the π-electron system of the macrocycles.[2]. Crystal structure of starting compounds was obtained. In this study phthalocyanine have been synthesized with higher yields modifing the literature method.[3] This method consists of four steps. Nickel octaamido phthalocyanine structure was explained via FT-IR, NMR and LC-MS spectroscopies.



Acknowledgment: This study is supported by TUBITAK (115Z105)

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Keywords: phthalocyanine, crystal, phenilenediamine

P-122

MESO-TETRAPHENYLPORPHYRIN-BASED NANOFIBERS: OXYGEN SENSOR PROPERTY AND SILVER NANOPARTICLES INFLUENCE

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To improve optical sensing properties, nanofiber and nanoscale beads fabrication has emerged as one of the most important research areas. Their porous structure with enhanced surface area, feasibility of their modification made them useful especially for gas sensing studies[1-5]. In this study, palladium(II) and platinum(II) *meso*-tetraphenylporphyrins bearing phenylacetylide moieties (**Pd-TPA** and **Pt-TPA)** were designed to improve the phosphorescence oxygen sensing properties. The syntheses were successfully achieved in good and reproducible yield using successively a Sonogashira coupling and metal insertion by microwave irradiation.

Oxygen sensitivities of **Pd-TPA** and **Pt-TPA** were studied in solution phase as well as in poly(TMSP) polymeric nanofibers, in absence or presence of silver nanoparticles (AgNP). As far as we know, it is the first time that poly(TMSP) nanofibers of have been prepared by this technique[6]. Such nanofibers shows a good sensitivity against oxygen improve by the presence of AgNP.

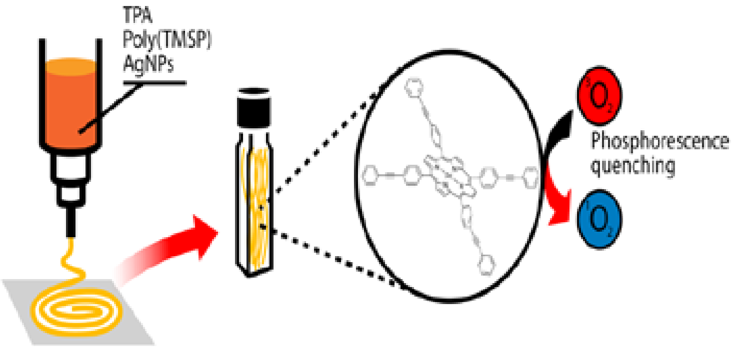

Figure 1: Oxygen sensing probes (M= Pd, Pt) investigated in this study.

Acknowledgements: The authors thank TÜBİTAK for financial support (project number: 111M139).

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Keywords: Electrospun nanofiber, Oxygen sensor, Palladium(II) Platinum(II) meso-Porphyrin, Poly(1-trimethylsilyl-1-propyne).Phosphorescence, Silver nanoparticle

P-123

SPECIFICITIES OF PHASE EQUILIBRIUM IN THE $In_2Te_3CuCr_2S_4$ SYSTEM

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Chalcogenides of copper and medium, as well solid solutions on their base are thermo-and photoelectric materials for the transformers of energy. On the other hand, the $CuCr_2S_4$ compound is related to the class of ferromagnetic semi-conductors. That's why they are also perspective for creation of the elements they consist of [1,2]. Therefore, on studying phase equilibrium in the In_2Te_3-$CuCr_2S_4$ system it is possible to expose the compound materials actual for instrument making. Proceeding from the results of physic-chemical analyses we've plotted a state diagram of the In_2Te_3-$CuCr_2S_4$ system, it was found that the system is quasbinary, near the initial components the reactions of complicated character with the formation of solid solutions take place. The $CuCr_2S_4$ compound based alloys start their crystallization from crystallizing Cr_2S_4, then till the temperature 753 K phase $y + Cr_2S_4$ is being crystallized where y phase corresponds to solid solutions based on $CuCr_2S_4$, such solid solution at 300 K has a boundary to 2 mol%. Simultaneously, beginning from temperature 1483 K in the system 3-phase equilibrium L+Cr_2+S_3+y takes place. On side of In_2Te_3 compound initially L+ phase is crystallized where β is high-temperature modification of In_2Te_3 compound.

Thermodynamical parameters of $CuCrS_4$ compound and solid solutions on its base with a formula $(CuCr_2S_4)_{1-x}(In\text{-}Te_3)_x$ have been calculated. Thermodynamical functions of the source [3]. It is brought light that $CuCr_2S_4$ compound has a standard entropy S°_{298} = 211 Jol/mol·K, and entropy of the formation is equal to S°_{298} = -13 Jol/mol·K, sign of the formation of a free energy of solid solutions $(CuCr_2S_4)_{1-x}(In_2Te_3)_x$ is negative that indicates to the relative stability of the these alloys.

Similar assumption is also confirmed in dependences of thermophysical propercites on physico-chemical parameters. It is known that dependence of thermal conduction on microhardness is an indicator of chemical bond.

Measurements showed that increase in composition of solid solutions $(Cu\ Cr_2S_4)_{1-x}(In_2Te_3)_x$ a quantity of $In_{2-}Te_3$ simultaneously lowers value of phonon thermal conduction and microhardness. Hence it points to weakening chemical bond at passage form $CuCr_2S_4$ compound to solid solutions $(CuCr_2S_4)_{1-x}(In\text{-}Te_3)_{x.}$ Increase in atomic mass at passage from the compound $CuCr_2S_4$ to solid solutions $(CuCr_2S_4)_{1-x}(In\text{-}Te_3)_x$ testifies in favour of the started as well.

Keywords: phase diagram, solid solutions, thermodynamical parameters, phonon thermal condition.

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Keywords: phase diagram, solid solutions, thermodynamical parameters, phonon thermal condition

P-124

Zn(II)-COORDINATION POLYMER CONSTRUCTED FROM 3,3',5,5'-AZOBENZENETETRACARBOXYLIC ACID AND 1,4-BIS(2-ISOPROPYLIMIDAZOL-1-YLMETHYL)BENZENE

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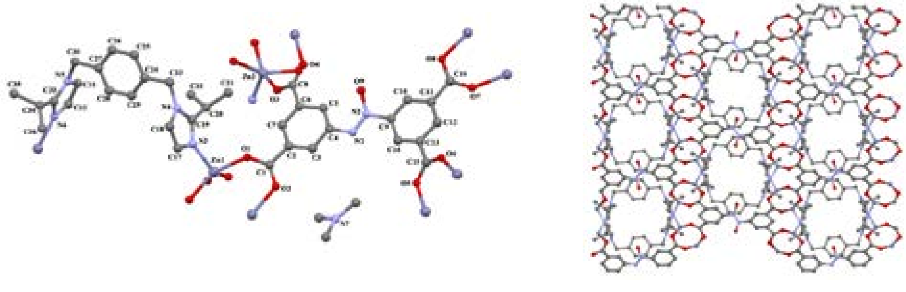
In recent years, a great deal of attention has focused on the rational design and construction of coordination polymers owing to their diverse application areas e.g. gas adsorption/separation, catalyst, luminescence, iodine encapsulation, drug delivery, etc., and their fascinating architectures[1,2]. Until now, although a large number of coordination polymers have been synthesized and characterized, it has still been challenged to rationally synthesize targeted structures. In this study, $\{[Zn_2(abtc)(1,4\text{-bisobix-})]\cdot DMF\}_n$ (1) (abtc: azobenzenetetracarboxylate, 1,4-bisobix: 1,4-bis(2-isopropylimidazol-1ylmethyl) benzene) was synthesized and characterized by elemental analysis, IR spectrum, single crystal X-ray diffraction and thermal analysis (TG/DTA).

Complex **1** was prepared by the reaction of $ZnCl_2$, H_4abtc and 1,4-bisobix in the mixture of DMF:H_2O (10:2) in the presence of HNO_3. X-ray analysis reveals that **1** crystallizes in the orthorhombic system with the space group Pna21. There are one Zn(II) ion, one abtc, one 1,4-bisobix ligand and one DMF molecule in the asymmetric unit of **1** (Fig. 1a). Each Zn(II) ion which has distorted square pyramidal geometry is coordinated by four carboxylate O atoms from four abtc ligands and two imidazole N atoms from two different 1,4-bisobix ligands. A pair of Zn(II) ions is connected by four carboxylate O atoms to generate paddlewheel $\{Zn_2(CO_2)_4\}$ binuclear SBUs with a Zn···Zn distance of 3.089 Å. Each $\{Zn_2(CO_2)_4\}$ binuclear SBU is connected by four different abtc ligand to form 3D framework (Fig. 1b). According to PLATON analysis, the solvent-accessible volume for **1** is 18.0 %. Topologically, complex **1** has 3,6 –connected sqc5381 net with the point symbol of $\{4^2.6\}_2\{4^4.6^6.8^5\}$. Moreover, thermal and photoluminescent properties of complex **1** were studied in detail.



(a) **(b)**

Figure 1: (a) The molecular structure and (b) 3D framework of **1**

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Keywords: Azobenzenetetracarboxylic acid, Coordination polymer, 3D framework, Zn(II)-complex

P-125

PREPARATION OF CATHODE MATERIALS BASED ON POLYPHOSPHAZENE AND INVESTIGATION OF POTENTIAL USAGE IN RECHARGEABLE LI-ION BATTERIES

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Li-ion batteries have high energy and power density. During high current charging or discharging, mass transfer limitations and other factors increase the cell temperature and thus the energy density and cycle life of the battery are decreased[1].

Another class of cathode materials of rechargeable lithium-ion batteries is redox-active and stable radical polymers which are alternative to inorganic metal oxide cathodes. Energy density of radical cathode materials in lithium ion batteries can be increased by increasing the number of the radicals on per monomer unit[2].

In this study, we aimed to synthesize and characterization of nitrogen-oxide radical group carrying polyphosphazenes and investigation of their potential usage in rechargeable lithium-ion battery as cathode active material. The designed novel polymers have superior thermal and oxidative resistance against to the present organic analogues which are due to the inorganic nature of the main polymer chain which is expected to provide long battery life. Furthermore the high concentration of radical groups per monomer is expected to provide a high energy density. For this purpose radical nitrogen-oxide group polyphosphazenes carrying were prepared and the structures of the polymers were characterized with standard spectroscopic techniques. The magnetic and the radical properties were examined by electron spin paramagnetic resonance (EPR) spectroscopy and cyclic voltammetry (CV) method, respectively. The polymers were tested as cathode active material for rechargeable lithium batteries.

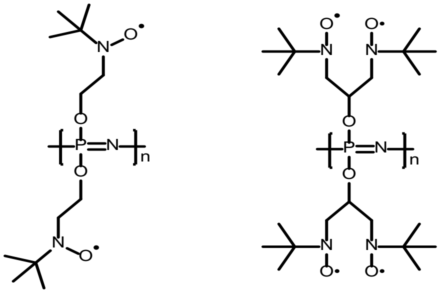

Figure1. Chemical structures of radical polymers synthesized in this study

Acknowledgements: This work was supported by the Scientific and Technological Research Council of Turkey (TUBITAK), Project Number 114Z762.

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Keywords: Polyphosphazene, Polyradical, Organic Battery, Lithium battery

P-126

SYNTHESIS OF BODIPY CONTAINING CYCLOTRIPHOSPHAZENE AND MEASURE OF THE SINGLET OXYGEN GENERATION

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The cyclophosphazenes are an important class of inorganic heterocyclic ring systems in fundamental and applied science. They have wide applications such as anti-cancer agents, fluorescence metal probes, liquid crystals, electrical conductivity, hydraulic fluids and lubricants [1, 2]. Boron dipyromethene (BODIPY) and Its derivatives possess a great value in last decade due to their unique properties. They have widespread applications such as laser dyes in biological sensors owing to their high fluorescence efficiency in both solution and solid state and photosensitizers in photodynamic therapy (PDT) of cancer due to their high photo, chemical and termal stability [3].

In the present study, new Bodipy -containing cyclotriphosphazene is synthesized by click reaction. The structural investigation of new compound is verified by ^{1}H, ^{13}C, ^{31}P NMR spectroscopies, and UV–vis electronic absorption spectra. The florescence property, singlet oxygen generation capability and appropriate photo degradation by light irradiation of new BODIPY substituted cyclotriphosphazene is evaluated. We have demonstrated that cyclotriphosphazene derivatives can be prepared which act as effective photosensitizer.

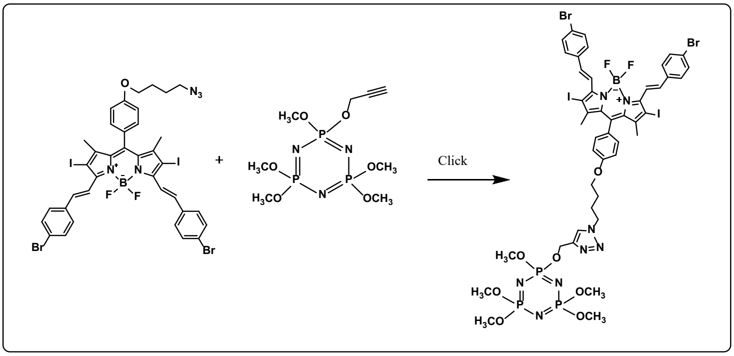

Figure 1: The structure of the BODIPY substituted cyclotriphosphazene

Acknowledgements: This work was supported by the Scientific and Technological Research Council of Turkey (TUBITAK), Project Number 114Z445.

References:

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Keywords: Bodipy, cyclotriphosphazene, singlet oxygen

P-127

SYNTHESIS AND CHARACTERIZATION OF N-((6-METHYLPYRIDIN-2-YL) CARBAMOTHIOYL)THİOPHENE-2-CARBOXAMIDE ANDI Co(II), Ni(II) AND Cu(II) COMPLEXES: CALCULATING OF MOLECULAR ORBITALS, ANTIOXIDANT AND ANTITUMOR ACTIVITIES

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N-((6-methylpyridin-2-yl)carbamothioyl)thiophene-2-carboxamide, $C_{12}H_{11}N_3OS_2$ (HL) (Fig.1) and its Co(II), Ni(II) and Cu(II) complexes (ML_2 type) have been synthesized and characterized by elemental analysis, FT-IR ,^{1}H-NMR and HR-MS methods. HL was also characterized by single crystal X-ray diffraction study. The HL crystallizes in the monoclinic crystal system with $P\ 1\ 2_1/c\ 1$ space group, Z=4, a=7.2326(8) Å, b=18.3492(16) Å, c=9.7724(9) Å. The [ML_2] complex structures were optimized using B97D/TZVP level. Molecular orbitals of HL ligand was calculated at the same level. The complexes were screened for their anticancer and antioxidant activities. Antioxidant activity of the complexes were measured by using the DPPH (2,2-diphenyl-1-picrylhydrazyl) and ABTS (2,2′-azinobis-(3-ethylbenzothiazoline-6-sulfonic acid) assays. Anticancer activity of the complex were studied MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) assay in MCF-7 (Michigan Cancer Foundation-7) breast cancer cells.

Figure 1. ORTEP view of the HL; thermal ellipsoids are shown at the 50% probability level.

Acknowledgements: This work was supported by Kahramanmaraş Sütçü İmam University Research Fund (BAP-project no:2013/4-28M). We also thank TUBITAK ULAKBIM, High Performance and Grid Computing Center (TR-Grid e-Infrastructure) for the calculations.

References:

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Keywords: Synthesis; Thiourea; Complex; Single crystal, Molecular orbital, B97D/TZVP level

P-128

SYNTHESIS AND CHARACTERIZATION OF N-((2-CHLOROPYRIDIN-3-YL)CARBAMOTHIOYL)THIOPHENE-2-CARBOXAMIDE AND ITS Co(II), Ni(II) AND Cu(II) COMPLEXES: CALCULATING OF MOLECULAR ORBITALS, ANTIOXIDANT AND ANTITUMOR ACTIVITIES AND ELECTROCHEMICAL BEHAVIOR

Tuncay YEŞİLKAYNAK[1], *Harun MUSLU*[1], *Celal ÖZPINAR*[2], *Fatih Mehmet EMEN*[3]

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N-((2-chloropyridin-3-yl)carbamothioyl)thiophene-2-carboxamide, $C_{11}H_8ClN_3OS_2$ (HL) (Fig.1) and its Co(II), Ni(II) and Cu(II) complexes (ML_2 type) have been synthesized and characterized by elemental analysis, FT-IR, ^{1}H-NMR and HR-MS methods. HL was also characterized by single crystal X-ray diffraction study. The HL crystallizes in the orthorhombic system with P 21 21 21 space group and Z=4, and its unit cell parameters are a=3.8875(3) Å, b=14.6442(13) Å, c=21.8950(19) Å. The [ML_2] complex structures were optimized using B97D/TZVP level. Molecular orbitals of HL ligand was calculated at the same level. The complexes were screened for their anticancer and antioxidant activities. The antioxidant activity of the complexes was measured by using the DPPH (2,2-diphenyl-1-picrylhydrazyl) and ABTS (2,2′-azinobis-(3-ethylbenzothiazoline-6-sulfonic acid) assays. The anticancer activity of the complex was studied MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) assay in MCF-7 (Michigan Cancer Foundation-7) breast cancer cells.

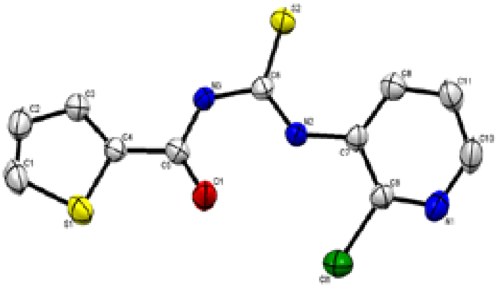

*Figure 1***.** ORTEP view of the HL; thermal ellipsoids are shown at the 50% probability level.

Acknowledgements

This work was supported by Kahramanmaraş Sütçü İmam University Research Fund (BAP-project no:2013/4-28M). We also thank TUBITAK ULAKBIM, High Performance and Grid Computing Center (TR-Grid e-Infrastructure) for the calculations.

References:

[1] Yeşilkaynak, T.; Flörke, U.; Külcü, N. and Arslan, H. Acta Cryst. **2006**, E62, 3934-3935.
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Keywords: Synthesis; Thiourea; Complex; Single crystal structure, Molecular orbital

P-129

SYNTHESIS AND CHARACTERIZATION OF Zn(II), Ni(II), Mn(III) COMPLEXES OF DIIMINE LIGAND DERIVED FROM 2-HYDROXY-1-NAPHTHALDEHYDE AND SALICYLALDEHYDE

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Salens or salophens and their complexes with transition metals are known, as is their ability to catalyse several transformations of organic molecules. Especially notable has been their use in catalytic asymmetric epoxidation of non-functionalized olefins [1]. The interest in the design, synthesis and characterization of the transition metal complexes of unsymmetrical Schiff base ligands has come from the realization that coordinated ligands around central metal ions in natural systems are unsymmetrical. They appear to be of importance for a broad range of transition metal catalyzed reactions including lactide polymerization. Unsymmetrical Schiff base ligands have clearly offered many advantages over their symmetrical counterparts in the elucidation of the composition and the geometry of the metal ion binding sites in the metallo-proteins and the enzymes, and the selectivity of the natural systems with synthetic materials [2].

In the first step of our study, ONN donor monoimine ligand, 2-hydroxy-1-naphtylidene-3,4-diaminobenzophenone (NADAB), was obtained by the reaction of 3,4-diaminobenzophenone with 2-hydroxy-1-naphthaldehyde in the methanol medium according to the methods reported previously [3]. Then, asymmetric diimine ligand (L; ONNO donor) was obtained from the reaction of salicylaldehyde and NADAB. In the second step, metal complexes of L was synthesized by using Zn(II), Ni(II) and Mn(III) metal salts. The structure of the whole obtained compounds were characterized by elemental analysis, IR, ^{1}H-NMR, UV-Visible and ESI-Mass techniques.

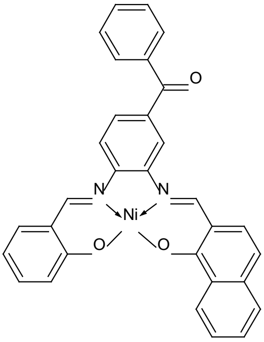

Figure 1: Molecular structure of Ni(II) complex.

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Keywords: Diimine Ligands, Schiff Bases, Salen Complexes, 3,4-Diaminobenzophenone

P-130

THE SYNTHESES AND STRUCTURAL CHARACTERIZATIONS, ANTIMICROBIAL AND IN VITRO DNA BINDING OF 4-FLUOROBENZYLSPIRO(N/O)CYLOTRIPHOSPHAZENES AND THEİR PHOSPHAZENIUM SALTS

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Cyclophosphazenes are one of the most studied compounds in the family of inorganic heterocyclic ring systems, all of which contain phosphorus and nitrogen atoms linked alternately each other [1]. The hexachlorocyclotriphosphazene, $N_3P_3Cl_6$, is the best known and standard compound in the field of phosphazene chemistry. Various cyclotriphosphazene derivatives were synthesized by the reacting with different nucleophiles [2]. There are several studies in the literature on the reactions of cyclotriphosphazenes with NO donor type difunctional reagents [3]. The ability of the cyclotriphosphazene bases to form stable salts with HCl, HF, $HClO_4$ and CH_3COOH has been known for years [4]. But, it was considerably difficult to obtain the solid state and crystalline forms of the phosphazenium salts. Thus, the crystalline structures of the very limited number of phosphazenium salts could be solved by X-ray diffraction techniques [5,6].

In this study, the condensation reaction of $N_3P_3Cl_6$ (**1**) with sodium 3-(4-fluorobenzylamino)-1-propanoxide gave partly substituted 4-fluorobenzylspirocyclotriphosphazene (**2**). The Cl replacement reactions of **2** with excess monoamines led to the formation of the 4-fluorobenzylspiro (N/O)tetraaminocyclotriphosphazenes (**3a**-**3d**). The phosphazenium salts (**4a**-**4d**) were obtained from the reactions of the corresponding phosphazene bases (**3a**-**3d**) with gentisic acid in THF (Figure 1). The structures of all the isolated cyclotriphosphazene derivatives were determined by elemental analyses, FTIR and ^1H, $^{13}C\{^1H\}$, $^{31}P\{^1H\}$ NMR techniques. All the compounds were screened for antibacterial and antifungal activities against bacteria and yeast strains. The interactions of the compounds with supercoiled plasmid pBR322 DNA were investigated.

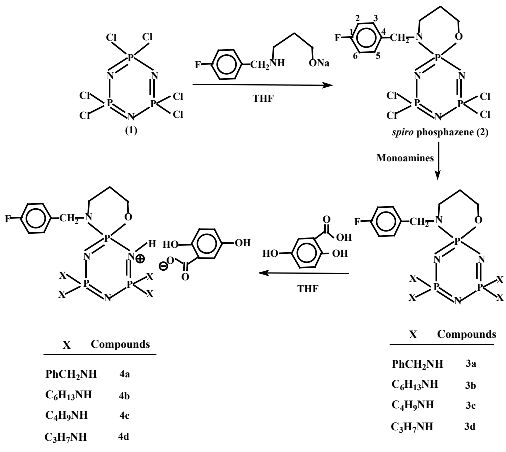

Figure 1: The expected phosphazene derivatives and their phosphazenium salts

References:

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Keywords: Phosphazene salts, Spectroscopy, DNA binding, Antimicrobial activity

P-131

NEW SCHIFF BASE COMPOUND SYNTHESIS: INVESTIGATION OF ITS ELECTROCHEMICAL, PHOTOLUMINESCENCE AND THERMAL PROPERTIES

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2-Aminothiophene derivatives have been used in a number of applications in pesticides, dyes and pharmaceuticals[1]. Schiff bases form an interesting class of chelating ligands that has enjoyed popular use in the coordination chemistry of transition, inner-transition and main group elements [2].

Schiff base compounds are an important class of compounds both synthetically and biologically. These compounds show biological activities including antibacterial, antifungal, anticancer and herbicidal activities [3].Furthermore, Schiff bases are utilized as starting materialsin the synthesis of compounds of industrial.

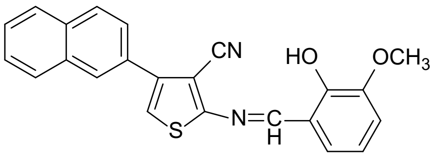

Figure 1: Schiff base

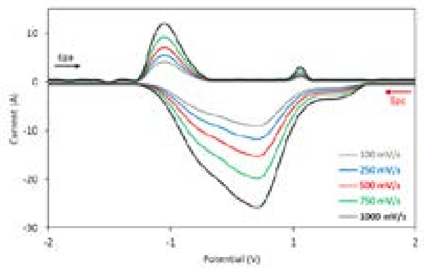

Figure 2: Schiff base Cyclic Voltommogram

New Schiff Base Compound Synthesis and structure was illuminated using a spectroscopic methods such as ^{1}H- NMR, ^{13}C-NMR, IR, UV-Vis, Additionally, electrochemical, thermal and luminescence properties of the compound was investigated.

Acknowledgements: We wish to thank to Kahramanmaraş Sütçü İmam University research fond for the financial support Project Number : 2012/4-17

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Keywords: Schiff Base, 2-Aminothiophene, electrochemical

P-132

SCHIFF BASE AND METAL COMPLEX SYNTHESIS AND CHARACTERISETION, INVESTIGATION OF ITS PROPERTIES SOLID-LIQUID UV AND SOLID-LIQUID LUMINESCENCE

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Schiff bases are used as substrates in the preparation of a number of industrial and biologically active compounds via ring closure, cycloaddition, and replacement reactions. [1] In the early days, the main efforts were directed towards the synthesis and characterization of rather fundamental complexes, which do not look striking nowadays, but were strongly needed in those days. Moreover, Schiff bases are also known to have biological activities, such as antimicrobial, antifungal, antitumor and as herbicides.[2] Schiff bases have also been employed as ligands for complexation of metal ions.[3]

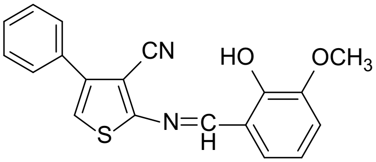

Figure 1: Schiff Base Ligands

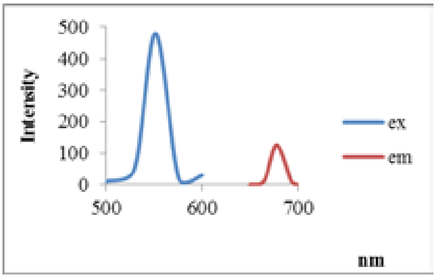

Figure 2 : Schiff Base Ligands solid luminescence

In This Study; Schiff Base Compound and its metal complex synthesis, characterised by ^{1}H- NMR, ^{13}C-NMR, IR, Solid-Liquid UV-Vis, thermal and solid-liquid luminescence properties of the compound and metal complexes.

Acknowledgements: We wish to thank to Kahramanmaraş Sütçü İmam University research fond for the financial support Project Number : 2012/4-17

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Keywords: Schiff Base, thermal, Solid luminescence

P-133

NEW AND EFFECTIVE TIN CATALYST and ITS CATALYTIC ACTIVITY OVER POLYMERIZATION OF ε-CAPROLACTONE

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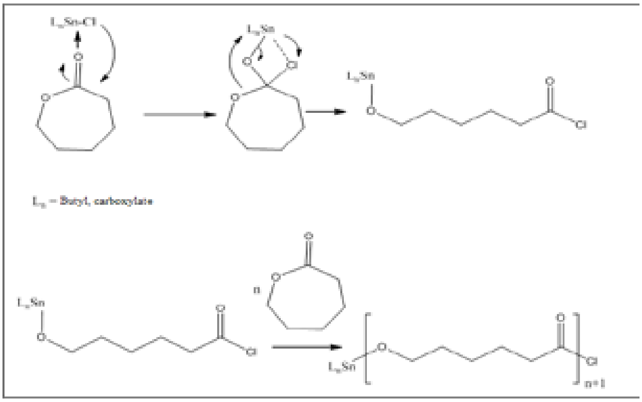
Firstly, potassiumpivalate precursor was prepared by reaction between pivalic acid and potassium hydroxide as in literature. Secondly, tin-pivalate catalyst was prepared by reaction between potassiumpivalate and $BuSnCl_3$ in ethanol. In order to see its catalytic activity, this compound was tested in polymerization of ε-caprolactone and was effective. All these compounds were characterized by ^1H, ^{13}C NMR, FT-IR, mass spectroscopies, and elemental analysis. ($C_{28}H_{54}Cl_2O_8Sn_2$, M_w=827,04 g/mol) Calculated: C: 40,66; H: 6,58%. Found: C: 40,10; H: 6,40%.

TOF MS ES^+ (ethanol): 873,05 Da $[((CH_3)_3CCOO)_4Sn_2Cl_2(C_4H_9)_2+C_2H_5OH+H]^+$, 756,96 Da $[((CH_3)_3CCOO)_4Sn_2(C_4H_9)_2+H]^+$, 538,93 Da $[((CH_3)_3CCOO)_2Sn_2(C_4H_9)(CH_2CH_2CH)+H]^+$. ^1H-NMR, $CDCl_3$, ppm, δ: 0,94 (t, 6H, δ-CH_3); 1,21 (s, 36H, $C(CH_3)_3$); 1,45 (m, 4H, γ-CH_2); 1,69 (m, 4H, β-CH_2); 1,83 (t, 4H, α-CH_2). ^{13}C-NMR, $CDCl_3$, ppm, δ: 13,64 (δ-CH_3); 25,52 (γ-CH_2); 27,11 (β-CH_2); 41,5 (α-CH_2); 27,41 ($C(CH_3)_3$); 188,3 (COO); 186,9 (COO bridge). FT-IR (cm^{-1}) : 2965, 2930, 2870, 1553, 1484, 1423, 1371, 1227, 880, 786, 686 . [Sn-$^{\alpha}CH_2{}^{\beta}CH_2{}^{\gamma}CH_2{}^{\delta}CH_3$].

Addition to these, poly-caprolactone (PCL) was also characterized by gel permeation chromatography (GPC).



Polymerization mechanism of ε-caprolactone

RESULT: Tin-pivalate catalyst was very effective over polymerization of ε-capro lactone in solventless environment.

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Keywords: Catalysts, Metal, Polymer, Catalysi

P-134

THE SYNTHESIS OF METHYL, METHOXYETHYL, TRIFLOROETHYL AND PROPARGYL GROUPS CONTAINING PHOSPHATES TO BE USED AS SOLVENT OR ADDITIVE IN LITHIUM-ION BATTERIES

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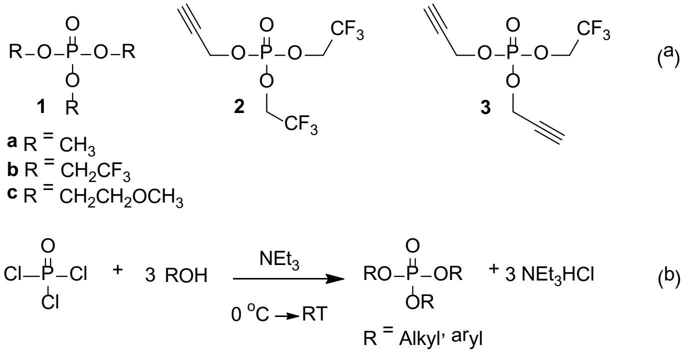
A phosphate or phosphate ester is the general name for esters of phosphoric acid. Many of the most important biochemicals are phosphates, including DNA and RNA, as well as many of the cofactors essential for life. Phosphates alongside their biological importance, they attract the attention of scientists due to their applications in different areas. They find numerous applications as plasticizers, flame retardants, reagents for the preparation of organophosphorus polymers, in solvent extraction of heavy metal cations, as insecticides, and in nerve gases [1]. Especially in recent years, due to their flame-retardant properties phosphates are used as electrolyte solvents or additives in lithium-ion batteries. In commercial lithium-ion batteries the used ether- or carbonate-based organic solvents are all flammable. Therefore, attention has recently been focused on improving the existing features of these electrolytes by using different phosphorous containing compounds as solvent or additive in these batteries [2].

In this study, the synthesis of phosphates were aimed to be used as electrolyte solvent (**1a—c**) or additive (**2** and **3**) in lithium-ion batteries (Scheme 1: (a)]. For this purpose, phosphates **1a—c** [3-4] were synthesized starting from phosphoryl chloride and the corresponding alcohol (R = CH_3, CH_2CF_3 and $CH_2CH_2OCH_3$) in the presence of trimethylamine at 0 ˚C according to the general method [Scheme 1: (b)]. On the other hand, new phosphates **2** and **3** having two substituents were obtained in two steps by subsequent addition of 2,2,2-trifluoroethanol and propargyl alcohol in different equivalency under the same reaction conditions.



Scheme 1: (a) The general method for phosphate synthesis, (b) Structures of phosphates **1a-c**, **2** and **3**

Acknowledgements: This work is supported by Ahi Evran University (FEF.A3.16.016).

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Keywords: phosphate, synthesis, electrolyte additive, electrolyte solvent

P-135

ELECTRICAL AND PHOTOELECTRICAL BEHAVIOUR OF HETEROJUNCTIONS BASED ON Ru(II)-PHOSPHINITE COMPLEXES

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Conductive and semiconducting organic materials have been a focus of interest for last few decades [1]. Organic materials have been preferred in device applications because of their key advantages including large area coating, using on flexible substrates and low cost [2]. One of the gorgeous features of organic materials is that they are convenient for band gap engineering, i.e. tunable conduction and valence band energies and charge transport. Recently there have been many reports in the literature that organic conducting polymers or organic semiconductors could be used as interlayer to obtain rectifying junctions between metal and inorganic semiconductor [3].While some studies have concentrated on finding suitable metal complexes for device technology [4], others have focused on the usage of these compounds in the fabrication of devices including solar cells, Schottky diodes and light emitting diodes [5, 6].

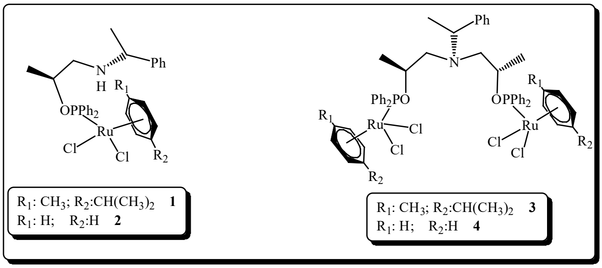

Figure 1 Complexes **1-4**

In present study, Optical and electrical properties of the complexes were investigated. All compounds showed indirect band gaps and they can be accepted as being in the semiconductor class. Organic–inorganic hybrid devices were obtained using n-Si inorganic semiconductor and the complexes. The characteristic parameters of the devices were determined using current–voltage (I–V) and capacitance–voltage measurements in the dark. Photoelectrical properties of the devices were investigated using I–V measurements under a solar simulator with an AM1.5 global filter.

Acknowledgement: This study was supported by The Scientific and Technological Research Council of Turkey (**113Z297**).

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Keywords: Photoelectrical Behaviour, Phosphinite, Semiconductor

P-136

INVESTIGATION OF PHOTOLUMINESCENCE PROPERTIES FOR SYNTHESIZED BENZO THIO CROWN ETHERS

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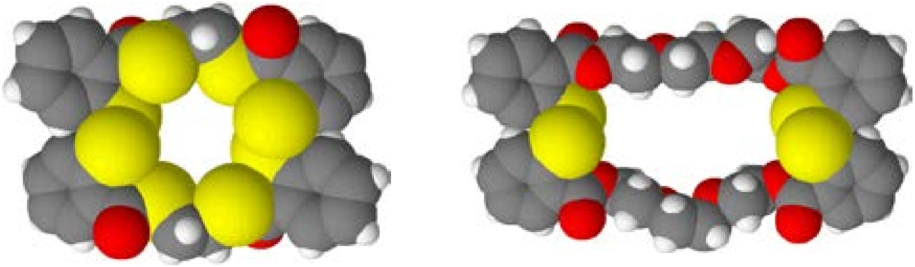
Synthesis of sulfur containing benzo thio crown ethers populared by Pedersen began to interest in 1970-1980s. Tanaka et al in 1972-1973 years [1-2], Bute in 1981 and Kellogg [3] begins to synthesis of benzo crown ether derivatives in 1990s. The increase of benzene ring and number of heteroatoms caused to different characteristics and these properties is entirely compatible with the interest of the different metal cations, the importance of the compound where together of these groups is extremely attractive [4]. Although, the synthesis of thio crown ethers generally takes long reaction time, esterification-ring closure reaction with acyl chloride is faster [5].

The photoluminescence method exploits luminescence emitted by organic chromophore material. Ligands are prepared by KBr pellets which may be stimulated by any of a variety of means to luminesce, i.e. emit light. Certain characteristics of the emitted light change with temperature, including brightness, color, and afterglow duration. The latter is most commonly used for temperature measurement. In our study completely original compounds (UB1, UB2, UB3, UB4, UB5, UB6 and UB7) were synthesized with "High Dilution" method [5]. After purification and characterization photoluminescence properties of the compound were determined. Photoluminescence properties are important for organic compounds because of availability to organic light emitting diodes (OLED). Synthesized compounds have highest conjugation and emit large quantities with different color lights.



UB1 UB6

Figure 1: Ring cavities for synthesized UB1, UB2, UB3, UB4, UB5, UB6 and UB7 compounds

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Keywords: Benzo thio crown ether, Physical organic chemistry, Luminescence

P-137

THE SUPPORT MATERIAL EFFECT ON THE PERFORMANCE OF MONODISPERSE Fe_3O_4 NANOPARTICLES AS ANODE MATERIAL FOR THE RECHARGEABLE LITHIUM-ION BATTERY

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Rechargeable Li-ion batteries (LIBs) benefiting from high specific energy and high rate capability, have been widely used in portable electronic devices and electric vehicles over two decades [1,2]. A typical LIB cell consists of an anode, cathode and the separator with an electrolyte that allows Li^+ ions diffusion from anode and cathode of the cell. However, the capacity of the state-of-the-art Li-ion batteries have to be upgraded considering the increased high-stored energy needs for present-day's mobile electronic devices such as smart phones, laptops and tablets. Therefore, a much effort has been devoted to search for alternative active materials to design affordable LIBs with a much larger energy density than the present ones by retaining the cycle life at an acceptable rate in safe. In this context, nanomaterials, especially oxide nanoparticles, were found to be highly active materials for the battery applications. In this regard, FeO, NiO, CuO and CoO nanoparticles having size of 1-5 nm has been found to have energy capacities of 600-800 mAh g^{-1} [3].

We report herein the preparation and the electrode performance of monodisperse Fe_3O_4 nanoparticles supported on various commercial carbon supports, namely Vulcan XC-72, Super P, Black Pearl 2000 and their hybrid mixtures for the LIBs. Monodisperse Fe_3O_4 nanoparticles were synthesized by using a surfactant-assisted organic solution phase protocol comprising the thermal decomposition of iron(III) acetylacetonate in oleylamine in the presence of benzyl ether. The colloidal 8 nm Fe_3O_4 NPs were then supported on various support materials with different loadings (20, 40 and 60 wt % Fe_3O_4 NPs) by using simple liquid phase self-assembly method and characterized by TEM, XRD and ICP-MS. The electrode performances of all carbon-Fe_3O_4 composites were evaluated by galvanostatic charge/discharge tests by assembling the coin cells using lithium metal as a cathode material. Vulcan-Fe_3O_4, Super P-Fe_3O_4, Black-Fe_3O_4, Super+Vulcan-Fe_3O_4, Black+Vulcan-Fe_3O_4 composites with 40 wt% loading showed the first discharge capacities of 973, 717, 1167, 1048 and 1469 mAh g^{-1} at 50 mA g^{-1}, respectively. Among the all tested composites, Black Pearl 2000 + Vulcan-Fe_3O_4 composite provided the highest discharge capacity of 749 mAh.g^{-1} at 100 mA g^{-1} after 20 cycles.

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Keywords: Black Pearl 2000, electrode material, Fe3O4 nanoparticles, Lithium-ion battery, Super P, Vulcan XC-72

P-138

PHOTOVOLTAIC PERFORMANCE OF TWO NEW METAL FREE D-Π-A SENSITIZERS

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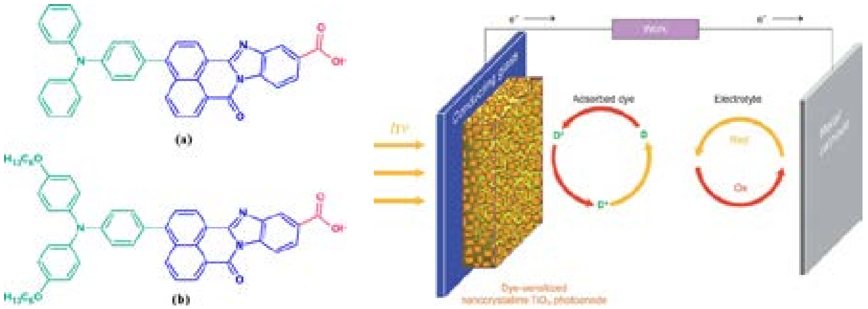
Dye sensitized solar cells (DSSC) have gained considerable attention in recent years in academic and industrial area owing to its low-cost, developed conversion efficiency and useful application methods[1]. Mainly, the efficiency measurements of dye sensitized solar cells are formed in liquid electrolyte (I^-/I_3^- redox couple). Recently, organic dyes containing electron-rich and electron-poor sections connected via a conjugated (π) bridge have been proposed as new candidates for high-efficiency DSSCs, replacing costly sensitizers containing the rare metal ruthenium[2-3]. The “push–pull” architecture of these “donor–π–acceptor” (D–π–A) molecules facilitates the spatial separation of electrons and holes and thus decreases their recombination rate. Inexpensive, metal-free thiophene-based molecules with D–π–A structures have given promising results, providing efficiencies of up to 7% and high open-circuit voltages[2-5].

In this work, the synthesis, electrochemical and photovoltaic properties of two D-π-A organic sensitizers, having triphenylamine as electron donor (with or without additional electron donating hexyloxy group), carboxylic acid as electron acceptor and benzimidazole group as π-bridge, will describe.



a) b)

Figure 1: a) Chemical structures two dyes b)A schematic representation of a dye-sensitized solar cell, emphasizing the redox cycles of the dye/sensitizer (D, D*, D+) and the electrolyte (Ox/Red) [6].

References:

[1] O’Regan, B.; Gratzel, M.¨*Nature* **1991**, *353*, 737
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Keywords: Donor/π-bridge/acceptor structure, Dye sensitized solar cells, HOMO-LUMO

P-139

HIGH-EFFICIENCY DYE-SENSITIZED SOLAR CELL WITH NOVEL IONIC LIQUIDS CO-ADSORBENT

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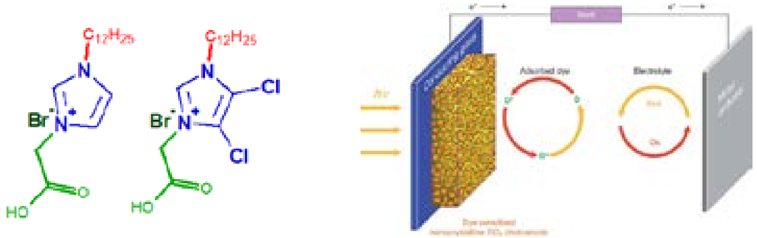
Dye-sensitized solar cells (DSSCs) have drawn a great attention in recent years because of their potential advantages such as simple fabrication process, potentially low cost and high energy conversion efficiency.[1,2] Dye-sensitizers as a key component for light-harvesting and charge injection into the conduction band of TiO2, have been rapidly developed in the past two decades. it is still a hard work to gain a higher photovoltaic performance than that of N749 (black dye, power conversion efficiency (PCE)′ 11.1%) from a single dye-sensitizer, especially for the organic dyesensitizer due to the restricted wavelength range of light absorption. Much effort has been paid to widen the light absorption by increasing the conjugation at both donor[3-5] and π linkages.

Unfortunately, their photovoltaic performances are still not significantly improved due to their aggregation during the photoelectrode fabrication process. The co-sensitizations of organic dyes have been extensively investigated, which exhibit an effective and promising photovoltaic performance.[5-7].

In this work, TiO_2 will be used as a semiconductor and it will be synthesized using related procedures as porous structures. Inoic liquids containing carboxylic acid as co-adsorbent were synthesized and characterized by FTIR, NMR spectroscopies and cyclic voltammetry. The performance of the solar cells will be studied using ionic liquids in different proportions.



a) b)

Figure 1: a) Chemical structures two ionic liquids b)A schematic representation of a dye-sensitized solar cell, emphasizing the redox cycles of the dye/sensitizer (D, D*, D+) and the electrolyte (Ox/Red) [7].

References:

[1] O'Regan, B.; Gratzel, M.¨*Nature* **1991**, *353*, 737
[2] Hagfeldt, A.; Boschloo, G.; Sun, L. C.; Kloo, L.; Pettersson, *H. Chem. Rev.* **2010**, *110*, 6595.
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[7] Elliott, C.M., Dye-sensitized solar cells: Out with both baby and bathwater. *Nature chemistry*, **2011**. *3*: p. 188-189.

Keywords: dye-sensitized solar cells, co-sensitization, power conversion efficiency

P-140

PERFORMANCE OF DYE-SENSITIZED SOLAR CELLS USING IONIC LIQUIDS AS THEIR ELECTROLYTES

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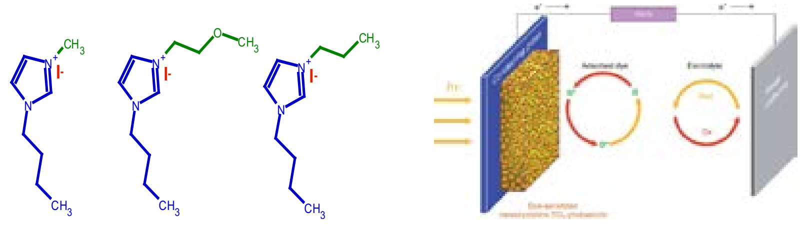
Dye sensitized solar cells (DSSC) have gained considerable attention in recent years in academic and industrial area owing to its low-cost, developed conversion efficiency and useful application methods. Mainly, the efficiency measurements of dye sensitized solar cells are formed in liquid electrolyte (I^-/I_3^- redox couple). The liquid electrolyte allows high electron mass transfer between dye and counter electrode which cause higher efficiency. Nevertheless,liquid electrolytes give rise to several problems with the device, such as electrode corrosion, volatility of electrolyte, difficulties in sealing and short term stability. Nowadays, in some works, solid systems have been used instead of liquid electrolytes. Solvent free ionic liquid electrolyte is demonstrated to be a good choice for DSSC applications because of its thermal stability, high ionic conductivity, non-flammability, negligible vapor pressure and non-toxic as solid state.

In recent years, the ionic liquid electrolyte was improved in speed. The physical and physicochemical properties of 1-alkyl-3-methylimidazolium iodide (alkyl chain: C3–C9) were investigated [1]. It is found that the longer alkyl chain means the more viscose molten salts are, due to van der Waals forces. On the other hand, with increasing viscosity, the conductivity of the molten salts decrease due to the difficulty of diffusion of ions in the viscous liquid. In order to develop the mobility of the redox couple in the electrolyte and the photovoltaic performance, various ionic liquids with low viscosity were improved [2, 3]

In this work, TiO_2 will be used as a semiconductor and it will be synthesized using related procedures as porous structures. 1-Butyl-3-methyl-1H-imidazolium iodide, 1-butyl-3-(2-methoxyethyl)-1*H*-imidazolium iodide and 1-butyl--3-propyl 1H-imidazolium iodide electrolytes will be used as ionic liquid electrolyte.



a) b)

Figure 1: a) Structures of the ionic liquids b)A schematic representation of a dye-sensitized solar cell, emphasizing the redox cycles of the dye/sensitizer (D, D*, D+) and the electrolyte (Ox/Red) [4].

References:

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Keywords: Ionic Liquids, DSSC, Solar Cell

P-141

CAMELLIA SINENSIS LEAF (BLACK TEA) EXTRACT MEDIATED SYNTHESIS OF ZnO NANOPARTICULATE THIN FILM

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Recently, there has been an increasing interest for the improvement of nano sized materials due to their significant electrical and optical properties which are highly useful in producing nano scaledop to electronic and electronic devices with multifunctionality [1].Chemicalmethodsleadtothe presence of some toxic chemicals adsorbed on the surface [2]. Increasing awareness to wards green chemistry has led to the development of an eco-friendly approach for the synthesis of metal oxide-nanoparticles (NPs) [3]. Synthesis of NPs using green approach received much consideration by there searchers due to it is clean, non-toxic, environmentally friendly, free from undesirable by products, gentlereactionmedia, safe, exclusion of engendered waste, loweringthereactiontemperature. Commonly green synthesis processis applied for the synthesis of inorganic nano particles using various biological materials such as microorganisms, marine organisms and plant extracts [4].

In this study, we synthesized ZnO-NPs thin film on microscopeslide using Camelliasinensisleaf (blacktea) extract as a reducing agent via sol-gel spincoating method. Camelliasinensis is a natural source of thein, caffeine, theophylline and antioxidants. The produced thin film was characterize dusing XRD, FEG-SEM, four point probe method and Uv-vis spectrophotometry.

The XRD patterns were indexed on basis of a hexagonal (wurtzite) and the pattern indicate high crystal line quality with very well defined peaks and intense (figure 1.a). FEG-SEM image confirms the formation of nanoparticles and the average grain sizes were calculated to be 50 nm (figure 1.b). From the optical transmittance spectrum (figure 1.c), it is observed that the ZnO-NPs exhibit an avera geopticaltransparency over 79-92 % in visiblerange. Bandgap (E_g) of ZnO-NPs is found to be 3.4eV.

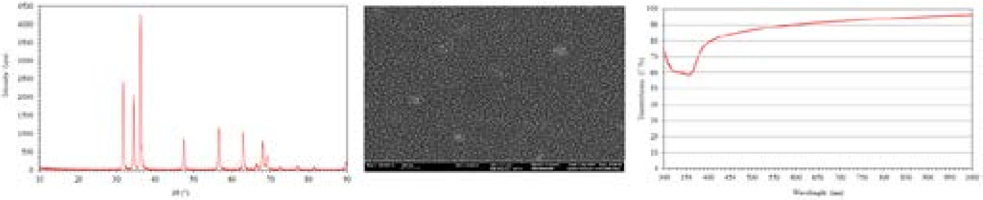
(a) (b) (c)

Figure 1: (a) XRD pattern, (b) FEG-SEM Image, (c) Optical transmittance spectrum of ZnO-NPs.

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Keywords: Thin Film, ZnO, XRD,SEM

P-142

SMART IONIC GELS BASED ON N,N-DIMETHYLACRYLAMIDE WITH ACIDIC COMONOMERS: MODELING SWELLING KINETICS AND EFFECTIVE CHARGE DENSITY

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Much attention has been focused on the preparation of smart ionic gels that undergo large changes in the swelling degree in response to small variations in the external conditions [1-2]. In the present work, the design of smart ionic hydrogel matrix with good extent of swelling having a fast response to change in pH was aimed and the smart ionic gels were synthesized by the crosslinking copolymerization of *N,N*-dimethylacrylamide (DMA) with acidic comonomers. The variations in the pH of the swelling medium induce a change in the degree of ionisation of the electrolyte and, therefore, a change in the swelling capacity of the resulting hydrogel materials [3-5]. Since the presence of charged units in the network chains can significantly affect the elasticity, the swelling capacity as well as the swelling kinetics, the swelling and elasticity behavior of the resulting ionic gels was investigated as a function the ionic group concentration.

This study aims to analyze the experimental swelling data of ionic hydrogels in water using the Flory-Rehner theory to calculate the charge density of networks, which are ineffective in the swelling process. It was shown that this theory correctly predicts the swelling behavior of hydrogels in water if the variation of the effective charge density is taken into account. The effect of incorporating ionic monomer on the extent of equilibrium swelling in water, swelling/deswelling mechanism, response time and pH-dependent swelling behavior has been investigated. The diffusion coefficients have been evaluated for the swelling of the copolymeric hydrogels in buffer solutions. The elastic modulus of the resulting ionic PDMA hydrogels was investigated as a function of the ionic comonomer concentration with satisfactory swelling as well as the charge density.

Acknowledgement

This work was supported by Istanbul Technical University Research Fund.

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Keywords: superabsorbent hydrogel, swelling, Flory-Rehner theory, charge density

P-143

SYNTHESIS AND CHARACTERIZATION OF PET FIBERS GRAFTED WITH BINARY MIXTURE OF 2-METHYLPROPENOIC ACID AND ACRYLONITRILE BY FREE RADICAL: ITS APPLICATION IN REMOVAL OF CATIONIC DYE

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Grafting of binary vinyl monomer mixtures such as 2-methylpropenoic acid (MPA) and acrylonitrile (AN) upon poly (ethylene terephthalate) fibres (PET), was achieved in an aqueous with using benzoyl peroxide (BPO) like free radical initiator. A new reactively fibrous adsorbent was used to removal of dye such as methylene blue (MB) from aqueous media through batch sorption method [1]. Fibers adsorbent was swelled in solution to support the graft and the subsequent polymerization of MPA/AN upon polyester fibers. Optimum conditions for grafting were discovered and reactive fiber were characterized. The use of AN and MPA monomers together in grafting produce a significant increased in the graft yield. Experimental studies showed that the percentage removal of MB was a great higher on the MPA/AN grafted PET (MPA/AN-g-PET) fibers than on the original PET fibers. The adsorbed quantity of MB improved with pH and basic pH was appropriate for the elimination of MB. MPA/AN-g-PET fibers removed 98% of cationic dye when initial concentration diverse from 10 to 80 mg L^{-1} at pH 9.0. Almost all of adsorbed cationic dye was eluted by ethanoic acid in methyl alcohol [2]. Ten removal-desorption cycles indicated that the reactive fibers were favourable for use it again without notable change in removal capacity. Consequently, the MPA/AN-g-PET fibers has demonstrated potential as an effective adsorbent for the extremely effective removal of cationic dyes from aqueous media.

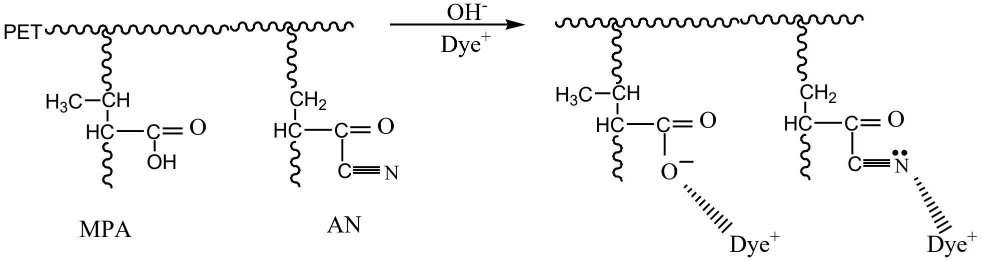

Figure 1 sorption of cationic dye up to the adsorbent

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Keywords: Poly(ethylene terephthalate) fibers, Grafting mixture monomers, Removal Dye

P-144

SYNTHESIS AND STIMULUS-RESPONSE OF POLY(DIMETHYLAMINOETHYL METHACRYLATE-co-2-ACRYLAMIDO-2-METHYL-PROPANOSULFONIC ACID) CRYOGELS

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Porous hydrogels which are sponge-like materials with high toughness and superfast responsivity have attracted great interest in material science, polymer science, bioengineering, tissue engineering, and drug delivery areas. In particular, porous hydrophilic cryogels are produced via cryotropic gelation in which the pre-gel solution containing the starting monomers and the initiator is concentrated in the unfrozen reaction zones of the apparently frozen system and the copolymerization reaction is carried out below the freezing point of the solvent. The gel formation with an open porous structure occurs due to the existence of ice crystals acting as a template for the formation of the pores [1-3]. The porous structure and the resulting physico-chemical properties in cryogels can be controlled by the freezing temperature, the type and concentration of monomers in the initial reaction mixture and the type and content of a crosslinker.

In the present work, N,N-dimethylaminoethyl methacrylate (DMAEMA) as main monomer, 2-acrylamido-2-methyl-propanosulfonic acid (AMPS) as ionic comonomer, diethylene glycoldimethacrylate as crosslinking agent were used and a relatively soft procedure was proposed for the preparation of tough and fast responsive ionic P(DMAEMA-co-AMPS) cryogels in which the tertiary amine containing monomer imparts pH-sensitivity and the ionic comonomer AMPS introduces the ionic moiety in the resulting structure [4]. The equilibrium swelling behavior as well as the elasticity of ionic P(DMAEMA-co-AMPS) cryogels were investigated as a function of the ionic comonomer concentration. It was found that the swelling properties and the elastic behavior of P(DMAEMA-co-AMPS) cryogels drastically change at a gel preparation temperature, below the bulk freezing temperature of the polymerization solvent, water. The uniaxial compression testing showed that P(DMAEMA-co-AMPS) cryogels exhibit larger elastic moduli than the corresponding hydrogels.

Acknowledgement

This work was supported by the Istanbul Technical University Research Fund. (ITU, 38453)

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Keywords: Stimuli-responsive polymer, N,N-dimethylaminoethyl methacrylate, cryogels, elasticity

P-145

TWO-ARMED POLY(ε-CAPROLACTONE)S WITH A 2-[2-(HYDROXYETHOXY)PHENOXY]-1-ETHANOL CORE VIA RING OPENING POLYMERIZATION: SYNTHESIS AND CHARACTERIZATION

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Aliphatic polyesters, prepared by ring opening polymerization (ROP) of lactones and lactides, are versatile polymers having good mechanical properties, hydrolyzability and biocompatibility [1,2]. Poly(ε-caprolactone)(PCL) is a tough, flexible, and biocompatible plastic with a melting point of 61 °C and *T*g much below room temperature. Interest in PCL is mainly due to its miscibilitiy with different commercial polymers, its biodegradability, its ability to adhesiveness [3].

In this work a series of two-armed poly(ε-caprolactone) with different arm length were synthesized via ring-opening polymerization of ε-caprolactone, as a monomer, initiated by 2-[2-(hydroxyethoxy)phenoxy]-1-ethanol(**3**) using $Sn(Oct)_2$ as catalyst at 115 °C. For this purpose (**3**) was prepared by the reaction of catechol and ethylene chlorohydrin (Scheme 1). The synthesized novel compound and polymers were characterized by FTIR, mass spectra, TGA, ^{1}H-NMR, ^{13}C-NMR, GPC, DSC techniques.

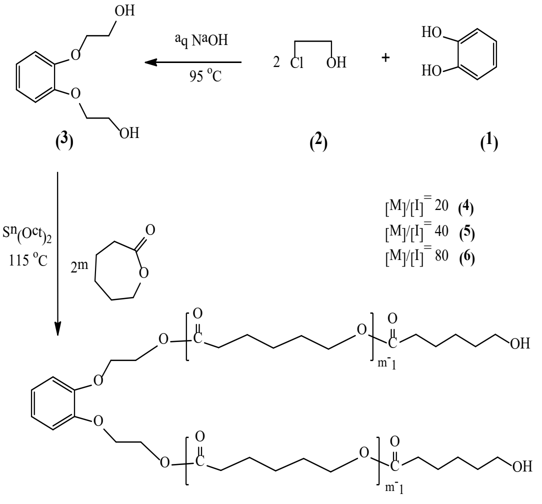

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Figure 1: Synthesis of poly(ε -caprolactone)-based macromonomers

Acknowledgements: This study was supported by Ahi Evran University, Scientific Research Projects (Project no: PYO-MUH.4001.14.008)

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Keywords: Biodegredable polymers, ring-opening polymerization, Poly(ε-caprolactone)s

P-146

INFLUENCE OF POLYMER NETWORK PARAMETERS ON ELASTICITY AND EQUILIBRIUM SWELLING PROPERTIES OF CATIONIC HYDROGELS BASED ON N,N-DIMETHYLAMINOETHLY METHACRYLATE

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Tertiary amino groups carrying (meth)acrylate-based cationic hydrogels have attracted particular attentions because they can undergo abrupt changes between their collapsed and swollen states in response to various environmental stimuli changes, such as pH, temperature, solvent composition, addition of special ions, and electric fields. Poly(N,N-dimethylaminoethylmethacrylate) (PDMAEMA) is both a pH-responsive cationic polyelectrolyte and a thermosensitive polymer with a phase transition temperature in aqueous media which falls in the wide range of 38-50°C. The water-soluble polymers and copolymers of PDMAEMA can be used as antistatic agents, ingredients in hair-care products, suspending agents, soil conditioners, and binders.

In the present work, a series of cationic hydrogels based on N,N-dimethylaminoethyl methacrylate were prepared by free-radical crosslinking copolymerization at 60°C in the presence of diethyleneglycol dimethacrylate (DEGDMA) as the crosslinker and the equilibrium swelling and the mechanical properties of PDMAEMA hydrogels were investigated as a function of gel preparation concentration. Since the crosslinking agent used in the preparation significantly affects the mechanical properties of resulting hydrogel matrix, the uniaxial compression measurements were conducted on the hydrogel samples after their preparation and after equilibrium swelling in water. The characteristic network parameters of PDMAEMA hydrogels such asthe effective crosslink density, the crosslinking efficiency, the network chain length, the average molecular weight between crosslinks and the polymer-solvent interaction parameter were calculated from the equilibrium swelling values using the Flory-Rehner theory. The experimental and theoretical results indicated the importance of the hydrogel preparation concentration in the treatment of the swelling behavior and the elasticity of resulting hydrogels.

*Acknowledgement:*This work was supported by Istanbul Technical University Research Fund.

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Keywords: pH-responsive, thermosensitive, polymer, smart, Poly(N,N-dimethylaminoethylmethacrylate)

P-147

BALANCE WORK OF CADMIUM HEAVY METAL ADSORPTIONS ON VAN PUMICES

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Pumice, accruing as result of volcanic events and durable against chemical factors, is a rock that has porous structure. Pumices have a porous structure because of sudden cooling of the rock and sudden leaving of gases a result of volcanic events. Thanks to these pores, pumices heat and sound insulation are quite high. The most distinctive feature of pumice from other rocks is that it has different colors and there is not crystal water in its porous structure.

Availability of water on the present and future is an issue that interests everyone. Management of water resources for protection water quality and more efficient use of current efforts increase the need for the future.

Cadmium is produced accompanying the production for Zinc metal. Today cadmium is used in industrial nickel /cadmium batteries, against corrosion especially in the coating of steel in shipbuilding industry because of resistance to marine conditions and paint industry. Cadmium is found in phosphatic fertilizers, detergents and refined petroleum products as impurities. It also a significant amount of cadmium pollution results in because of widespread use.

Table 1. Chemical components of Van Pumice experimental purposes we used is as follows.

	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	K_2O	Na_2O	SO_3	Loss on Ignition
Van Pumices	69.00	14.65	2.51	1.11	0.55	3.52	2.48	0.40	4.76

Different temperatures and concentrations of cadmium heavy metal adsorption tests were performed on Van Pumice and were calculated adsorption isotherms and thermodynamic parameters. Adsorption capacity of the pumices has been found from experimental data.

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Keywords: Van Pumices, Cadmium, Toxic substances, Adsorption, Environmental Pollution

P-148

SYNTHESIS, CHARACTERISATION AND INVESTIGATION OF REDOX PROPERTIES OF STABLE NITROXIDE RADICAL CONTAINING PHOSPHAZENE COMPUNDS FOR DYE SYNTHESIZED SOLAR CELLS

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The world's oil reserves are about to diminish and burning of more fossil fuels result to environmental pollution and increasing the greenhouse gas emissions, which results climate change and leads irreversible problems. Solar energy is the source of many forms of renewable energy. While there are many types of photovoltaic cells as the basic working principle is; the photons from the sun's rays result of the stimulation of electrons from a special substance which results production of electrical current [1]. Inorganic silicon-based photovoltaic devices and cells as well as modules require special techniques for the production process. Due to the high costs in addition to the rigid structure of silicon based devices and advancements in conductive/semi-conductive polymers technology leads accelerated research on the field of organic photovoltaic cell technology which can be produced bent-flexible structure and relatively easy production process. When viewed from this point, dye-sensitized solar cells (DSSC), which are easy to manufacture, simple to build and because of cheapness, is one of the most attractive scientific and technological research area [2].

In this study, we aimed to synthesize novel thermally, oxidatively and chemically stable, phosphazene derivatives of stable nitroxide radicals and used them as solid and/or gel electrolytes for dye sensitized photovoltaic cells. The prepared compounds were characterized by spectroscopic technics and liquid, solid and quasi-solid (gel) electrolytes of these radical molecules were used to produce DSSC devices with commercially obtained dye molecules.

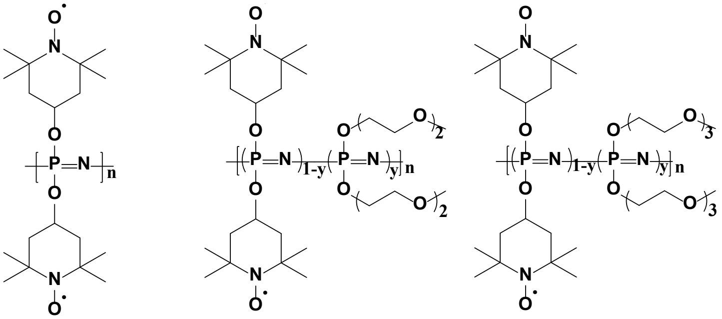

Figure1. Stable Nitroxide Radical Containing Phosphazene Compunds

Acknowledgements: This work was supported by the Scientific and Technological Research Council of Turkey (TUBITAK), Project Number 114Z454.

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Keywords: Radical, Polymer, Phosphazene, Solar Cell

P-149

SELECTIVE REMOVAL OF ASPARAGINE BY USING L-ASPARAGINASE IMMOBILIZED ON STARCH-MODIFIED POLYMERIC COMPOSITES AS COLUMN PACKING MATERIALS

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L-asparaginase (L-ASNase), an enzyme, is an essential drug for the treatment of childhood acute lymphoblastic leukaemia [1]. It catalyses the hyrolysis of L-asparagine to L-aspartic acid and ammonia. Already, polymeric biocomposites have been used as support materials for enzyme immobilization due to porous, large surface area. In this study, we designed a column included L-asparaginase immobilized on starch-modified polymeric composites for L-asparagine removal. For this purpose, we firstly prepared starch-modified poly(methyl methacrylate) P(MMA) via emulsion polymerization. The prepared biocomposites was characterized as structural, thermal and morphological. After, L-asparaginase was immobilized on the composites and the most suitable material was selected as column packing material. The selected packing materials was uniformly packed into a glass column. Stock solution (0.1 M) of L-asparagine was prepared in Tris-HCl and was loaded into the column. The fractions were picked up certain times and was reacted with Nessler reagent. L-asparagine levels in the fractions were determined by using standard graphing. Changes of amount of L-asparagine were measured to evaluate the efficiency of column in the L-asparagine removal from samples. Especially, this column may be find an application area for L-asparagine removal from blood samples.

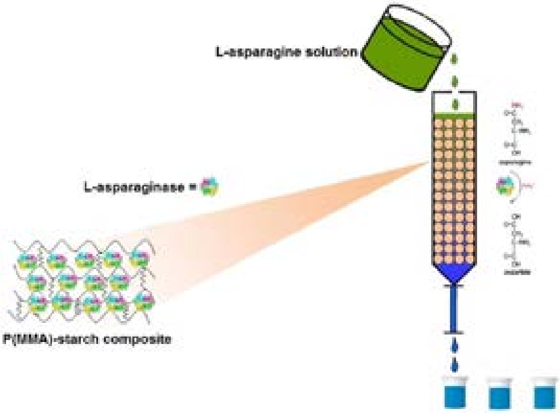

Figure 1: The schematic illustration of removal of L- asparagine by using column system includes immobilized L-asparaginase

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Keywords: L-asparaginase, polymeric composite, enzyme immobilization, column packing material

P-151

PREPARATION AND CHARACTERIZATION OF BORON/STARCH/ GENIPIN COMPLEXES

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Boron is known to form complexes with polyhydroxy compounds such as starch and diols, rapidly and reversibly in aqueous media [1].

Starch is in general, non-toxic, biocompatible, completely biodegradable and abundant natural polymer [2]. By its hydroxyl glucose units, starch readily esterifies inorganic and organic acids, forms ethers and metal derivatives with metal atoms [3].

The properties of starch such as solubility, viscosity, resistance toward acidic medium and heat can be altered positively with cross-linking [4, 5]. Genipin (GNP) is water soluble, stable, biocompatible, non-toxic, bifunctional reagent found in gardenia fruit extract and is an excellent natural cross-linker for starch [6].

In order to develop hydrogels, starch with so many advantages is mixed with polyvinyl alcohol (PVA), a biodegradable and flexible polymer which has good film forming capability [7, 8]. Hydrogels are hydrophilic natured three-dimensional networks, composed with swelling of hydrophilic homopolymers and copolymers in water and so capable of absorbing large amounts of water [9].

In the study, synthesis and characterization of hydrogels of starch/polyvinyl alcohol/boron and powder complexes of starch/boron including genipin as a cross-linker is intended. Boric acid was used as boron source. The synthesized complexes are also compared with boron free samples. All hydrogels and powder complexes are characterized by FTIR, TGA, SEM and XRD methods. Also swelling and degree of solubility tests are performed for hydrogels and powder complexes, respectively.

Acknowledgements: The authors are grateful to the Scientific and Technical Research Council of Turkey (TUBITAK) for 2209-A project.

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Keywords: Starch,Genipin,Boron,Hydrogels,Cross-linking

P-152

A NOVEL ORGANIC-INORGANIC BASED ELECTROACTIVE COPOLYMER

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A new 3,4-ethylenedioxy thiophene (EDOT) based monomer (EDOT-POSS) was synthesized by using polyhedral oligomeric silsesquioxane (POSS) which is an inorganic and nano-sized support group. This EDOT-POSS monomer characterized by using nuclear magnetic resonance spectroscopy (H-NMR) and high resolution mass spectroscopy (HR-MS). The monomer was polymerized electrochemically by mixing with EDOT in different ratios. To understand the effect of the presence of POSS unit on polymer chain, the parent PEDOT polymer was studied under the same conditions. Spectroelectrochemical studies showed that by the addition of EDOT-POSS into PEDOT polymer chain the switching time was decreased (switching time for PEDOT is around 1 sec. while that of copolymer is about 0.7 sec.) and the optical contrast of the related film improved compared to that of PEDOT. Optical contrast for PEDOT is about 47% but for the copolymer it is about 59%. Optical studies showed that the copolymers prepared in different ratios have nearly same optical properties when compared to PEDOT (Nearly all copolymers have the same absorbance max. around 618 nm and nearly same optical band gap value around 1.6 eV).

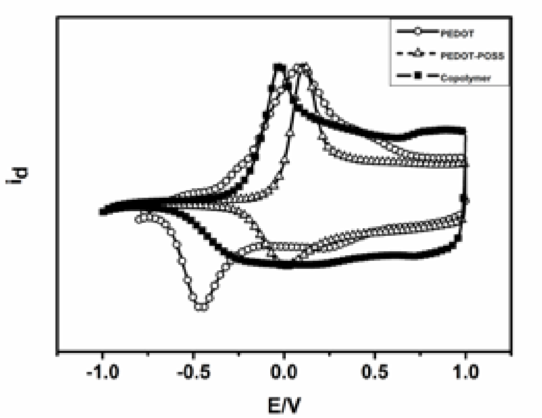

Figure 1: Electrochemical behavior of the films PEDOT, copolymer and PEDOT-POSS coated on Pt electrode in an electrolyte solution of 0.1M TBAH dissolved in ACN.

Acknowledgement: Autors acknowledge Atilim University for funding this project (ATÜ-BAP-A-1314-01) through Atilim Optoelectronic Materials and Solar Energy Laboratory (ATOMSEL).

Keywords: Copolymer, EDOT, Polyhedral Oligomeric Silsesquioxane, POSS, Electrochromism

P-153

GREEN APPROACH TO CORROSION INHIBITION OF MILD STEEL IN SULPHURIC ACID SOLUTION BY THE EXTRACT OF OLEA EUROPAEA L. LEAVES

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A large number of organic compounds are known as effective corrosion inhibitors for mild steel [1-3]. However, most of these compounds are expensive and easily lead to serious environmental problems. Therefore, there is a need to develop a new class of corrosion inhibitors being inexpensive and eco-friendly. The use of natural products, derived from extracts of leaves, as corrosion inhibitors has received strong preference due to their low cost, biodegradability and non-toxic nature. Many recent researches have been made on the inhibitive effect of some plant extracts [4-8].

The inhibitive action of the extracts of olive (*Olea europaea* L.) leaves against corrosion of mild steel in 1 M H_2SO_4 medium was investigated by using electrochemical techniques such as potentiodynamic polarization, linear polarization and electrochemical impedance spectroscopy (EIS). The effect of temperature, immersion time and acid concentration on the corrosion behaviour of mild steel in 1 M H_2SO_4 with addition of extracts of olive leaves (OLE) was studied. The adsorption isotherm for the adsorption onto the metal surface of the inhibitor was determined by utilizing the obtained data. Results obtained from several measurement techniques revealed that OLE could serve as an effective inhibitor towards the corrosion of mild steel 1 M H_2SO_4 medium.

Acknowledgements: The authors are greatly thankful to Mersin University research fund for financial support.

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Keywords: Mild steel, corrosion inhibitors, olea europaea L, electrochemical techniques

P-154

DETERMINATION OF PROPERTIES OF NOVEL AZOMETHINE COMPOUNDS AND METAL COMPLEXES IN LIQUID CRYSTALLINE MEDIA

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Liquid crystal (LC) systems, which exhibit a strong response to a external warning such as magnetic field, temperature, play an important role in numerous field including soft materials production, displays, temperature sensors, new chemosensitive collodial architectures [1]. Lyotropic liquid crystals (LLC), in which can be prepared in water with amphiphilic molecules that have a hydrophobic and a hydrophilic groups, observe in solution where the molecules organize into micelles base on concentration and temperature [2]. Due to great flexibility, diverse structural aspects, ability to form metal complexes, biological properties and synthesizable with high yield [3]. Schiff bases which are known azomethine compounds are attractive compounds. On the other hand metal containing liquid crystal systems have excellent properties of liquid crystal systems and transition metals. In this study metal complexes of novel Schiff base of octabenzone which is known ultraviolet absorbers were analyzed in lyotropic liquid crystals.

Schiff base of octabenzone was synthesized by condensation with ethylenediamine in tetrahydrofurane. Metal complexes of synthezised Schiff base were obtained with different metals (Co, Ni, Fe, Cu). Lyotropic liquid crystalline systems were prepared with decylammonium chloride (DACl)/ potassium chloride (KCl)/water (H_2O) /cholesterol (Cho).

Schiff base was characterised with FT-IR, UV-Vis. ^{13}C and ^{1}H NMR spectroscopy. Pitch of LLC and type of phases were determined Polarized Optical Microscope (POM). Before octabenzone and Schiff base were added, cholesteric phase was observed. After than cholesteric phase expanded lameller phase due to effect of added guest molecules.

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Keywords: Liquid crystal, Schiff base, Metal complexes

P-156

THERMAL CHARACTERIZATION OF BLENDS OF PS AND PP WITH POLY(SILYNE-CO-CARBYNE)

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Due to ceramics' physical and chemical properties, scientists are interested in using the material in a variety of devices and applications, ranging from electrical to biomedical applications [1-4]. Ceramics can be produced from some special polymers, suc as poly(hydridocarbyne) and poly(silyne-co-carbyne). These polymers are called as pre-ceramic polymers. Pre-ceramic polymers are an important class of polymers which can be converted to ceramic materials upon heating. These types of polymers can form tough, hard-wearing ceramic materials with high thermal stabilities. Polycarbynes and polysilynes are examples of such polymers that form diamond, diamond-like carbon [1] and silicon carbide [2-4] upon pyrolysis. Polycarbynes [1] are polymeric precursors to diamond and diamond-like carbon. Polycarbynes and polysilynes are simply produced via electropolymerization. The method simply requires trihalo organo compounds for polycarbynes and trihalo silane compounds for polysilynes as monomer, electricity, a solvent and an electrolyte [2,4]. In this study, poly(silyne-co-carbyne)(PSC) was synthesized electrochemically and characterized via ^{1}H-NMR, ^{13}C-NMR, FTIR and GPC. Then the blends of PSC were prepared with PS and PP at melting temperature of them. All blends were characterized via DSC, TGA, mass spectrometry and LOI .

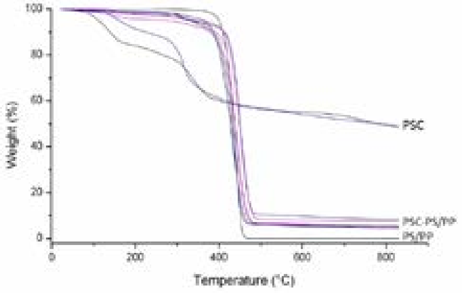

Figure 1: TGA of PSC and its blends withPS/PP.

Acknowledgements: This project was financially supported by **TUBİTAK** with **211T108** project number.

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Keywords: Electropolymerization, Pre-ceramic polymers, Siliconcarbide, Silicondioxide

P-157

KINETIC STUDY OF DYE ADSORPTION ON GRAPHENE OXIDE-CHITOSAN COMPOSITE FILMS

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Chitin is a natural polysaccharide that composed of N-acetylglucosamine units. Chitosan is obtained by partial deacetylation of chitin in basic media. Chitosan has no toxic property against live biological systems and environment. This cationic biopolymer is also biocompatible and biodegradable. In this study, chitosan films were used as an adsorbent to remove anionic fluorescent dye pyranine from its aqueous solution. Graphene oxide (GO) which is oxidized form of two dimensional graphene, is very popular material. Studies in recent years showed that it can change electrical, mechanical, thermal characteristics of many biopolymeric systems. In order to prepare chitosan-graphene oxide composite films, 1% (w/v) chitosan was dissolved in 1% (v/v) acetic acid solution. Graphene oxide was added to chitosan solution, so that the concentration of GO was ranging between 40 and 120 µg/mL in final solution. This polymer solution was casted into petri dishes and dried in a laboratory refrigerator. Sodium sulfate solution (1 % w/v) was used for ionic crosslinking agent of composite films. Chitosan-graphene oxide films were dipped into aqueous solution of pyranine dye and adsorption of pyranine to films was followed by fluorescence spectroscopy. All experimental results were used for kinetic modelling of adsorption.

Keywords: chitosan, graphene oxide, adsorption, ionic crosslinking

P-158

DETERMINATION OF THE EFFECT OF ALKALI SULFATES ON SOME MICELLIZATION PARAMETERS OF KOSMOTROPE AND CHAOTROPE SURFACTANT MOLECULES

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Micellization is an important phenomenon for some industrial applications, such as detergent production, improving some technological aspects of cosmetics and crude oil recovery, and for biological membranes [1,2]. Micelles are agglomeration of surfactant molecules in a suitable solvent (in our case, water). In other words, surfactant molecules form micelles above a certain concentration, so-called critical micelle concentration (cmc). The cmc of the surfactants can be found from electrical conductivity [3], surface tension [4], density [5], fluroscence [6] measurements.

An important point for micellar solutions is to determine the factors that affect the micellization, i.e. cmc of the surfactants. Experimental studies [2] indicated that cmc in aqueous solutions depends on (a) the structure of the surfactant, (b) the presense of electrolyte, (c) temperature and (d) the second liquid phase. Among these factor, the presence of the strong electrolytes in the solution is a subject of this study.

In the framework of the present study, we investigate the effect of alkali sulfate salts on some micellization parameters (cmc, micellization Gibbs energy, $\Delta_{mic}G$, and degree of counterion binding, β) of a kosmotrope surfactant (potassium laurate, KL) and a chaotrope one (sodium dodecylsulfate, SDS). Electrical conductivity measurements, Figure 1, were applied to three surfactant/water binary mixtures and also to the ternary mixtures obtained by the addition of alkali sulfates to the binary mixtures. The measurements were performed at constant electrolyte concentrations and temperature (40.0°C).

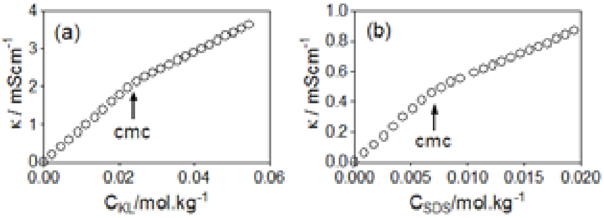

Figure 1: (a) Specific conductivity versus total surfactant concentration for the binary mixtures of (a) KL/H_2O and (b) SDS/H_2O.

Acknowledgements: We would like to thank Abant Izzet Baysal University Directorate of Research Projects Commission (Grant number 2016.03.03.986) for supporting this work.

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Keywords: kosmotrope and chaotrope surfactant, micellization, thermodynamic parameters, electrical conductivity

P-159

EFFECT OF HOFFMEISTER ANIONS ON MICELLIZATION AND LYOTROPIC LIQUID CRYSTALLINE PROPERTIES OF TDTMABr SURFACTANT MOLECULE

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Micellar systems, isotropic micellar solutions and lyotropic liquid crystals, are important from both scientific and industrial points of view. Since micellar solutions are used in cosmetics, detergency etc., lyotropics are related to biological systems such as biological membranes [1,2]. From some respects, isotropic micellar solutions may be assumed to be precursors of lyotropic liquid crystalline structures. In both micellar systems, some factors affect the micellization of surfactant molecules and scientists have been investigating these factors to describe new micellar systems in the literature .

In the framework of the present study, we investigate the effect of some Hofmeister anions on both some micellization parameters (cmc, micellization Gibbs energy, $\Delta_{mic}G$, and degree of counterion binding, β) and lyotropic uniaxial-to-biaxial nematic phase transitions of a cationic chaotrope surfactant (tetradecyltrimethylammonium bromide, TDTMABr). Electrical conductivity measurements, Figure 1, and laser conoscopy, Figure 2, were applied to the isotropic micellar solutions and lyotropic liquid crystalline mixtures, respectively. The results indicated that Hofmeister anions exhibit significant effects not only on micellization of the surfactant but also on lyotropic uniaxial-to-biaxial nematic phase transitions.

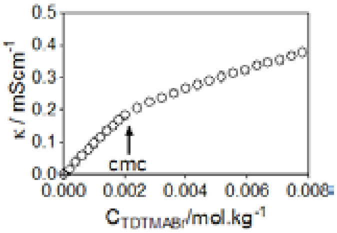

Figure 1: Specific conductivity versus total surfactant concentration for the binary mixture of $TDTMABr/H_2O$.

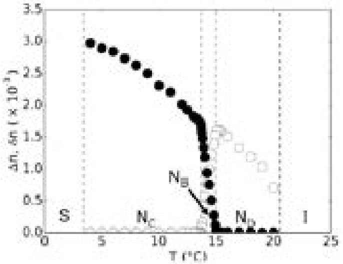

Figure 2: Birefringences, Δn (●) and δn (○) obtained from laser conoscopy to determine the uniaxial-to-biaxial nematic phase transitions in the lyotropic mixture of TDTMABr/NaBr/DeOH/water. S:solid phase (freezing), I: isotropic phase, N_D: uniaxial discotic nematic phase, N_B: biaxial nematic phase, N_C: uniaxial calamitic nematic phase.

Acknowledgements: We would like to thank Abant Izzet Baysal University Directorate of Research Projects Commission (Grant number 2016.03.03.1012) for supporting this work.

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Keywords: Hoffmeister Anions,Laser Conoscopy,Lyotropic, Micellization

P-160

ROLE OF GUEST MOLECULES WITH ALIPHATIC AND AROMATIC HYDROPHOBIC PARTS ON THE FORMATION OF DIFFERENT LYOTROPIC NEMATIC PHASES

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Lyotropic liquid crystals (LLCs) are in close contact with industrial [1] (detergent production, oil recovery, cosmetic, food, soaps, etc.) and also with technological [2,3] (templates for the preparation of mesoporous materials, bio-active materials, thermally, electrically or magnetically controllable optical devices, etc) applications. Among the LLCs structures, nematic phases have been still attracting the attentions of several research groups, since the discovery of first lyotropic nematic phases in 1967-68 [4,5]. In the literature, three nematic phases were identified in the literature. Two of these nematic phases align with their directors either parallel (uniaxial calamitic nematic phase, N_C) or perpendicular (uniaxial discotic nematic phase, N_D) to the magnetic field direction. The third nematic phase is biaxial, N_B. In contrast to uniaxial ones, biaxial nematic phase has two different optical axes. The N_B is mainly found in lyotropic phase diagrams between the N_D and uniaxial N_C phases [6,7]. It was experiementally proved [8] that the uniaxial to biaxial phase transitions are of second order as described by a mean-field Landau-type theory [9,10].

In the framework of the present study, we investigate the stabilization of the different nematic phases in lyotropic mixtures doped with guest molecules having aliphatic and aromatic hydrophobic parts. The lyotropic host mixture of potassium laurate/decanol/water presenting only the uniaxial nematic calamitic phase was doped with guest molecules with phenyl-rings (toluene, benzyl alcohol and benzoic acid) and with aliphatic alkyl chains (dodecane, dodecanol and dodecanoic acid), separately. The nematic phase sequences, in particular the presence of the biaxial nematic phase, were investigated as a function of the different guest molecule localization in the micelle and temperature. The laser conoscopy was used to characterize the different nematic phases. Since the guest molecule benzoic acid was shown to be very effective in stabilizing the three nematic phases (two uniaxial and a biaxial), but all others not. The experimental results are interpreted considering the screening effect of the hydrophilic parts of the dopants on the repulsion between the polar heads of the main amphiphilic molecules at micelle surfaces and intrinsically biaxial micelle model, Figure 1.

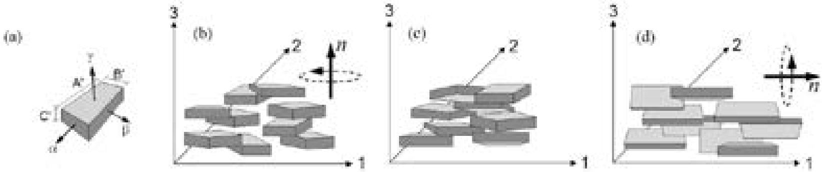

Figure 1: (a) Sketch of the orthorhombic micelle in the framework of the IBM model. The detergent amphiphilic bilayer is represented by C'.

Acknowledgements: We would like to thank Abant Izzet Baysal University Directorate of Research Projects Commission (Grant number 2016.03.03.988) for supporting this work.

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Keywords: lyotropic liquid crystals, phase transitions, nematic phases,laser conoscopy,birefrienges

P-161

A NOVEL ORANGE EMITTING PHOSPHOR: $Ba_3B_2O_6$:Sm^{3+}

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Boron is always combined with oxygen to form borates. Borates are one of the most interesting groups due to the ample diversity of their crystal chemistry. New borate compounds which are not attainable with any other compounds are discovered [1]. Borate compounds are the most promising materials not only for scientific area but also for commercial utilization. They have unique combination of large electronic band gaps, strong non-linear optical properties due to their lattice, chemical and environmental stability and mechanical robustness [2]. Therefore borates have considerable importance for production of high technology materials. Borates have unique crystal and electronic structures, so they have found widespread application in areas like materials processing, medicine, etc., and they are used as a host of laser materials, nonlinear optical materials and luminescent materials.

The $Ba_3B_2O_{6:}$ Sm^{3+} phosphors were synthesized by the general solid-state reaction method and their luminescence properties were investigated using $BaCO_3$ (98%), Sm_2O_3 (99,9%), H_3BO_3 (A.R.), as the raw materials, general solid-state reaction was employed to synthesize the ultra-fine phosphors. $Ba_3B_2O_{6:}$ 1%, 5%, 10% Sm^{3+} via grinding in agate mortar and subsequently heated at 1000 °C for 6 hours. The phase identification of the samples were carried out by X-Ray powder diffractions (XRD). The optimization of reaction conditions were carried out by differential thermal analysis methods (TG/DTA). The excitation and emission spectra were recorded by photoluminescence spectrophotometer (PL).

Acknowledgement: We acknowledge the financial support granted by Erciyes University ERUBAP FDK-4432

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Keywords: Luminescence, phosphor, Ba3B2O6:Sm3+

P-162

RESEARCH OF THE ESTERIFICATION REACTION OF ANHYDRIDES OF ALKENYLSUCCINIC ACIDS IN THE PRESENCE OF VARIOUS CATALYSTS

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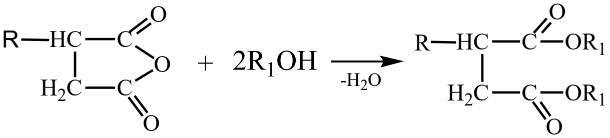
Esters of carboxylic acids found wide application in various industries as lubricants, additives for lubricating oils and fuels, solvents, components of various aromatic essences, food additives, perfumery compositions, reagents for treating textiles and paper [1].

It is known that the most basic and simple method of producing esters is currently the esterification of carboxylic acids in the presence of acid-type catalysts (for example, p-toluenesulfonic acid (PTSA), sulfuric acid, etc.).

We synthesized the esters of vicinal dicarboxylic acids, in particular esters of alkenylsuccinic acid with alcohols of various structures [2]. As the catalyst of an esterification used acidic catalysts (PTSA and Tseokar-2, TiO_2, KU-2, N-methyl pyrollidone hydrosulphate, 1,4-dimethylpipeazine dihydrosulphate).



The efficiency of the catalyst was evaluated by the yield of the ester. The amount of catalyst ranged from 0.5-1.5% on the reaction mixture. The molar ratio of alcohol to anhydride in the preparation of esters was 1: 2-3.Esterification of anhydride with low-molecular alcohols (C_2-C_6) was carried out in the presence of azeotropic solvents, such as benzene, toluene, p-xylene at the boiling temperature of these solvents. Completion of the reaction was determined by quantity of allocated reaction water, also by value of acid number of an esterificate. The duration of the esterification reaction was typically 6-8 h. In reaction course an important role is played by chemical structure of alcohol.

For studying the influence of alcohol structure on course of esterification reaction it was investigated reaction of an esterification of anhydride AAA with alcohols of aliphatic, cyclic and aromatic series. Esterification by cyclic alcohols (cyclohexanol, methyl-cyclohexanol, benzyl alcohol) proceeds more difficulty [3], which prolongs the reaction time. The yield of cyclic ethers is less than the yield of esters with aliphatic alcohol.

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Keywords: alkenylsuccinic acid, acid-type catalysts, vicinal dicarboxylic acids

P-163

ONE-POT REDUCTIVE AMINATION OF NITROARENES USING MESOPOROUS GRAPHITIC CARBON NITRIDE SUPPORTED SILVER-PALLADIUM ALLOY NANOPARTICLES AS CATALYSTS

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Amines are widely used in the dye industry, the biomedical field, the textile products, and pharmaceutical chemistry [1]. Therefore, the synthesis of amines by an efficient method under the mild conditions is a very important topic today. [2-4]. The reduction of nitro, nitrile, and amide functional groups, nucleophilic substitution reactions and Hoffmann-Curtius rearrangement are the general methods for the synthesis of amines. The one-pot reductive amination reaction converting carbonyl compounds to the corresponding alkylamine derivatives is considered to be another effective method for the synthesis of amines [5]. However, it can be realized by the examination of the existing reductive amination reactions that they either include several difficult reaction conditions (high temperature, pressure, etc.) and/or have multi-step synthesis. In this regard, one-pot synthesis of alkylamine derivatives using commercially available raw materials under mild conditions is important and necessary for the green chemistry concept.

In this study, we report a novel and facile one-pot protocol for the synthesis of alkylamines derivatives via a reductive amination of nitroarenes under mild conditions, comprising the mesoporous graphitic carbon nitrite (mpg-C_3N_4) supported AgPd alloy nanoparticles as catalysts and formic acid as a hydrogen source. 2.2 nm AgPd alloy nanoparticles were synthesized by thermal decomposition and co-reduction of silver(I) acetate and palladium(II) acetylacetonate in a mixture of oleylamine, oleic acid and 1-octadecene. By using the current recipe, four different compositions of AgPd alloy nanoparticles ($Ag_{42}Pd_{58}$, $Ag_{60}Pd_{40}$, $Ag_{25}Pd_{75}$ and $Ag_{52}Pd_{48}$) has been successfully synthesized by only tuning the metal salts ratios and the were assembled on mpg-C_3N_4 with liquid self-assembly method. Besides mpg-C_3N_4, the $Ag_{42}Pd_{58}$ NPs were also assembled on reduced graphene oxide and Ketjen Black. mpg-C_3N_4@$Ag_{42}Pd_{58}$ catalyst provided the highest conversion yield in the reductive amination of nitrobenzenes to respective alkyl amines. Finally, the presented catalytic reductive amination protocol was applied to 10 different aromatic nitro compounds and all of them was successfully converted to related alkylamine derivatives.

Keywords: Reductive amination, One-pot synthesis, bimetallic nanoparticles, alloy nanoparticles, transfer hydrogenation, alkylamines.

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Keywords: alloy nanoparticles, alkylamines, bimetalic nanoparticles,transfer hydrogenation, One-pot synthesis, Reductive amination

P-164

INVESTIGATION OF [4+2] CYCLOADDITION REACTIONS IN VARIOUS CONDITIONS

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Diels-Alder reactions are very significant for synthetic organic chemsitry and mechanistic works due to easily obtaining cyclic composition with six carbon. Generarly we obtain endo product with Diels Alder reactions because this reactions is kinetically controlled. Hetero cyclic and tetracyclic molecules which obtaining via using Diels-Alder reactions are very important in the organic chemistry and they are used as starting material which are process in the pharmacology and other fields [1-3].

Subcritical water which is one of the foremost environmentally friendly solvents, has been used as a solvent in organic synthesis reactions in recent years [4].

The aim of our study was investigated to [4+2] cycloaddition reaction between 7-oxabicyclo[2.2.1]hepta-2,5-diene-2,3-dicarboxylate **(3)** and 1,3-cyclohexadiene **(4)** using different catalysts (phenol, acetic acid, nafion, β-cyclodextrin, and $FeCl_3$) at room temperature, and also without catalyst at 25 and 40 °C. In addition, We decided to investigate effect of subcritical water. This reaction is so important due to green chemistry properties.

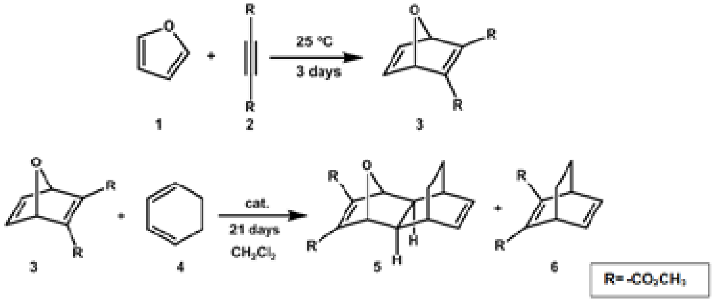

Figure 1: Synhesis of newly tetracyclic molecule via Diels-Alder reactions

In a preliminary study, dimethyl 7-oxa-bicyclo[2.2.1]hepta-2,5-diene-2,3-dicarboxylate (3) [5] was prepared by the cycloaddition reaction of dimethyl acetylene dicarboxylate (2) to furan (1) in high yield. Then, the reaction between 1,3-cyclohexadiene and dimethyl 7-oxabicyclo[2.2.1]hepta-2,5-diene-2,3-dicarboxylate is investigated both without catalyst and different catalysts for 21 days. In addition, the reactions is investigated with subcritical water. In the end of the reactions, different products (tetracyclicmolecule products **5** and *retro*-Diels Alder **6**) were obtained with different yield. All structures of these products were characterized by ^{1}H-NMR, ^{13}C-NMR, MS and IR spectroscopy. When we looked the molecules structures, contrary to the general, we obtained *exo* product.

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Keywords: Diels-Alder reactions, subcritical water, catalyst

P-165

CERIA-SUPPORTED RUTHENIUM NANOPARTICLES AS HİGHLY ACTIVE AND LONG LIVED CATALYST IN HYDROGEN GENERATION FROM THE HYDROLYSIS OF AMMONIA BORANE

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Hydrogen has been considered as the clean, nontoxic, and abundant energy carrier in transition from fossil fuels to the renewable energy sources on the way towards a sustainable energy future [1,2]. However, safe and efficient storage of hydrogen is still the main obstacle in the widespread application of hydrogen energy[3]. Among the chemical hydrides tested as hydrogen storage materials for onboard applications [4], because of high gravimetric and volumetric hydrogen storage capacity [5], ammonia borane (NH_3-BH_3, AB) appears to be the most promising candidate for chemical hydrogen storage due to its 19.6% wt hydrogen content, high stability, and environmental benignity [6]. Hydrolysis in aqueous medium is the widely accepted and well-studied way of hydrogen release from ammonia borane because of favorable kinetics and mild reaction conditions [7].

Ruthenium(0) nanoparticles supported on ceria (Ru^0/CeO_2) were in situ generated from the reduction of ruthenium(III) ions impregnated on ceria during the hydrolysis of ammonia borane. Ru^0/CeO_2 were isolated from the reaction solution by centrifugation and characterized by ICP-OES, BET, XRD, TEM, SEM-EDS and XPS techniques. All the results reveal that ruthenium(0) nanoparticles were successfully supported on ceria and the resulting Ru^0/CeO_2 are highly active, reusable and long-lived catalysts in hydrogen generation from the hydrolysis of ammonia borane with a turnover frequency value of 361 min^{-1}. The reusability tests reveal that Ru^0/CeO_2 are still active in the subsequent runs of hydrolysis of ammonia borane preserving 60% of the initial catalytic activity even after the fifth run. Ru^0/CeO_2 provide unprecedented catalytic life time (TTO = 135,100) in hydrogen generation from the hydrolysis of ammonia borane at 25.0 ± 0.1°C before deactivation. The work reported here also includes the formation kinetics of ruthenium(0) nanoparticles. The rate constants for the slow nucleation and autocatalytic surface growth of ruthenium(0) nanoparticles were obtained by using the . The evaluation of rate constants at various temperatures provides the estimation of activation energies for both reactions, $E_a = 60 \pm 7$ kJ/mol for the nucleation and $E_a = 47 \pm 2$ kJ/mol for the autocatalytic surface growth of ruthenium(0) nanoparticles, as well as the activation energy of $E_a = 51 \pm 2$ kJ/mol for the catalytic hydrolysis of ammonia borane.

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Keywords: catalyst, ceria, nanocluster, hydrogen

P-166

SYNTHESIS OF TETRAZOYL-PYRIDINE BASED RUTHENIUM(II) COMPLEXES AND STUDY ON CATALYTIC WATER SPLITTING

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Catalytic Water Splitting is a general term for a chemical reaction which the water molecules are converted to hydrogen and oxygen using by catalized. Producing to hydrogen efficiently and economicaly would be a key of handling hydrogen based energy technology [1].

There are several reasons to use metal based catalyst for decomposition of water instead of using thermal or electrochemical methods. The most important reason is highest turn-over numbers (TONs) on catalytic water oxidation (WOX) systems [2,3].

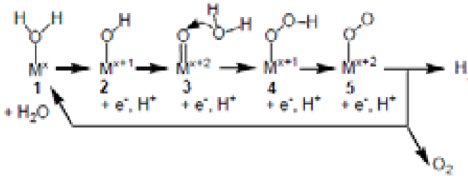

Figure 1: Mechanism of Catalytic Water Splitting

In this study, all ligands are synthesized, purificated, analyzed and studied as tested by cyclic voltammetry on their catalytic activities on water oxidation.

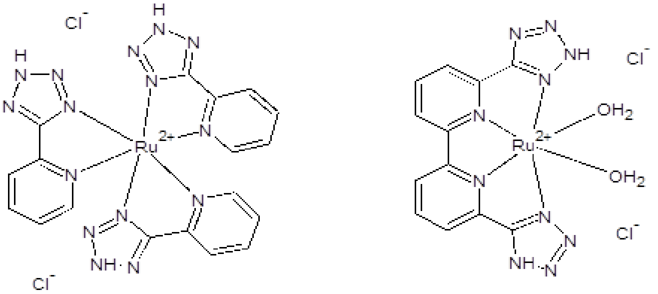

Figure 2: Tetrazole ligands

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Keywords: Ruthenium, Tetrazole, Hydrogen, Water, Splitting

P-167

PYROLYSIS OF ISOCHRYSIS MICROALGAE WITH METAL OXIDE CATALYSTS FOR BIO-FUEL PRODUCTION

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Petroleum and crude oil prices have been highly volatile as a result of increasing energy demand in recent years. Researches on alternative and renewable fuels have been intensified to meet the increasing demand and to stabilize the energy prices. Biomass is considered to be one of the most promising candidates due to its renewability, carbon neutrality and high productivity [1]. However, biomass as a feedstock for bio-fuel production should be cheap, fast growing, abundant, not compete with food industry, easily available and with minimum by products and waste [2]. Algae, one of the fast growing microorganisms found in water are considered as potential feedstock for bio-fuel production. Algae has already attacted great attention in recent years [3,4]. Various processes have been used for the production of bio-fuels from algal biomass including solvent extraction for bio-diesel, supercritical water gasification, anaerobic digestion for bio-gas and pyrolysis for bio-oil. Algae are promising feedstocks for the following reasons: (i) high growth rate (up to 20 g dry algae per m^2 perday), (ii) high yield per area, (iii) high efficiency in CO_2 capture and solar energy conversion, (iv) no competition with agricultural food. Algae can grow in open water such as sea water and ponds or in photobioreactors on non-arable lands. However, few algae species are cultivated on an industrial scale [5]. Algae contain three main components: proteins, carbohydrates and lipids. Some microalgae species contain high lipid content (up to 80% bimoass) and are good feedstocks for biodiesel production (Chisti, 2008). From an economic point of view, biofuel production from microalgae requires utilization of the complete biomass as efficiently as possible. Algae processsing solid residue contains minerals up to 10% which can be fed back to the growth cycle as a soil amendment product [6]. However, the rest 60% of microalgae is considered as waste which makes the process economically not attractive. To develop economically feasible processes for microalgae biofuels, whole components need to be utilized completely based on the microalgae biorefinery concept. Thermochemical processes can utilize complete organic content of algal biomass for biofuel production.

In this study, pyrolysis of *Isochrysis* microalgae was performed in a fixed-bed reactor without and with metal oxide catalysts (CeO_2, TiO_2, Al_2O_3) at the temperatures of 450, 500 and 550 °C with a constant heating rate of 40 °C/min. The effects of pyrolysis parameters such as temperature and catalyst on product yields were investigated. The amounts of bio-char, bio-oil and gas products were calculated. The composition of the produced bio-oils was determined by Elemental analysis (EA), Fourier transform infrared spectroscopy (FT-IR), proton nuclear magnetic resonance (^1H NMR) and Gas chromatography/mass spectrometry (GC–MS) techniques. The results showed that both temperature and catalyst had significant effects on conversion of *Isochrysis* into solid, liquid and gas products. The highest bio-oil yield (24.30 %) including aqueous phase was obtained in the presence of TiO_2 (50%) as catalyst at 500 °C. 98 different compounds were identified by GC-MS in bio-oils obtained at 500 °C. EA analysis showed that the bio-oils contained ~66-69 % C and having 31-34 MJ/kg higher heating values.

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Keywords: Energy, Microalgae, Pyrolysis, Isochrysis, Catalyst

P-168

ELECTROCHEMICAL DETERMINATION OF BENZO[K]FLUORANTHENE BY SQUARE WAVE VOLTAMMETRY ON A GLASSY CARBON ELECTRODE

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Polycyclic aromatic hydrocarbons (PAHs) are a large group of organic compounds with two or more fused aromatic rings. They are widespread environmental contaminants resulting from incomplete combustion of organic materials during both natural events and human activities, such as forest fires and volcanic eruptions, and burning of fossil fuels and petroleum products during industrial production, food processing, of machinery operation, including automobiles, airplanes and ships. Certain PAH species, such as benzo[k]fluoranthene (B[k]F), are known to be carcinogenic to animals and humans [1]. In the PAH species, such as 7,12-Dimethylbenz[a]anthracene and benzo[a]pyrene have been studied by electrochemical methods using pencil graphite, boron doped diamond and glassy carbon electrodes [2,3]. The electrochemical oxidation of B[k]F was investigated in buffered aqueous media over the pH range of 1.0-10.0 using glassy carbon (GC) electrode. Square-wave stripping voltammograms at different concentrations of B[k]F were recorded under the maximum current experimental conditions. The use of B[k]F oxidation at about +0.78 V as the analytical peak allowed quantification in the range of 20 μM to 160 μM (Figure 1).

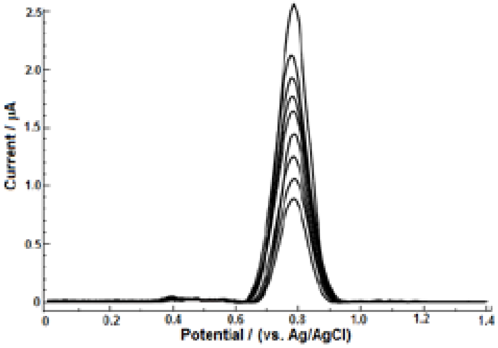

Figure 1. Square-wave voltammograms for B[k]F in Britton-Robinson buffer, pH 3.0

Acknowledgements: This research was funded by the Scientific Research Projects Presidency of Yüzüncü Yıl University (2010-FBE-YL127).

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Keywords: Benzo[k]fluoranthene, glassy carbon Electrode, Square Wave Voltammetry

P-169

INVESTIGATION OF CORROSION BEHAVIOR OF PANI/ZNO NANOCOMPOSITE COATED STEEL

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At the last years, conductive polymers such as polyaniline,polypyrolle, polyindole .. have been widely studied due to their electrical, optical, mecanical properties, and easy preparation by many researchers [1-2]. Conductive polymers are used in many area such as batteries ,sensors, electronic devices and corrosion protection in organic coating[3].Among the family of conducting polymers, polyaniline is a p-type semiconductor that can be synthesised by electrochemical and chemical methods. To improve the electrical and mechanical properties of polyaniline,inorganic nano metal oxide particles doping studies has become more important[4]. The addition of inorganic nanoparticles in the polymer matrix shows high performance in polymer applications. Various methods have been widely used for the synthesis of the nanocomposites of PANI with the inorganic nanoparticles such as TiO_2, ZnO, CdS…[5]. In the present work, Polyaniline-ZnO (0.1g, 0.3 g and 0.5 g) nanocomposite coatings on steel have been investigated by using the galvanostatic method. The electrosynthesized coatings were characterized by FT-IR spectroscopy, XRD and SEM. The corrosion protection performance of PANI-ZnO nanocomposite coatings was investigated in the %3 NaCl solution by using potantiodynamic polarization technicque and electrochemical impedance spectroscopy. The results showed that amount of nano ZnO in polymer matrix increases, the corrosion rate of steel decreases (Fig.1).

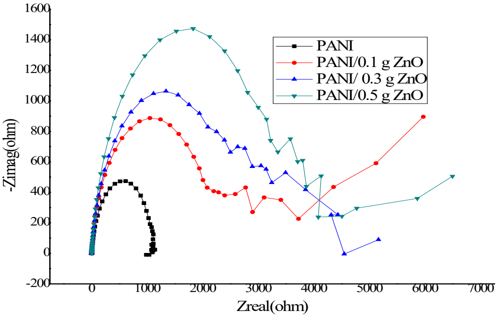

Figure 1. Nyquist impedance plots for PANI and PANI/ZnO nanocomposite coated steel

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Keywords: Corrosion, Polianiline, Nanocomposite

P-170

CORROSION BEHAVIOUR OF POLY(N-ETHYLANILINE) FILM ON ZINC-NICKEL PLATED CARBON STEEL

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In the last two decades, the development of conducting polymers as coating materials for corrosion protection of metals/alloys has become a significant new research field. Among widely used conducting polymers for this purpose are polyaniline (PANI) and its derivatives as well as polypyrrole [1-3].

In this work, zinc-nickel alloy plating (ZnNi) was successfully deposited on carbon steel (CS) with galvanostatic technique. Homogenous zinc-nickel plating were produced from electrolyte solution of pH=5,5. Poly(N-ethylaniline) film have been synthesized by oxidation of N-ethylaniline using cyclic voltammetry technique on zinc-nickel plated carbon steel (CS/ZnNi) electrode. Homogenous and adherent Poly(N-ethylaniline) film were produced from 0.02 M N-ethylaniline containing 0.20 M sodium oxalate solution. The characterization of zinc-nickel deposited carbon steel electrodes with and without poly(N-ethylaniline) film have been investigated by using AC impedance spectroscopy (EIS) technique, linear sweep voltametry (LCV) technique, anodic polarization curves, corrosion potential-time (Ecor-t) curves and scanning electron microscopy (SEM). The results showed that polymer film exhibited significant barrier property against the attack of corrosive agents.

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Keywords: Corrosion, Poly(N-ethylaniline), EIS

P-171

THEORETICAL STUDY OF A NEW GROUP ISATIN DERIVATIVES OF CORROSION INHIBITORS

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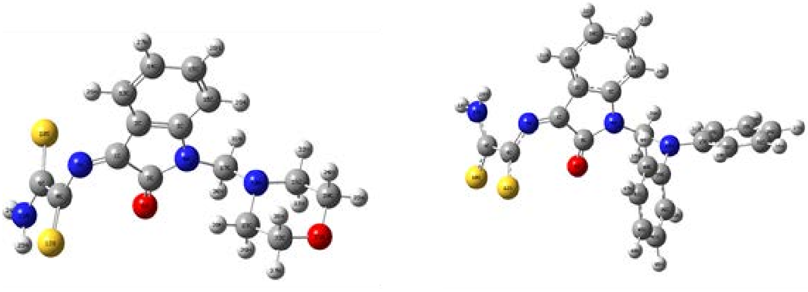
1-morpholinomethyl-3-(1-N-dithiooxamide)iminoisatin [MMTOI] and 1-diphenylamino methyl-3-(1-N-dithiooxamide)iminoisatin [PAMTOI] derivatives (Figure 1) that have been proven to act as corrosion inhibitor of N80 steel in HCl solution are investigated. Quantum chemical approach at B3LYP/6-311G(d,p) level of theory in gas and water phases has been used to calculate some structural and electronic properties such as E_{HOMO}, E_{LUMO}, the energy band gap $\Delta E_{HOMO-LUMO}$, dipole moment (μ_D), total energy (TE) and other related parameters [ionization potential (I), electron affinity (A), electronegativity (χ), chemical potential (μ_C), global chemical hardness (η), softness (σ) and number of transferred electrons (ΔN)] of the isatin derivatives. The theoretical results are in agreement with the experimental data.



(a) (b)

Figure 1: The optimized structures obtained using B3LYP/6-311(d,p) level of (a) MMTOI and (b) PAMTOI

Keywords: Corrosion, isatin, DFT

P-172

SYNTHESIS AND EXAMINATION OF THE ELECTROCHEMICAL PROPERTY OF Pd-METAL PHOSPHINE COMPLEX

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Metal complexes are studied extensively in recent years due to its wide application areas such as smart materials, optical devices in production of new materials[1]. Terefore in this study, Pd(II) metal complex of bis(diphenylphosphinemethyl)amino ligands, $((Ph_2PCH_2)_2N(CH_2)_3(CH_3)_3)$, has been synthesized using Schlenk method under nitrogen atmosphere[2]. It has been characterized by FT-IR, X-Ray, NMR (^1H, ^{13}C, ^{31}P) spectroscopic and elemental analysis techniques. Electrochemical behaviour of complex has been investigated by cyclic voltammetry. The oxidation and reduction potentials of palladium complex was determined utilizing three electrodes configuration at 25°C in $1x10^{-3}$M $[PdCl_2(Ph_2PCH_2)_2N(-CH_2)_3CH_3]$ at glassy carbon electrode in 0.1 M dichloromethane with solution TBAP as a supporting electrolyte at 100 mV/s scan rate. As seen in figure 1.a) The complexes of π-acceptor ligands such as phosphines may undergo two-electron reduction with the stabilization of Pd^0.

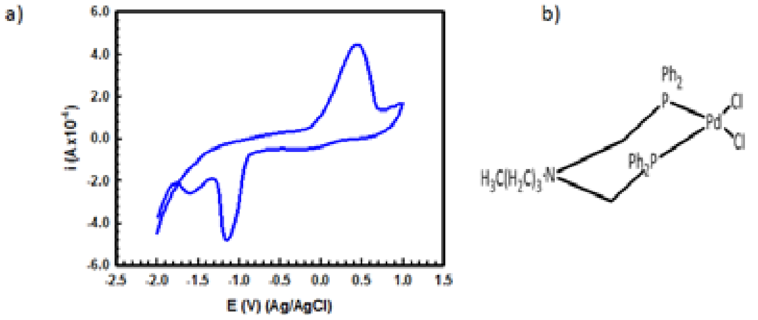

Figure 1.a) *Cyclic voltammetry behavior of $1x10^{-3}$M $[PdCl_2(Ph_2PCH_2)_2N(CH_2)_3CH_3]$ at glassy carbon electrode in 0.1 M dichloromethane with solution TBAP as a supporting electrolyte at 100 mV/s scan rate.* ***b)*** *Structure of $[PdCl_2(Ph_2PCH_2)_2N(CH_2)_3CH_3]$.*

Acknowledgements: The authors are greatly thankful to Unit of Scientific Research Project(BAP) for financial support (Project Number : FDK-2014-3517)

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Keywords: Aminomethyldiphosphine, electrochemical property, Synthesis

P-173

A HIGHLY SENSITIVE NOVEL ELECTROCHEMICAL SENSOR FOR STUDIES OF THE INTERACTIONS OF METHYL PARABEN WITH DNA

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Parabens (PB) can be found in pharmaceuticals and personal care products such as shampoos, moisturizers, spray tanning solutions, shaving gels, makeups, and toothpastes etc. Experimental results show that parabens are not only adsorbed on the surface applied but are also identified in skin tissue, blood and urine. Parabens can also mimic hormone estrogen in the body [1]. For instance, the concentration of parabens in breast cancer tumours was found to be 20 ng per tissue. Parabens were detected in 18 out of 20 different tumors in a study conducted at the University of Edinburgh. However, no direct evidence of a causal link between parabens and cancer has been detected despite such outstanding reports and data. However, some chemicals are known to have high mutation effects in the DNA double helix. In this study, a novel electrochemical sensor based on carbon nanofibers and metal nanoparticles, was applied for the possible DNA-paraben interactions in solution phase to investigate the casual link between parabens and cancer. Fig.1. shows the square wave voltammograms (SWVs) of a constant concentration of Methyl Paraben (MPB) in the presence of varying concentration of DNA using the proposed electrode system. The free MPB exhibits one oxidation peak at ≈Epa=0.810 V in 0.1 M pH 7.0 PBS. The current drops on the addition of DNA owing to the binding of MPB. Furthermore the peak potential shifted to a more positive value in the presence of DNA. The shift in peak potential is characteristic of the intercalation of species into DNA [2]. In this case the binding constant of the MPB-DNA interaction was obtained as $K=1.54\pm(0.25)\times10^{+4}$

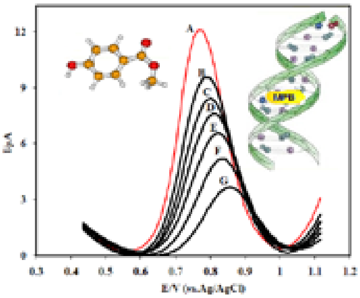

*Figure 1***.** SWVs of MPB in the absence of DNA (A) and presence of increasing concentrations of DNA (B-G) in 0.1 M pH 7.0 PBS.

Acknowledgements: The financial support from the Scientific and Technological Research Council of Turkey for a grant is appreciated (project no: 214Z268)

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Keywords: parabens, DNA, voltammetry, electroanalysis

P-175

VOC SORPTION PROCESSES ON FLUORO ALKYL, TOSYL AMIDO AND BRANCHED ALKOXY SIDE CHAINS CONTAINING PHTHALOCYANINE DERIVATES AND THEIR APPLICATION IN MASS SENSITIVE QCM SENSORS

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Phthalocyanines and their derivatives are a group of molecules, which have been studied for a very long time. At the beginning they were used as pigments and dyes, afterwards, they passed a renaissance and have been used in the field of photovoltaic, electrochromism, optical data storage, chemical sensors, catalysis and photodynamic therapy etc. [1]. Phthalocyanine molecules are very stable molecules due to their aromatic and symmetric structure. Because of their stability, phthalocyanine molecules are commonly used as sensitive layers for gas sensors based on different detection principles like QCM (Quartz Crystal Microbalance) or SAW (Surface Acoustic Wave) as well as conductive or capacitive sensors. In this work, 2,3,9,10,16,17,23,24-Octakis-(7,11-dioxaheptadecane-9-oxo) phthalocyanine, 2,3,9,10,16,17,23,24-octakis(2,2,3,3-tetrafluoropropoxy) phthalocyanine, octa tosylamido substituted metal free phthalocyanine and their Ni and Co derivatives were synthesized, characterized, and systematically investigated in their gas sorption and sensing properties using four different volatile organic compounds. The sorption mechanism and the interaction processes during sorption are followed using multi reflection Attenuated Total Reflection FTIR spectroscopy and the quartz crystal microbalance to determine the active species on the Pc surface and clarify the interaction mechanism. The results show that while Pcs with electronegative substituents are more sensitive to polar molecules due to π-π and π-H inter-actions that branched alkoxy substituted Pcs as presented here have an unexpected sensitivity to non-polar hydrocarbons due to dominant Van der Waals interactions between the long alkyl moiety of the substituent and the analyte (Figure 1) [2-4]. These are important results for the design of new sensitive molecules in order to improve sensor performance, e.g., in terms of selectivity and sensitivity.

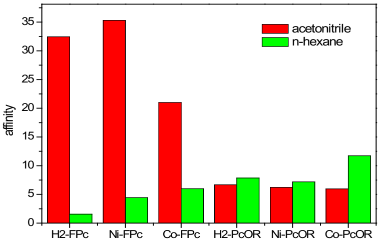

Figure 1: Affinities of fluoro and alkoxy substituted Pcs for acetonitrile and n-hexane in a nitrogen atmosphere

Acknowledgements: The authors acknowledge the financial support by TÜBITAK (The Scientific and Technological Research Council of Turkey) through the TÜBITAK 1001 funding programme (project number 109M212)

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Keywords: chemical sensor, VOC, phthalocyanine

P-176

CHROMATOGRAPHIC FEATURES OF A NEW CAPACITIVE GAS CHROMATOGRAPHY DETECTOR BASED ON DIELECTRIC MEASUREMENT APPLIED TO SIMPLE ALCOHOLIC SAMPLES

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Gas Chromatography (GC) is used to separate small amount of samples (microliter or less) having similar chemical structures in polarity using a column containing stationary phase by elution process with a gas mobile phase where the components of a mixture can be separated. The sample is transformed into volatile derivatives in injection port to separate in analytical column by elution process using mobile inert gasses like N_2, Ar or He. Chromatographic separation is achieved in analytical column [1]. The separated compounds are detected and determined quantitatively depending on measuring physical property by a suitable detector such as Thermal Conductivity Detector (TCD), Flame Ionization Detector (FID), Electron Capture Detector (ECD) and Nitrogen Phosphor Detector (NPD) [2]. GC techniques and detectors need to develop to separate more complicated mixtures having different chemical features.

In this work, some chromatographic specifications of selected sample compounds consisting of commonly used alcohols with different polarity have been determined by newly developed capacitive detector based on dielectric permeability measurements [3]. The chromatographic parameters for these compounds such as minimum detectable quantities (MDQ), the response factors (R_F), linear dynamic range (LDR) of the detector have been determined beside the resolution (R), column efficiency, selectivity, optimum temperature and flowrate for the stationary phase used in the column Supelco SPB-1 Fused Silica Capillary Column with the dimensions 30mx0.25mm and 0.25 μm (film thickness). 100 Hz sinus signal is applied to the cell to obtain induced signal from polar species. The induced signals are demodulated and amplified by lock-in-amplifier (LIA) then sent to integrator to obtain chromatogram. Some chromatographic parameters of the compounds are shown in the figure.

Compound	Dielectric Constant	Retention time, min
1. Methanol	32.7	0.657
2. Ethanol	24.5	0.842
3. i-Propanol	10.9	0.892

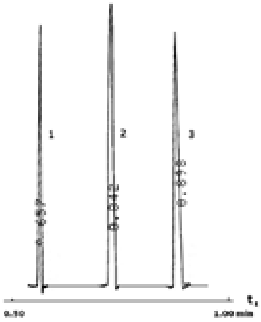

Figure. Chromatographic data of the compounds

Acknowledgements: We would like to thank Erciyes University, Scientific Research Project Center (ERÜ-BAP) for their support through the Project code **FYL-2016-6297.**

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Keywords: Gas Chromatography, Capacitive Detector, Dielectric Measurement, Alcoholic Samples

P-177

SYNTHESIS, CHARACTERIZATION, AND NITRO AROMATIC COMPOUND SENSING APPLICATION OF HEXA-ARMED DANSYL END-CAPPED POLY(ε-CAPROLACTONE) STAR POLYMER WITH PHOSPHAZENE CORE

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Nitroaromatic compounds are hazardous to human health and are registered on the U.S. Environmental Protection Agency's list of priority pollutants for environmental remediation [1].The detection of nitroaromatic compounds, best known as raw materials in explosives preparations, is important in many fields including environmental science, public security and forensics. [2]. In this study, we investigated synthesis, characterization, and nitro aromatic compound (2-nitrophenol, 3-nitrophenol etc.) sensing application of novel hexa-armed dansyl end-capped poly(ε-caprolactone) star polymer with phosphazene core (Figure 1). This polymer was prepared in a two-step synthetic procedure including ring opening polymerization (ROP) of ε-caprolactone (ε-CL) and esterification reactions [3]. Chemical structures of the obtained polymers were confirmed by FTIR and ^{1}H NMR spectroscopic techniques. Then, the fluorescence responses of polymer in the presence of nitroaromatic compound in the analytic media were investigated by fluorescence spectrophotometric method.

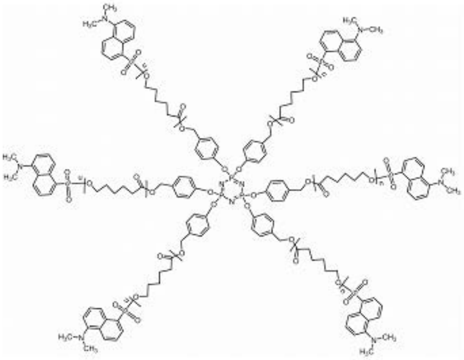

Figure 1: Hexa-armed dansyl end-capped poly(ε-caprolactone) star polymer with phosphazene core.

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Keywords: Nitroaromatic compounds, fluorescence, polymer synthesis

P-178

A NEW BIOSENSOR FOR TOTAL CHOLESTEROL DETERMINATION

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The detection of cholesterol concentration in blood has become essential for a number of diseases in humans, including hypercholesterolemia and hypertension[1]. Various methods have been used for the analysis of cholesterol including spectrophotometric, HPLC and amperometric methods[2]. Indeed, many amperometric biosensors have been proposed to detect cholesterol and offer advantages such as high sensitivity, fast response, low cost, small size, continuous on-line detection and reproducible results. Electrochemical biosensors detect cholesterol by determining the concentration of hydrogen peroxide (H_2O_2)[3]. In these studies, we aimed to analyse the presence of cholesterol with biosensor.

In this study, gold electrodes were coated by polymer films from acetonitrile-water media containing o-phenylenediamine(oPD) and benzoquinone(BQ) with the cyclic voltammetry technique. Cholesterol oxidase (COx, EC 1.1.3.6) enzyme[2] were immobilized onto the surface of Au electrodes. It was observed that Au/oPD-BQ/COx electrodes were appropriate for determination of cholesterol and these electrodes were used for optimization studies. The determination of cholesterol was performed via monitoring oxidation current of enzymatically produced H_2O_2 at +0.70 V vs. Ag/AgCl.

Optimum biosensor conditions were determined for phosphate buffer, 0.1M, pH 7.0 and 30°C, for Au/oPD-BQ/COx enzyme electrode. The linear working range is 9.8×10^{-6}-1.1×10^{-2} mM, and cholesterol detection limit is 9.8×10^{-6} mM. The effects of possible interference species present in real samples on cholesterol oxidase enzyme electrode were examined. Analysis of total cholesterol in serum samples were performed by using proposed Au/oPD-BQ/COx enzyme electrode.

A convenient and simple method to set up a biosensor for cholesterol detection was developed by immobilizing COx onto Au/oPD-BQ/COx electrode. Benzoquinone was generally reproducible and stable. This provided one of the cheapest and simplest approaches to prepare matrix for enzyme immobilization for cholesterol sensing and it could be extended to develop other sensors for detecting many biologically and clinically important materials.

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Keywords: Biosensor, Cholesterol, Cholesterol oxidase

P-179

DEVELOPMENT A NEW BIOSENSOR FOR RAPID DETERMINING OF GLUCOSE-6-PHOSPHATE

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Glucose-6-phosphate dehydrogenase (G6PD; D-glucose-6-phosphate: $NADP^+$ 1-oxidoreductase EC:1.1.1.49) catalyzes the first step of the pentose phosphate pathway, which involves the transformation of glucose 6-phosphate to 6-phosphogluconolactone concomitant with conversion of NADP to NADPH. The NADPH produced protects erythrocytes from oxidative damage [1]. G6PD deficiency is a common enzymopathy affecting more than 400 million people worldwide [2]. G6PD deficiency may result in hemolytic anemia due to drug toxicities, infections during the neonatal period, consumption of beans and stress conditions [3]. We aimed to design a new biosensor for rapid determining of G6PD enzyme activity.

All reagents were purchased from Sigma Aldrich. Firstly, Poly Hema-Mac Nanopolymer coated onto gold electrode, than G6PD enzyme is crosslinked by gluteraldehyde. The immobilized was used to regenerate NADPH from the $NADP^+$. Optimization studies show that assay buffer is 0.5 mM of $NADP^+$ and 1 mM glucose-6-phosphates in 50 mM potassium phosphate buffer, pH 7.4. We obtained NADPH peak at 50 mV of differansiel pulse voltammetry.

In this study, a new immobilization strategies have been used independently to immobilize G6PD. When immobilizing an enzyme on a surface it is most significant point is choose a method of attachment aimed at reactive groups outside the active catalytic and binding site of that enzyme. We developed a new biosensor system preparing potassium ferrociyanide selected as a mediator, in the buffer solution.

A vast number of methods of immobilization are currently available; however, an economical and small process of immobilization is still necessity. It was determined that the method is sensitive, economic, practical and less time-consuming. The current advancement in microprocessing and microelectronic devices has created a promising future for the application of G6PD as biosensors.

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Keywords: G6PD, Biosensor, NADH

P-180

VOLTAMMETRIC TRACE ANALYSIS OF SOME HEAVY METAL IONS BY CARBON PASTE ELECTRODE BASED ON 1-(3-AMINOPROPYL) IMIDAZOLE MODIFIED POLYMER

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Chemically modified electrodes (CMEs) have received considerable attention for years [1-4]. Various methods have been used to introduce modifiers onto the surfaces or into the bulk structure of electrodes. Carbon paste electrodes (CPEs) [5], compared to other types of CMEs, are extremely simple to prepare. Various chemically active species have been introduced into carbon paste electrodes. The complex forming ligands and chelating/ion exchanger resins have been extensively used in CPEs for trace metal preconcentration and voltammetric determinations [6, 7].

In this study, the functional polymer resin (PAPI) (Figure 1) was synthesized by the reaction between the crosslinked chlorosulfonated poly(styrene)-divinyl benzene and 1-(3-aminopropyl) imidazole (API). A carbon paste electrode prepared from PAPI resin was used for the selective determination of the trace amounts of Pb^{2+}, Cu^{2+} and Hg^{2+} ions by square wave anodic stripping voltammetry (SWASV). The effect of some parameters such as paste composition, pH, preconcentration time, reduction potential and time, type of supporting electrolyte and potential scan rate of the stripping step was investigated for optimal sensor responses. It was found that, compare to the bulk CPE, the functional polymer modified electrodes (PAPI-CPEs) significantly enhanced the analytical signal of the metal ions at low ppb levels. The simultaneous determinations of the metal ions were also studied. The PAPI-CPEs were successfully used for the determination of Pb^{2+}, Cu^{2+} and Hg^{2+} ions in tap water and Cu^{2+} in a standard waste water samples by standard addition procedure. The determined copper content was comparable to the certified copper concentration of the waste water sample. The concentration of the heavy metal ions in tap water samples was lower than the detection limits. However, the standard addition procedure was satisfactory for the trace determination of $Pb^{2+}$and Cu^{2+} ions in the range of permissible level given by different national and international health organizations and agencies.

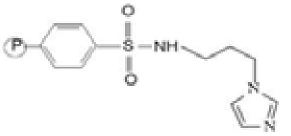

Figure 1: PAPI: Chlorosulfonated poly(styrene)-divinyl benzene crosslinked with 1-(3-aminopropyl) imidazole

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Keywords: Carbon paste electrode, heavy metal sensor, stripping voltammetry

P-181

A STUDY ON THE SENSITIVITY AND SELECTIVITY PROPERTIES OF POLYMER BASED GAS-VAPOR SENSORS

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Some thermodynamical parameters have been extensively used to explore the polymer-solvent interactions and recognition patterns of the polymer based sensor devices [1-8]. Many transduction mechanisms have been proposed to explore sensing characteristic of the various type of sensors. Electrical resistivity measurement is one of the most practical transduction methods in gas sensor technology. The interactions between gas or vapor molecules and polymeric sensing material are mainly based on solubility interactions, which have been modeled and systematically investigated using linear solvation energy relationships (LSERs).[9-11]. Vapor solubility properties are characterized and quantified by solvation parameters related to polarizability, dipolarity, hydrogen bond acidity, hydrogen bond basicity, and dispersion interactions. Some physical properties such as porosities of sensing elements and molar mass, molar volume and vapor pressure of analytes have been also taken into consideration to predict the polymer-solvent interactions and recognition pattern of the sensor devices. The crucial problem with the use of such parameters is in fact a complex quantity.

In this study, the water soluble poly (diphenylamine sulfonic acid) (PSDA) and the diblock copolymer of PSDA with poly(ethylene glycol) (PEG) were used to construct the interdigitated film electrodes (IDEs). Their responses against humidity and various solvent vapors were investigated by impedance measurements. Sorption and desorption behaviors of the solvents were determined under different potential bias and alternating current frequencies. The sensor responses were discussed considering the polar/non-polar and polarizability properties of the polymers and solvents. The effect of alternating current frequency and potential bias on the sensitivity and selectivity of the sensors against polar and non-polar solvents were discussed. It was proposed that the solvent polarity is the primary effect on the electrical conductance and capacitance of both PSDA homo polymer and PSDA-b-PEG block copolymer. The results supported that the dipolarity-polarizability properties of solvents have also a critical role on sensor response at low alternating current frequencies.

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Keywords: Vapor sensors, impedimetric sensors, sensor sensitivity and selectivity

P-182

CHEMICAL CHARACTERIZATION OF *LAVANDULA ANGUSTIFOLIA* MILL. WHICH IS A PHYTOCOSMETIC SPECIES AND INVESTIGATION OF ITS ANTIMICROBIAL EFFECT IN COSMETIC PRODUCTS

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Lavander (*Lavandula* sp.) is a precious essential oil plant from the *Lamiaceae* family. There are 39 lavender species (*Lavandula* sp.) most of which have Mediterranean origin and among them three have high commercial value. While the essential oil quality of the lavender species (British lavender) is high the lavandin species (hybrid lavender) have high essential oil yield [1,2].

In this study, the content of the extracts obtained from *Lavandula angustifolia,* which were grown in Burdur Örtülü locality, was determined via HPLC and GC analysis and the anti-microbial effect of the essential oil *L. angustifolia* was investigated. The study was made with the dried flowers of *L. angustifolia*. Some of the dried flowers were extracted and the essential oil was distilled from the remaining part. Various phenolic compounds in the extract were quantitatively determined by HPLC. Quantitatively cafeic, rosemeric and the 4-hydroxybenzoic acids were the most abundant phenolic acids in the content in decreasing order. In the GC analysis 31 different compounds were determined: Linalool and Linalil Acetate having the highest concentration. Anti-microbial effect was determined against the most frequently encountered microorganisms in the cosmetics: *Candida albicans, Staphylococcus aureus, Pseudomonas aeruginosa, Aspergillus brasiliensis.*

According to the results it is concluded that the essential oil, *L. angustifolia*, can be used either directly or incorporated into the cosmetics without the necessity for any other extra preservative against the said microrganisms. According to the literature these microorganisms, which are frequently found in creams, cause various diseases. It was observed that the essential oil *L. Angustifolia* could completely remove the contamination caused by the said micro-organisms as of the 14. day.

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Keywords: Lavandula angustifolia, phenolic compounds, anti-microbial

P-183

DETERMINATION OF SOME BIOCHEMICAL ACTIVITIES OF *CONVALLARIA MAJALIS*

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In this study, Convallaria Majalis flowers which is grown up in Muğla picked up and some biochemical activities were investigated.

Enzymes are biological catalysts, accelerating chemical reactions in living organisms and providing a yield of 100%, without allowing to no side product. The enzymes used in almost all areas of industry usually obtained from microorganisms. Due to the presence of some diseases to the people from microbial sources, increased doubts about the microbial enzymes used in the production of food and cosmetic ingredients. This development has led to researchers seek new sources of plant enzymes.

Proteases enzymes catalayses hydrolysis of proteins to peptides and amino acids. They are one of the important groups both in biochemical and industrial applications. Three Phase Partitioning (TPP) were used for purification of the protease from Convallaria Majalis flowers. Optimal pH and temperature and Km and Vmax values for casein, azocasein, azoalbumin, gelatin, hemoglobin substrats for purified enzyme were calculated. Sodium dodecyl sulphate polacrylamide gel electrophoresis was applied for control of the protease enzyme purified from Convallaria Majalis and molecular weight of purified protease enzyme is determined as 31.2 kDa by using gel filtration chromotografphy. The effect of 10 mM, 1 mM, 0.1 mM SDS, EDTA, β-merkaptoetanol compounds and 10 mM, 1 mM, 0.1 mM, Ca^{+2}, Hg^{+2}, Fe^{+2} on enzyme activity were studied.

As a result, protease enzyme was purified from Convallaria Majalis flowers with TPP. Also phenolic component was determined. These components: Protocatechuic acid (1.851 ± 0.477), p-OH benzoic acid (1.777 ± 0.198), catechin (2.119 ± 0.159), caffeic acid (9.721 ± 1.363), p-coumaric acid (0.342 ± 0.132), ferulic acid (0.629 ± 0.030), t cinnamic acid (0.497 ± 0.011). Proteases enzyme and phenolics compounds amount demonstrate value and importance in cosmetic sectors. Also a very good moisturizing products.

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Keywords: Muguet, protease enzyme, TPP

P-184

EXTRACTION OF SOME MEDICINAL AROMATIC PLANTS USED AS RAW MATERIALS; INVESTIGATION OF ANTI-BACTERIAL AND ANTIOXIDANT PROPERTIES

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Thousands of years ago, people have recognized the healing power of plants and took advantage of it to healthy living. Preparation of extracts from plants and starting to use them as medicines in China is approximately goes back to BC 2700. The plants have an important place today as in the past. Especially in today's world that emphasize the importance of return to nature, plants that grow spontaneously in nature, has become an important raw material for many industries in the global market position. Since human existence plants are not only used as drug but also they used for food and cosmetics purposes. Also in cosmetics particularly in cream formulations mostly plant-derived raw material are preferred. The main reasons of this is medicinal plants have depending on their rich active ingredients a large effect profile and they are more compatible with biological systems and more importantly, there is a higher reliability. Turkey has a rich vegetation as geographical location. Take place in the middle of three different geographical areas and major climatic zones such as the Mediterranean, Asian, Europe, our country has become a rich country in terms of plant diversity and endemic plants. Turkey has registered about 9,000 species of flora. Approximately 1000 of them are raw materials of drugs and spices and especially among the population is used as tea or condiment. 30% of species of Turkey's flora are aromatic plants. Western and Southeastern Anatolia Region is rich by plants containing essential oils. Around 140 medicinal plants are registered in the 1948 and 1974 Turkish codex but today about 500 plants are used for medicinal purposes. According to this information; in this study obtained extracts of some plants (*Aesculus hippocastanum*, *centaury, etc.*) that are grows easily in our country's region and have commercial importance were used in the formulations of cream. Then, anti-bacterial and antioxidant properties of the obtained cosmetic products with the addition of plant extracts were investigated.

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Keywords: Aesculus hippocastanum, Centaury, extraction, antibacterial, antioxidant properties

P-185

EFFECT OF EXERCISE AND CALORIC RESTRICTION ON GASTRIC TISSUE GLUTATHIONE, GLUTATHIONE-S-TRANSFERASE AND SIALIC ACID IN METABOLIC SYNDROME MODEL

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Gastric tissue is an important tissue that produces a number of bioactive molecules, with important roles in the metabolism, inflammation and energy homeostasis [1].

The aim of this study is to examine the effects of exercise and / or caloric restriction on rat gastric tissue in metabolic syndrome model induced by high fructose diet.

Sprague-Dawley male rats were divided into five groups: control (C), metabolic syndrome (M), metabolic syndrome with exercise (ME), metabolic syndrome with caloric restriction (MRc) and metabolic syndrome with exercise and caloric restriction (MERc). To induce metabolic syndrome 10% fructose solution [2] was given to rats in drinking water for 3 months. Exercise and caloric restriction were applied to the related groups for 6 weeks after the induction of metabolic syndrome. Blood glucose and glutathione (GSH) [3], sialic acid (SA) [4] levels and glutathione-S-transferase (GST) [5] activity were measured in rat gastric tissue homogenates.

Blood glucose level increased significantly in group M compared to group C. It was normalized by both caloric restriction and exercise application. In gastric tissue, GSH level and GST activity decreased, SA level increased in group M compared to group C. Caloric restriction with exercise caused a significant increase in GSH level and GST activity in group MERc compared to group M. Caloric restriction alone decreased SA levels significantly in MRc group compared to group M.

Gastric tissue damage and decreased antioxidant levels occurred with fructose diet and were corrected with caloric restriction and/or with exercise.

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Keywords: Metabolic syndrome, exercise, caloric restriction, glutathione, glutathione-S-transferase, sialic acid

P-187

ANTIOXIDANT ACTIVITIES OF SOME 2-AMINOBENZIMIDAZOLE DERIVATIVES CONTAINING AMINO ACIDS/PEPTIDS

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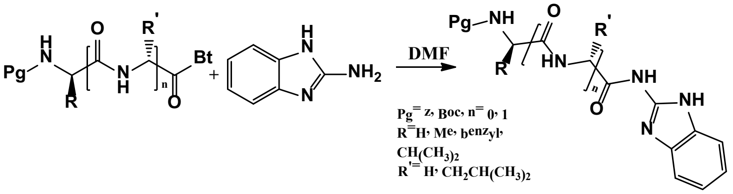
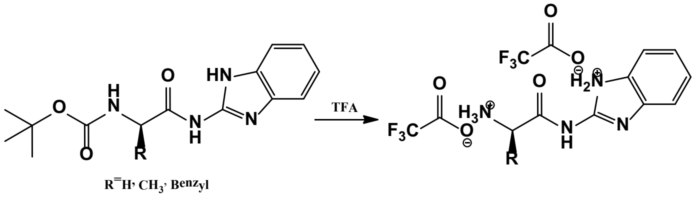
2-Aminobenzimidazole moiety is exceptionally valuable compound and the central building block of a number of pharmaceutical active benzimidazole derivatives such as mebendazole, fenbendazole, carbendazim and oncondazole. 2-Aminobenzimidazole moiety is also present in the structure of a variety of chemosensor receptor used for the selective recognition of anions with an important role in several biological functions, such as phosphate, acetate, iodide and dicarboxylate. This moiety is a photoactive compound, which upon excitation gives rise to a variety of signals, potentially useful for the study of supramolecular interactions with proteins and other biomolecules [1, 2]. On the other hand, amino acids and short peptide sequences possess the broad range of biological activities.

In this study, percent antioxidant activities of synthesized 2-aminobenzimidazole derivatives (summarized at below) at different concentrations (12.5-125 μg/mL) in DMSO were determined by using the method of Blois [3]. 2-Aminobenzimidazole derivatives studied in this work generally show moderate antioxidant activity compared to the control antioxidant compounds (BHA and α-tocopherol).





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Keywords: Antioxidant, benzimidazole, amino asit, peptide

P-188

THEORITICAL STUDIES ON THE THERMODYNAMIC PROPERTIESAND DETONATION PROPERTIES OF CYCLOTRIMETHYLENE TRINITRAMINE (RDX) WITH ALUMINUM AND BORON METALS

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The B3LYP/6-311++G(2df,2p) density functional theory (DFT) method was used to investigate molecular geometry and thermodynamic properties of RDX and RDX derivatives containing Al and B metals. The detonation velocity (D) and detonation pressure (P), estimated by using Kamlet–Jacobs and in literature equations, respectively. Total energies (Et), frontier orbital energy (E_{HOMO}, E_{LOMO}), energy gap ($\Delta E_{LUMO}-_{HOMO}$) and theoretical molecular density (ρ) were calculated with Spartan 14 software package program. It was shown that the presence of aluminum and boron atoms affects the good thermal stabilities. The results show that the composite RDX-Al, RDX-B derivatives have higher detonation performance and higher density than RDX. RDX-Al derivatives appeared to be superior to RDX-B mixtures in terms of these parameters. These results have not only shown that these compounds may be used as high energy density compounds, but also provide some useful information for further syntheses.

Keywords: DFT calculations, Detonation performance, RDX

P-189

OXIDATIVE DNA DAMAGE PROTECTIVE ABILITY OF *PUNICA GRANATUM* L.

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During recent years, there has been considerable interest in identifying natural sources with antioxidant activities to prevent oxidative stress-induced damages. Epidemiological findings have shown that consuming foods and beverages having high levels of phenolic compounds decreases the risk of many diseases and protective against certain forms of cancer [1].

Punica granatum L., commonly known as pomegranate belongs to the family Punicacea. It is one of the important and the oldest edible fruit, cultivated Mediterranean countries [2]. Turkey is one of the main pomegranate producing countries in the world and it is possible to grow pomegranates in most parts of Turkey. The total phenolic and flavonoid capacity and hepatoprotective activity of Derik pomegranate juice were also investigated [3].

The present study was design to investigate the protective ability of Derik pomegranate juice and peel extract against DNA damage induced by Fenton system [4]. The results indicated that both juice and peel have significant protective effect on oxidative DNA damage.

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Keywords: DNA damage, fenton chemistry, Punica granatum L.

P-190

PESTICIDE INDUCED DNA DAMAGE

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Pesticide exposure can cause a range of neurological health effects such as memory loss, loss of coordination, reduced speed of response to stimuli, reduced visual ability, altered or uncontrollable mood and general behavior, and reduced motor skills. Other possible health effects include asthma, allergies, and hypersensitivity, and pesticide exposure is also linked with cancer, hormone disruption, and problems with reproduction and fetal development.

Experimental data revealed that various agrochemical ingredients possess mutagenic properties inducing gene mutation and chromosomal alteration or DNA damage. Incresing incidence of cancer, chronic kidney diseases, suppression of the immune system, sterility among males and females, endocrine disorders, neurological and behavioral disorders, especially among children, have been attributed to chronic pesticide poisoning [1].

Fluoxastrobin is a new strobilurin-type fungicidal active ingredient for the control of fungal diseases such as early blight, late blight, leaf spots, leaf rust, and Rhizoctonia solani.

Imazamox is a systemic herbicide that moves throughout the plant tissue and prevents plants from producing a necessary enzyme, acetolactate synthase (ALS), which is not found in animals. Susceptible plants will stop growing soon after treatment, but plant death and decomposition will occur over several weeks.

This study was designed to use the plasmid relaxation assay to describe the association of markers of DNA damage with pesticide exposure [2]. The DNA damage activity of Fluoxastrobin and Imazamox were checked on pBluescript M13+ plasmid DNA (3.2 kb) in the absence and presence of Cu (II) ions.

It has been found that the Fluoxastrobin and Imazamox can effectively promote damage of plasmid DNA. The degree of DNA damage was found to be depend on both to the concentration of pesticide and reaction time.

An important finding of this study is that Fluoxastrobin and Imazamox had DNA damage potential, which warrants for further investigations to correctly evaluate the hazards of exposure to these chemicals. This study produced support the hypothesis that pesticide exposure is involved in the induction of oxidative damage to DNA and identified chemical groups of pesticides which should be given greater attention in future investigations.

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Keywords: DNA damage, Fluoxastrobin, Imazamox

P-191

ANTIPROLIFERATIVE EFFECT OF CHERRY LAUREL

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Cherry laurel (*Prunus laurocerasus*) belongs to Rosaceae family. Its fruits are consumed freshly, dried or prepared in marmalade and its leaves containing cyanogenic glycosides have healing activity of a well-known Anatolian folkloric remedy. Herein, we investigated the antiproliferative and cytotoxic effects of cherry laurel fruit extracts on HeLa (Human Cervix Carcinoma), HT29 (Human Colorectal Adenocarcinoma), C6 (Rat Brain Tumor Cells), and Vero (African Green Monkey Kidney) cell lines. The extracts of cherry laurel fruit have been shown to exhibit slightly antiproliferative effects on various cancer cell lines at high concentration. We assessed the ability of extracts of cherry laurel fruit to devastate the membrane of cells. Results indicated that cherry laurel fruit extracts destroys cellular membrane in tumor cell lines at high concentration merely. The results of this study not support the efficacy of cherry laurel fruit extracts as an anticancer agent for cancer cells, but it suggests that cherry laurel fruit extracts may be used through reducing cytotoxicity a potential adjuvant therapy to current chemotherapeutic agents.

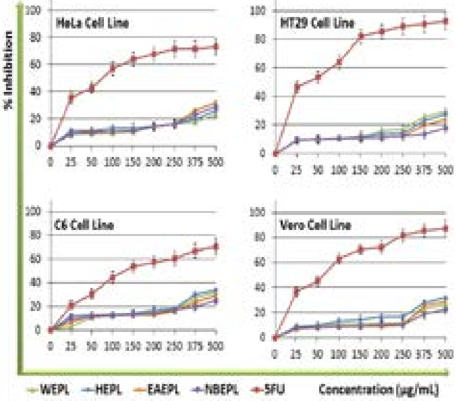

Figure 1. Antiproliferative activity of aqueous (WEPL), hexane (HEPL), n-butanol (NBEPL) and ethyl acetate (EAEPL) extracts of cherry laurel and positive control compound, 5FU on HeLa, HT29, C6, and Vero cell lines. Percent inhibition was reported as mean values ± SEM of three independent assays ($P < 0.05$). Each experiment was repeated at least three times for each cell line.

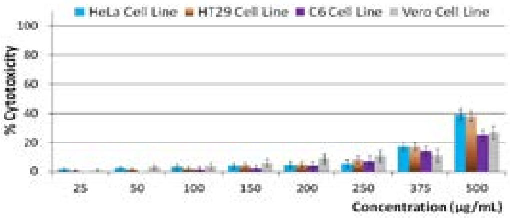

Figure 1. Cytotoxic activity of cherry laurel extracts on HeLa, HT29, C6, and Vero cell lines. Cell lines were incubated with various concentrations of cherry laurel extracts for 24 hours. Percent cytotoxicity was reported as mean values ± SDs of three independent assays ($P < 0.05$).

Keywords: Antiproliferative effect, Cytotoxic activity, Cherry laurel, HeLa, HT29, Vero

P-192

ANTICANCER ACTIVITY OF *PAPAVER SOMNIFERUM*

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This work describes the pharmacological activity of extracts of *Papaver somniferum*, a poppy species. *P. somniferum* products are still considered as a unique source of drug for many diseases. The present study was designed to determine antiproliferative and cytotoxic effects of *P. somniferum* extracts on HeLa (Human Cervix Carcinoma), HT29 (Human Colorectal Adenocarcinoma), C6 (Rat Brain Tumor Cells), and Vero (African Green Monkey Kidney) cell lines. Alkaloids-rich extracts of *P. somniferum* exhibited antiproliferative effects on various cancer cell lines, especially at high concentrations (Table 1). We assessed the ability of extracts of *P. somniferum* to harm the membrane of the cells. Results indicated that *P. somniferum* extracts destroy cellular membrane in tumor cell lines at high concentrations. Remarkably, the LDH test results disclosed that cytotoxicity of *P. somniferum* on cells was low at mid concentrations (Figure 1). This may indicate its cytostatic potential. The results of this study support the efficacy of *P. somniferum* extracts as an anticancer agent.

Table 1. IC50 values for *Papaver somniferum* extracts

IC50 (µg/mL)	HT29 Cells	HeLa Cells	C6 Cells	Vero Cells
EPST	174.72	130.70	176.71	153.92
HPST	219.97	209.60	271.50	190.82
MPST	247.37	210.25	261.31	210.62
5FU	88.24	83.80	95.09	84.57
EPSC	325.04	271.83	299.93	350.20
HPSC	348.79	290.18	323.67	376.11
MPSC	371.85	301.06	318.25	390.64
5FU	87.06	82.37	83.79	85.43
EPSS	225.62	120.52	170.60	113.98
HPSS	186.17	226.01	218.57	201.39
MPSS	128.90	118.76	203.49	170.30
5FU	91.23	82.16	94.21	88.74
EPSL	195.17	264.40	146.69	134.34
HPSL	189.58	131.61	378.70	289.96
MPSL	212.95	174.62	155.38	143.25
5FU	84.26	86.54	91.44	85.71

Table 1. Antiproliferative activity of ethanol (EPST, EPSC, EPSS, and EPSL), hexane (HPST, HPSC, HPSS, and HPSL), and methanol (MPST, MPSC, MPSS, and MPSL) trunk, capsule, stem, and leave extracts, respectively, of *Papaver somniferum* and positive control compound, 5FU on HeLa, HT29, C6, and Vero cell lines.

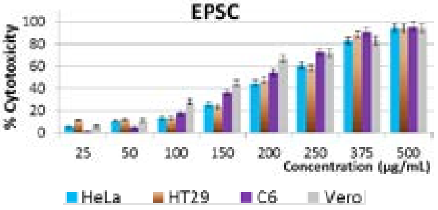

Figure 1. Cytotoxic activity of *Papaver somniferum* capsule ethanol (EPSC) extracts on HeLa, HT29, C6, and Vero cell lines. Cell lines were incubated with various concentrations of extracts for 24 hours. Percent cytotoxicity was reported as mean values ± SDs of three independent assays (P < 0.05).

Keywords: Antiproliferative effects, Cytotoxic activity, Papaver Somniferum

P-193

ASSESSMENT OF ADULTERATION OF COUGH SYRUP AND GLYCEROL WITH DIETHYLENE GLYCOL BY MEANS OF QUANTITATIVE NMR AND ATR-FTIR SPECTROSCOPY COMBINED WITH CHEMOMETRICS

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Diethylene glycol (DEG) is one of the compounds that is very similar to glycerol. Just like glycerol, it's odorless, colorless and tastes sweet and highly soluble in less water dissolving compounds. Because of these high qualities, it's been preferred in manufacture of different products for domestic and industrial use. For example it's used in antifreeze compounds, dyes, resins among others. DEG has high chances of being ingested directly through the mouth mainly because of its sweet taste. Once ingested, it is digested into toxic acids that have massive effects on the kidney in addition to the central nervous system. In different places of the world most especially due to financial instability, the more expensive glycerol has been replaced with the less expensive diethylene glycol during the manufacture of glycerol containing compounds and products some of which are pharmaceutical products. Consumption of these products resulted into numerous deaths as being reported around the world. Using combined Infrared and NMR spectroscopy together with chemometrics I examined an adulterated cough syrup and glycerol. The process yielded good results on prediction of identification and how much of DEG was in the syrup in concentration ranges from nothing to 100% in just 5ml of the syrup.

Keywords: Diethylene glycol; Glycerol; Nuclear magnetic resonance and Infrared spectroscopy, principle component analysis, Partial linear squares

P-194

INTERRELATION AMONG SERUM LITHIUM LEVELS AND BONE METABOLISM AND SOME BIOCHEMICAL PARAMETERS IN PRE AND POST-MENAUPOSAL WOMEN

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In the period when women try to adapt themselves from a period, when they are physiologically stimulated with estrogen and progesterone, to a period, when they are deprived of these hormones, decrease in estrogen levels lead to serious complications such as bone loss and osteoporosis [1].

The target of this study is to determine the interrelation among serum Li level on bone metabolism (Ca, P, Parathormon, and Vitamin-D), sex and metabolic hormones (estrogen, FSH, LH and TSH), and some biochemical parameters in premenopausal and postmenopausal women. The study is carried out with 10 women: 5 premenopausal and 5 postmenopausal women. The serum Li levels, bone metabolism indicators (i.e., ALP, Ca, P, Mg, Cu, Zn) and some biochemical parameters such as serum tryglyceride, alkalene phosphatase, total cholesterol, HDL, LDL and cholesterol levels were determined. The estrogen blood level of women in menopause period was found to be lower than that of women in pre-menopause period ($p<0.01$) and the FSH level was found to be higher ($p<0.01$). In the lipid profile the triglyceride level in the post-menopause period was found to be low ($p<0.05$) and HDL ($p<0.001$), LDL ($p<0.001$) and the cholesterol levels were found to be high ($p<0.001$). The alkalene phosphatase ($p<0.001$) and Vitamin-D levels ($p<0.001$) were found to decrease. When the mineral levels were investigated no meaningful difference was observed in the serum magnesium and copper levels while zinc ($p<0.01$) and phosphorus ($p<0.005$) levels were observed to increase, the calcium levels ($p<0.05$) decreased and Li levels considerably decreased ($p<0.0001$).

According to the results obtained it was determined for the first time that Li defficiency can be related with menopause and the related diseases and thus Li therapy can be used in developing new treatment protocols of menopause as an alternative method.

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Keywords: Bone metabolism, serum, lithium levels

P-195

SYNTHESIS AND CHARACTERIZATION OF SOME NOVEL 1-THIAZOLYL-3-BENZIMIDAZOLYLPYRAZOLE DERIVATIVES AND INVESTIGATION OF THEIR HERBICIDE EFFECTS ON THE SEEDS OF *Lepidium sativum L.*

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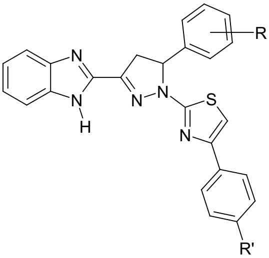
Herbicides used to fight with allelopathic plants causing harmful effect in agricultural lands are very important to obtain good agricultural products. Researchers showed that the compounds containing heterocyclic groups owned remarkable microbiological effects [1,2]. There were some phytobacteria required for germination of seeds. Any microbiological effect can damage the phytobacteria and it can be expressed as phytotoxic effects [3]. For this aim, a series of original compounds was synthesized to investigate phytotoxic effects. Some arylacetyl bromide derivatives were synthesized by many different steps according to substituent before the syntheses of target compounds didn't start. These starting compounds were used for derivatization studies in the final step. Besides, a series of reactions were applied back to back to attain main starting compounds. Thus 2-acetylbenzimidazole was obtained with many steps. After all these steps, the whole need starting materials were synthesized to attain the desired target compounds. The starting compound, 1H-2-acetylbenzimidazole, was transformed to chalcone derivatives with suitable benzaldehyde derivatives. The chalcone derivatives were reacted with appropriate arylacetyl bromide which was synthesized before and it has been obtained the target compounds, 1-Thiazolyl-3-benzimidazolylpyrazole Derivatives. Finally, 2-(4-(1-Substitutedbenzimidazole-2-yl)thiazole-2-ylamino)-4-arylthiazole derivatives to be synthesized as target compounds were absolutely original compounds so their structures were elucidated by using elemental analysis; IR; NMR; MS spectral data. Synthesized compounds were tested on seeds of *Lepidium sativum L.* (cress) to study of biological activities. Consequently, it was reported phytotoxic effects of the compounds.



Acknowledgements: This work was supported by grant from the Scientific Research Projects Coordination of Mehmet Akif Ersoy University (MAKU-BAP).

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Keywords: Benzimidazole, Pyrazole, Thiazole, Herbicide Effect, Phytotoxic Effect, Seeds of *Lepidium sativum L.*

P-196

SYNTHESIS, CHARACTERIZATION AND PHENOXAZINONE SYNTHASE ACTIVITY OF NOVEL AMINOKETOOXIME LIGAND AND ITS Cu(II), Mn(II) COMPLEXES

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Metal ions have been found to play a crucial role in many biological systems. At least one-third of all proteins appear to contain metal ions and even the nucleozymes such as ribozymes (RNA enzymes) appear to be metalloenzymes [1]. These metal ions can modify electron flow in a substrate or enzyme, thus effectively controlling an enzyme-catalyzed reaction. It is not possible to use the natural enzyme as a drug due to its delivery problems and instability in solution. Therefore, synthetic compounds able to mimic natural enzymes have been designed and studied by the researchers [2,3]. Bioinorganic chemistry comes into play. Bioinorganic chemistry encompasses a variety of disciplines, ranging from inorganic chemistry and biochemistry to spectroscopy, molecular biology, and medicine etc. [4,5].

In this study, 4-chloroacetylbiphenyl was prepared from biphenyl as a starting material. Then, 4-biphenylhydroxymoylchloride (ketooxime) was obtained from the reaction of 4-chloroacetylbiphenyl with alkylnitrite in the presence of dry HCl. 2-(biphenyl-4-yl)-N'-hydroxy-N-(2-hydroxy-5-nitrophenyl)-2-oxoacetimidamide was originally synthesized from the reaction of this ketooxime with 2-amino-4-nitrophenol in the cold medium. At the last step of synthetic process, the reaction of ligand with proper metal salts, Cu(II) and Mn(II) complexes were obtained by precipitation. The structures of synthesized compounds were illuminated by elemental analysis, ICP-OES, FT-IR, ^{1}H- & ^{13}C-NMR, UV-Vis, magnetic susceptibility and conductivity measurements. In addition, complexes have been tested for their phenoxazinone synthase-like activity which comprises the conversion of 2-aminophenol to phenoxazinone.

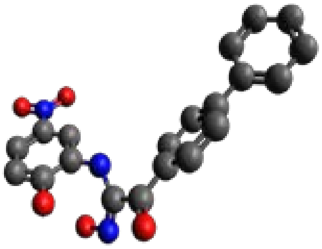

Figure 1: Optimized structure for the synthesized novel ligand

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Keywords: Spectroscopy, complex, enzyme activity, characterization, phenoxazinone synthase

P-197

SYNTHESIS AND CHARACTERIZATION OF METALLO PHTHALOCYANINES CONTAINING 2,3,5-TRIMETHYLPHENOL MOIETIES

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Phthalocyanine (Pc) compounds have been widely studied for over 80 years due to their varied applications. Unsubstituted and substituted phthalocyanines are important commercial dyes and pigments. A variety of technological applications of phthalocyanines have been actively investigated for purposes such as optical discs, laser dyes, liquid crystals, electrocatalysis, electrochromism and chemical sensors, etc [1].

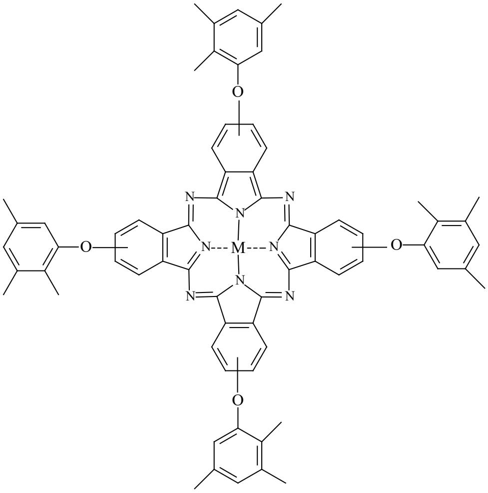

Figure 1: Metallo Phthalocyanines Containing 2,3,5-Trimethylphenol (M=Cu, Co)

In this work, 4-(2,3,5-Trimethylphenoxy)phthalonitrile was synthesized by treating 4-nitrophthalonitrile with 2,3,5-trimethylphenol in DMF using K_2CO_3 as the base for nucleophilic displacement reaction and gave high yield (73,51 %) [2]. Copper(II) and cobalt(II) phthalocyaninate compounds were obtained by the treatment of dinitrile derivative with anhydrous $CoCl_2$ and Cu(I)Cl. Structrures of all synthesized compounds were determined by elemental analyses, UV/Vis, ^{1}H-NMR, ^{13}C-NMR, Mass and IR spectroscopy. Experimental and quantum mechanical Methods of 4-(2,3,5-Trimethylphenoxy) phthalonitrile were investigated using Gaussian 09W and GaussView 5.0.9.

Acknowledgements: This work was supported by the research fund of the Amasya University (FMP-BAP 15-0157)

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Keywords: phthalocyanines, phthalonitrile, 2,3,5-trimethylphthalonitrile

P-198

SYNTHESIS AND CHARACTERIZATION OF NEW ZINC PHTHALOCYANINE CONTAINING ANTHRACENE MOIETIES FUNCTIONALIZED WITH "CLICK" REACTION

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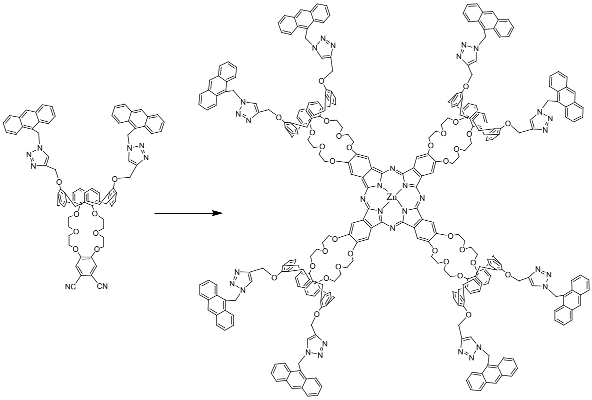
Phthalocyanine compound by Tcherniac and Braun in 1907 and acetic anhidritten phthalimide was obtained as a by-product during the synthesis of o-siyanobenzamid [1]. Phthalocyanines are also macrocyclic compounds with high conjugations. These molecules are used in different application areas such as optical data storing, laser, nanotechnology, catalyst, chemical sensor technology, and photodynamic therapy. Calix[n]arenes, p-*tert*-butyl phenol with formaldehyde in basic medium by the reaction of condensation phenolic hydroxyl groups in ortho methylene bridges corners connected to each other macrocyclic molecules are defined as consisting of [2]. Click chemistry is a chemical philosophy introduced by K. Barry Sharpless in 2001 and describes chemistry tailored to generate substances quickly and reliably by joining small units together. This reaction is not a sophisticated; it is a concept that mimic nature [3].

In this study, four different units have been combined in the same molecule such as phthalocyanine core, crown ether, triazole groups and anthracene moieties. This "Click" reaction was performed by 9-azidomethyl-anthracene to substituted phthalonitrile compound. Finally zinc phthalocyanine synthesized from this phthalonitrile derivatives. Structures of synthesized compounds was characterized by using ^{1}H NMR, ^{13}C NMR, FT-IR, UV-Visible and mass spectroscopy techniques.



Acknowledgements: This study was supported by the Research Fund of Pamukkale University, Project Number: 2011BSP031 (Denizli-Turkey).

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Keywords: Anthracene, zinc phthalocyanine, click reaction

P-199

SYNTHESIS AND CHARACTERIZATION OF NEW ZINC PHTHALOCYANINES CONTAINING TRIAZOLE GROUPS IN PERİPHERAL AND NON-PERİPHERAL POSITIONS

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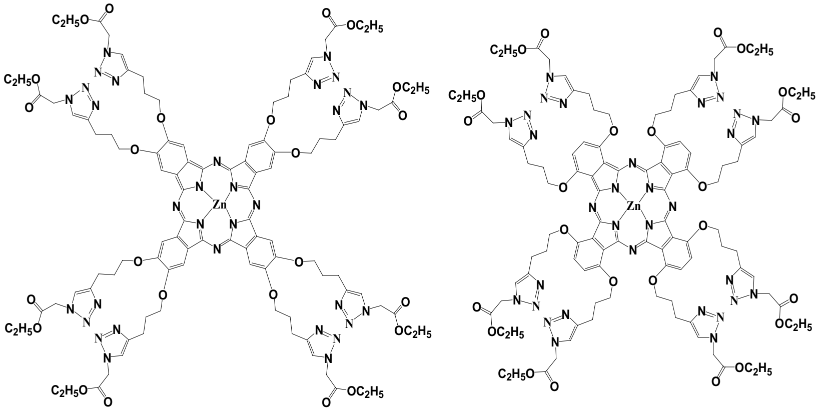
Phthalocyanines, high conjugation 18-π electrons with a 16-members macrocyclic compounds [1]. This compound may function from different location, such as peripheral or non-peripheral. Especially, Pc derivative of non-peripheral position unlike peripheral have a long wavelength absorption in the near IR region of the spectrum [2]. Several topics such as PDT and near-IR applications occur due to substitution of non-peripheral positions. "Click" chemistry, in 2001, K. By Barry Sharpless, nature, inspired by the fact that the formation of molecules developed in the merger of small modular units [3].

In this study, the substituted zinc phthalocyanine derivatives have been synthesized in good yields by the cyclotetramerization reaction of substituted phthalonitriles containing alkyl-linked triazole moieties at peripheral or non-peripheral positions. The novel zinc phthalocyanines have been characterized by the combination of elemental analysis, ^{1}H-NMR, ^{13}C-NMR, FT-IR, UV-vis and MS spectral data.



Acknowledgements: This study is supported by TUBITAK (Project number: 114Z441)

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Keywords: Phthalocyanines, Triazole Groups, Peripheral Positions, Non-Peripheral Positions

P-200

SYNTHESIS OF NEW Ni-MI$_2$ (M = Zn, Cd) HETERODINUCLEAR COMPLEXES AND INVESTIGATION OF THEIR PHOTOVOLTAIC PROPERTIES

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Seeking alternatives to hydrocarbon-based energy resources for a better quality of life has always been an area of interest and research. Wind and solar systems which allow energy production with very simple technologies and nuclear energy which requires mastery of high technology are the most sought-after studies in this content. Especially, solar energy is seen as a source of sustainable and low cost energy. When the recent literature is examined, it has been seen that there is an increased number of the studies towards to preparation of organic/polymer, plastic, metal-organic (etc.) solar cells. Despite the high number of studies already conducted in the context of solar cells, the efficiency of the currently used organic or metal-organic solar cells (3-3.5 %) is lower than inorganic analogues (20 %). However, this disadvantageous situation is being balanced with their high absorption coefficient and long battery life. The researches related with chemical properties of solar cells have brought out alternative usage areas such as thin film transistors (TFT), liquid crystals (LCD) or organic light emitting diode (OLED). Since the invention of dye-sensitized solar cells (DSSCs) by Grätzel and O'Regan in the field of solar energy absorption [1], DSSCs are still among the most studied topics due to their simple device structure, ease preparation, low cost and high efficiency.

The aim of this study is to synthesize the hetero-dinuclear transition metal complexes with N- and O-donor ligands and to investigate their usage as an electron donor in the photoelectric cells. Substrate simultaneously interacts with the two metal ions, especially at the transition metal complexes in which the distances between two metal ion is 3-6 Å. Therefore, when the metal atom couples setteled in appropriate geometric structure, electron transition occurs over the substrate [2]. In this study two new hetero-dinuclear complexes (NiZn and NiCd) were synthesized and their structures were analyzed with X-ray diffraction. Following the investigation of the thermal stability and UV-absorption properties of the coplexes, Grätzel type solar cells were prepared and their current-pottentials (I-V) at the six visible wave length and white light were measured and then their photovoltaic parameters were calculated. Furthermore, theoretical calculations regarding with the effect of metal type on absorption was made by modelling the X-ray data of the complexes.

Acknowledgements: This work was supported by the Scientific Research Foundation of Ankara University under Grant 12B4240001.

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Keywords: Dinuclear complexes, Photovoltaic, Synthesis

P-203

METAL SENSITIVE FUNCTIONAL ZINC PHTHALOCYANINE; SYNTHESIS, CHARACTERIZATION, SPECTROSCOPY

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Functional phthalocyanines bearing metal binding donors are of particular chemical interest because of their tendency to specific analytes, and capable of binding multiple metal ions for the development of new sensor molecules/macrocycles. Electronic spectra of the modified phthalocyanines exhibited distinct changes in the UV/vis region, both absorbance and fluorescence, in response to treatment with metal ions in solution. Fuctional ligands able to recognize transition and lanthanide metal ions will make them valuable for the development of high-tech applications [1,2].

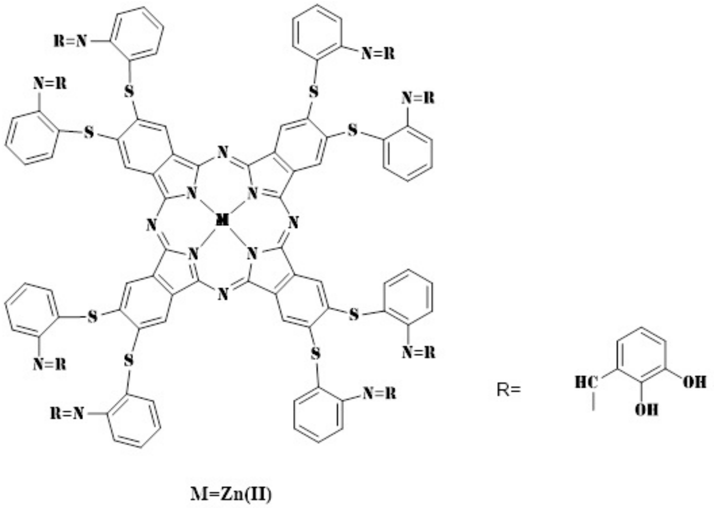

Figure 1: 2,3,9,10,16,17,23,24-octakis-(2-aminophenylthio) metal(II) phthlocyanine

In this study, we have prepared soft or hard metal ion sensor 2,3,9,10,16,17,23,24-octakis-(2-amino-phenylthio) metal(II) phthlocyanine (M= Zn(II))and their schiff-base derivatives for complexation with Pd2+, Ag+ . The new synthesized compounds have been characterized by elemental analysis, FTIR, 1H- and 13C-NMR, UV-Vis and MS (Maldi-TOF) spectral data.

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Keywords: metal,phthalocyanine,sensor

P-204

INVESTIGATION OF THE ANTIOXIDANT ACTIVITY OF DIFFERENT PART OF MAHALEB CHERRY (*PRUNUS MAHALEP* L.)

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Herbs and spices have been used for many purposes including medicine, aroma, and preservatives, etc. Constituents of herbs and spices are functional and posses some biological activities especially antioxidants thus improve human health[1].

The genus *Prunus* belongs to the subfamily Prunoidae in the *Rosaceae* family and has vital plant species that produce a great deal of industrial raw materials for the horticulture, ornamental, food, and pharmaceutical industries. Of these plant species, is a large perennial shrub or deciduous small tree that is found throughout Mediterranean countries, as well as central Europe, northern Africa, and western and central Asia. The plant, which is known as the St. Lucie cherry or the Rock cherry in Europe; the mahlab, mahleb, mahaleb cherry in Northern Africa, the Middle east; and Mahlep in Turkey[2].

The main objective of this study was to evaluate the antioxidant activity of parts of mahaleb (fruits, leaves and seeds) and its chemical contents of essential oil collected from Tokat. Methanol extract was used for total phenolic content and antioxidant capacity. Two different methods were used to evaluate antioxidant capacity: 1,1-diphenyl-2-picrylhydrazyl (DPPH) and ferric reducing antioxidant power (FRAP) assay. Wide variation in total phenolic compounds ranged from 38.3 to 18.4 mg GAE/g. Results of FRAP ranged from 418.7 to 215.9 µmol TEAC/g. Percentage of free radical scavenging activity of the plant parts ranged from 37.3 to 3.7 at 80 µg/mL concentration. It is clearly observed that methanol extract of leaf of Mahaleb has the highest antioxidant activity than its fruit and seeds.

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Keywords: Antioxidant, Mahaleb, DPPH, FRAP, Total Phenolic

P-205

INVESTIGATION OF ANTIOXIDANT ACTIVITY OF MAHALEB CHERRY (*PRUNUS MAHALEP* L.) DURING RIPENING OF FRUIT

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The mahaleb cherry (*Prunus mahaleb* L.), a wild member of the *Rosaceae* family, is an important rootstock for cherry and sour cherry cultivars. Besides horticultural importance, all parts of the plant, specifically the seeds and fruits have been used to give flavor and taste to a variety of its cousins in Mediterranean countries for centuries. The seeds of mahaleb are an important industrial crop in Turkey; using folk medicine of the other parts of the plant has also been recorded[1]. The plant parts have been used as a tonic to heal various ailments in traditional medicine in Turkey[2]. Decoctions prepared from stems, fruit stalks, leaves and flowers have locally been used as an herbal tea to treat colds and asthma in the winter[3].

The aim of the study was to evaluate and compare the total phenolic compound and antioxidant capacities of unripe and ripe of fruits and seeds mahaleb plant collected from Tokat. Total phenolics and total antioxidant capacities were analyzed by two different methods: 1,1-diphenyl-2-picrylhydrazyl (DPPH) and ferric reducing antioxidant power (FRAP) assay. Total phenolic compounds was found between 29.2 and 63.2 mg GAE/g. FRAP activity was found from 266.6 to 333.7 µmol TEAC/g. DPPH activity ranged from 29.3 to 5.6 % at 80 µg/mL concentration. According to the results it can be say that total phenolic content and antioxidant capacity of unripe samples are higher than the ripe samples in both of fruit and seeds.

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Keywords: Antioxidant, DPPH, FRAP, Mahaleb, Total Phenolic

P-206

SYNTHESIS OF A NEW CHIRAL NORBORNADIENE INDA(BOX) LIGAND AND ITS USE IN THE COPPER (II) CATALYZED ENANTIOSELECTIVE HENRY REACTION

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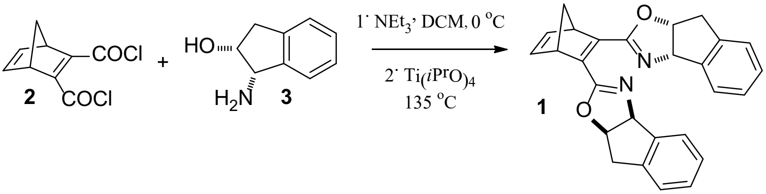
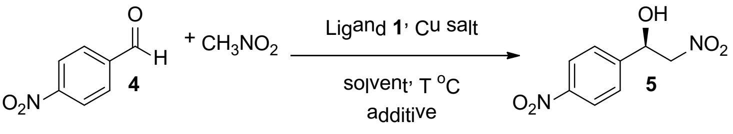
In recent years, chiral bisoxazoline-metal complexes have proven to be versatile chiral catalysts able to catalyze a wide range of reactions. The short and efficient synthesis of bisoxazoline ligands, the flexibility in ligand design, coordination to a large number of transition metals and excellent enantioselectivity in many reactions make these ligands indispensable in asymmetric catalysis [1].

In this study, new chiral inda(box) ligand **1** with a norbornadiene backbone was synthesized and used as a chiral ligand in the metal-catalyzed enantioselective Henry reaction, one of the important C–C bond forming reactions in organic chemistry [2-3]. The synthesis of the ligand was achieved in 2 steps starting from diacyl chloride **2** and (1*R*,2*S*)-*cis*-1-amino-2-indanol (**3**). The formed bis(hydroxyamide) was cyclized in the presence of Ti(*i*PrO)$_4$ at 135 ˚C to give inda(box) ligand **1** (Scheme 1) in 75% yield.



Scheme 1: The preparation of chiral inda(box) ligand **1**.

Then, the reactivity and selectivity of chiral inda(box) ligand **1** in the asymmetric Henry reaction was investigated. The reaction between *p*-nitrobenzaldehyde and nitromethane in the presence of 6 mol% of ligand **1** and 5 mol% of Cu salt was chosen as the model system [3] (Scheme 2). Optimization of the reaction conditions were achieved by testing different copper salts, solvents, amounts of catalyst, additives and various temperatures. Finally, under the optimized reaction conditions enantioselective Henry reactions were performed by using different aliphatic and aromatic aldehydes.



Scheme 2: Asymmetric Henry reaction between *p*-nitrobenzaldehyde and nitromethane.

Acknowledgements: This work was supported by Ahi Evran University (Project Number: PYO-FEN.4001/14.001) and TUBITAK (Project Number: 110T856).

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Keywords: asymmetric synthesis, Henry reaction, chiral catalyst, inda(box) ligand, copper

P-208

SYNTHESIS OF NEW GENERATION CALCIUM SILICATE BIOCERAMIC MATERIALS

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Calcium silicate materials are bioceramic materials that draw great attention from researchers because they can integrate with bone tissue through organic bonds. The sol-gel method is commonly used to produce calcium silicate materials. In the sol-gel method, an acid, a base and ethyl alcohol are used to catalyze the initiators. However, the use of acid, base and organic solvents are to be avoided when considering green-chemistry issues. In this study, calcium silicate bioceramic materials were synthesized by using the hydrothermal method. Calcium nitrate $Ca(NO_3)_2$ and tetraethyl orthosilicate (TEOS) were used as a calcium and silicium source. The synthesis was carried out with mole ratios of Ca/Si of 0.67, 1.0 and 1.5. Furthermore, for comparison, calcium silicate bioceramic materials were also synthesized using the sol-gel method with the same mole ratios of Ca/Si. Calcium silicate materials produced by both methods were sintered at 800°C for 2 h. The effects of the synthesis parameters on the crystal structures and functional groups of calcium silicate bioceramic materials were investigated using X-Ray Diffraction (XRD) and Fourier Transform Infrared (FTIR) Spectroscopy techniques. It was observed that calcium silicate materials synthesized by the hydrothermal method had similar crystal phases and functional groups with those synthesized using the sol-gel method. Moreover, XRD and FTIR results indicated that the initiators are more dependent on the Ca/Si ratio than the preparation technique of the product composition and that the hydrothermal method can be used as an alternative to the sol-gel method for the synthesis of calcium silicate bioceramic materials.

Acknowledgements: The Scientific & Technological Research Council of Turkey (TUBİTAK) for BİDEP 2209A (Proje No: 1919B011501496) are gratefully acknowledged.

Keywords: Calcium silicate, synthesis, hydrothermal, sol-gel

P-209

SYNTHESIS AND CHARACTERIZATION OF BIO-BASED POLYESTER POLYOL

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Polyester polyols based on aliphatic and aromatic dicarboxylic acids are one of the most important materials in polymer technologies [1]. Large volume of plants oils are used as renewable resources to produce various chemicals which are industrially important to make soaps, cosmetic products, surfactants, lubricants, diluents, plasticizers, inks, agrochemicals, composite materials, food industry [2]. Vegetable oils are one of the most important renewable resources in the chemical industry due to their biodegradability, availability, low cost price, environmental acceptance, renewability and non-toxic nature [3]. The epoxide ring-opening reaction is a commonly used method for the functionalization of vegetable oils. Epoxidation of vegetable oils is an industrial process, mature, controlled, and little expensive [4].

In this tudy, the polyester polyols were obtained by the polycondensation reactions between dicarboxylic acids and diols. Synthesis of bio-based polyester polyol was carried out in a round bottom flask equipped with a cooler and a mechanical stirrer. Bio-based polyester polyol was synthesized between epoxidized soybean oil and lactic acid. Polyester polyols were characterized by using titration and GPC (RI refractive index detector).

Acknowledgements: This study has been supported from Yalova University (Project No: 2016/YL/70).

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Keywords: polyester polyol, biodegradation, renewable resources, vegetable oil

P-211

GREEN SYNTHESIS OF NEW AMINO ACID SCHIFF BASES AND THEIR BIOLOGIC ACTIVITIES

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Microwave assisted synthesis, a green chemistry approach, is now a day widely performed in the laboratories. In this regard, various green strategies have been developed. One of the areas for achieving this purpose is to explore alternative reaction conditions and reaction media to accomplish the desired chemical transformation with minimized by-products or waste as well as eliminating the use of conventional organic solvents. Microwave reactions under solvent-free conditions are attractive in offering pollution free reaction, low cost, shorter reaction time and high yields together with simplicity in processing and handling [1,2].

In the present study, novel Schiff bases derived from fluorene-2-carboxaldehyde or terephthalaldehyde and 2-phenylglycine methyl ester have been synthesized by three different methods as using conventional solvent, solvent-free and natural bentonite catalyst under microwave irradiation (Figure 1). A comparative study between conventional heating and microwave irradiation has also been reported. The new compounds were characterized by IR, ^{1}H-NMR, LC-MS and electronic spectral studies. A number of biochemical and free radical scavening activity tests were performed to determine the antioxidant properties of the new compounds.

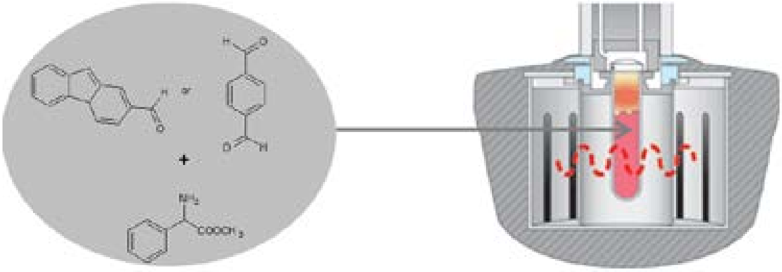

*Figure 1 :*The synthesized molecule structures and shematic microwave synthesis

Based on these results, with the help of microwave synthesis, the yield of product was increased from 50% upto 95% as compared to conventional method. By microwave, reactions were completed within 2-10 minutes and the products were obtained in good to high yields, with reduced time, waste, and formation byproduct. Several positive correlations were observed among the different antioxidant parameters.

Acknowledgements: This study was supported by the Research Fund of the Yildiz Technical University (Project number: 2013-01-02-GEP01).

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Keywords: Green Chemistry, Schiff Bases, Amino Acid

P-212

N-(*BIS*(2,4-DIMETHOXYBENZYL)CARBAMOTHIOYL)-4-METHOXYBENZAMIDE LIGAND AND IT'S PT(II)/ PD(II) METAL COMPLEXES: SYNTHESIS, CHARACTERIZATION AND ANTIMICROBIAL ACTIVITY

Ummuhan Solmaz [1], Ebru Uvacin [2], Ali Nail Selcik [2], Suleyman Bozkurt [2], İlkay Gumus [1], Emrah Aslantatar [1], Gun Binzet [3], Aylin Dogen [4], Birdal Arslan [1] and Hakan Arslan [1]

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Bis-[N-(*bi*s(2,4-dimethoxybenzyl)carbamothioyl)-4-chlorobenzamide-κO,S] platinum(II and *bis*-[*N*--(*bis*(2,4-dimethoxybenzyl)carbamothioyl)-4-chlorobenzamide-κO,S]) palladium(II) complexes were formed from the reaction between K_2MCl_4 (M:Pt and Pd) and *N*-(*bis*(2,4-dimethoxybenzyl)carbamothioyl)-4-chlorobenzamide in ethanole, respectively [1]. The title ligand and it's Pt(II) and Pd(II) metal complexes were characterized by elemental analyses, FT-IR and ^{1}H NMR, ^{13}C NMR, COSY and HMQC techniques. In addition, the synthesized compounds was evaluated for both their *in-vitro* antibacterial and antifungal activity.The findings have been reported, explained and compared with fluconazole and ampicillin used as reference drugs.

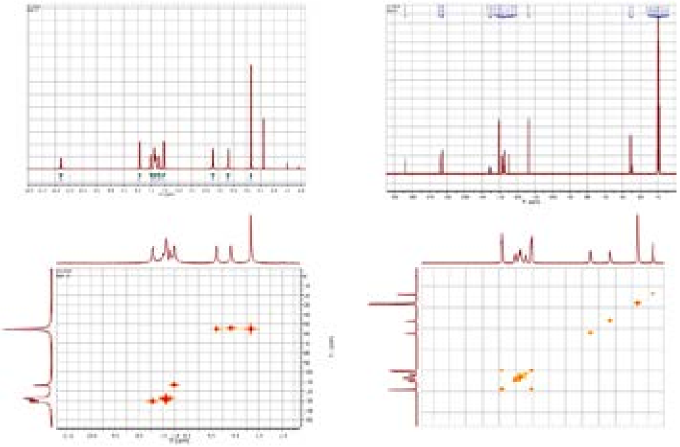

Figure 1. NMR spectra of N-(*bis*(2,4-dimethoxybenzyl)carbamothioyl)-4-chlorobenzamide.

Acknowledgements: This study was supported by the Research Fund of Mersin University in Turkey with Project Number: 2015-AP4-1162.

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Keywords: Antimicrobial activity, Benzoylthiourea, Pt(II) and Pd(II) complex

P-213

NEW BISMUTH(III) HALIDE COMPLEXES WITH 5-METOXY-2-MERCAPTOBENZIMIDAZOLE: SYNTHESIS AND STRUCTURAL CHARACTERIZATION

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Coordination compounds of thioamides and its derivatives have attracted the attention of many researchers in the past several years relating to their diverse crystal structures and physicochemical properties. Thioamides can be used as a corrosion inhibitor because of its good coordination ability with metal atoms to prevent them from direct corrosion by acids [1]. The interest for much of the research into the coordination chemistry of heterocyclic thione donors stems from their wide ranging applications such as in Medical–Biological Systems. Thioamides such as 6-mercapto-purine, on the other hand, show antitumor activity in their own right [2]. Carcinostatic activity among heavy metal complexes has been reported. More recently a platinum–pyridine thi- one complex has been patented for clinical use in cancer treatment [3-4]. Fungicidal activity has also been reported [5]. Bacteriostatic activity has been related to coordinating ability of a series of imidazoline and thiazoline-thiones. Also, thioamides based organometallic compounds are employed as precursors in preparing metal sulphide thin films [6] which have wide applications in optoelectronic devices, such as window layers for solar cells [7]. In the area of analytical chemistry, thioamide organometallic derivatives have been adopted to develop different anion-selective electrodes [8]. Attributed to the potential applications in laser technology, optical devices, etc., the study on the structures and functional properties of thioamide-based compounds represents one of the current interests in the field of semi-organic materials [9].

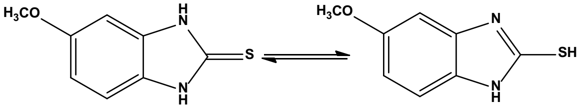

Figure 1: Tautomeric form of 5-metoxy-2-mercaptobenzimidazole

In this study, we report the synthesis and spectroscopic characterization of new bismuth (III) halide complexes (BiX_3: X: Cl and Br) with 5-metoxy-2-mercaptobenzimidazole (MtMBZIM) (Scheme 1). The complexes were characterized by their melting point, elemental analysis, FT-IR spectroscopy, FT-Raman spectroscopy, ^{1}H and ^{13}C NMR spectroscopy and Thermal Gravimetry- Differential Thermal Analysis (TG-DTA).

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Keywords: bismuth, 5-methoxy-2-mercaptobenzimidazole, characterization

P-214

DIPODAL LIGANDS WITH QUINOLINE AND PHENOL ENDED

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Quinoline, a hetero ring compound such as a pyridine ring fused to a benzene ring. So that they are also called benzo pyridine. The most important quinoline and isoquinoline is similar to naphthalene. Only the C-1 or C-2 wherein N changed instead of CH [1].

Chemocensor design and development of high selectivity and sensitivity is under active investigation in recent years which has huge implications for human health and the environment can detect anions and cations chemosens are chemists, biologists, environmental scientists, such as clinical biochemist and has attracted the attention of many disciplines. Because of that, a number of cations and anions can be used as the sensor is of considerable importance for the synthesis of new organic compounds [2].

In this study, compounds containing quinoline can be used as molecular probe in the identification of metal ions was synthesized. İlluminated structures and spectroscopic properties of these compounds have been studied. Characterization of the compound H-NMR, FTIR was performed by spectroscopic methods.

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Keywords: Dipodal Ligand, Quinoline, Censor

P-215

PREPARATION OF ALKNYL SUBSTITUTED ZINC PHTALOCYANINES SUITABLE FOR PERIODIC MESOPOROUS ORGANOSILICA NANOPARTICLES IN PDT

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Nanomedicine is the medical application for diagnosis and treatment of different human diseases with the use of nanoparticles, which are small particles with size of 1-100 nm [1]. Using nanoparticles for drug delivery has many advantages, like large-surface-to volume ratio resulting enhanced interaction sites, surface functionalization for targeting, suitable encapsulation, release of drugs in a controlled manner and more efficient uptake by cells.

Photodynamic therapy (PDT) is an emerging method for cancer therapy, which destroys tumour tissues with singlet oxygen generated upon irradiation of a photosensitizer molecule. With the design of third generation of photosensitizers, many additional properties combined with photosensitizers like imaging or selective cancer therapy [2].

Because of their defective vascular system, nanoparticles can easily enter tumour tissues. Nanoparticles also have higher retention rate than smaller molecules in tumour cells. This effect is called "Enhanced Permeability and Retention Effect" (EPR), and can be used to for selective cancer therapy [3].

Lately, Periodic Mesoporous Organosilica Nanoparticles (nanoPMOs) have gained great interest in nanomedicine [4]. These structures can be produced by cross-linking silylated organic fragments using click chemistry and can be used to encapsulate other molecules. Their versatility and biocompatibility of these structures makes them particularly interesting [5].

In this study, Zn(II) phthalocyanines bearing alkyne groups in peripheral and non-peripheral positions for further click reactions will be synthesized, to be used as a building block for nanoPMOs.

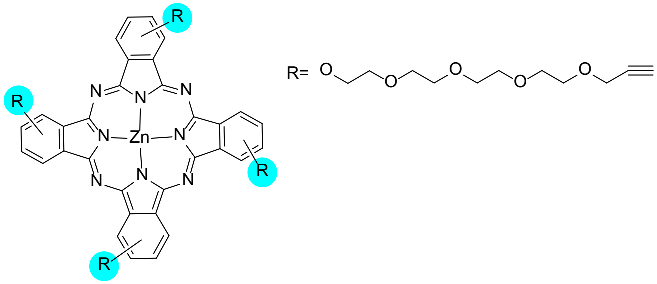

Figure 1: Peripheral and non-peripheral of Zn(II) phthalocyanines

Acknowledgements: The Scientific and Technological Research Council of Turkey (TUBITAK) is gratefully acknowledged (France-Turkey Bilateral PIA-Bosphorus 115Z864).

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Keywords: Click Chemistry, NanoPMO, Photodynamic therapy, Phthalocyanine.

P-216

TRIPLE-BOND SUBSTITUTED PHTHALOCYANINES FOR THE PREPARATION OF PERIODIC MESOPOROUS ORGANOSILICA NANOPARTICLES FOR PHOTODYNAMIC THERAPY

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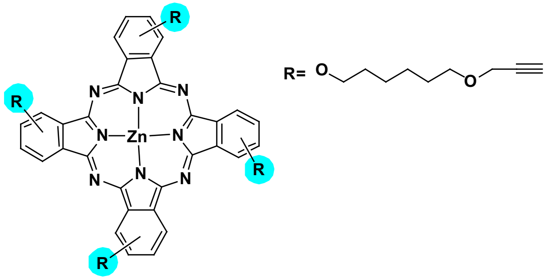
Treatment of cancer is one of the hottest topics of research for our time. There are number of different ways to approach the problem one of which is through Nanotechnologies,specifically Nanomedicine. Nanoparticles are being used in drug delivery systems thanks to their multiple advantages such as but not limited to: the ease of manipulation of size and surface characteristics which could be used for both passive or active drug targeting, controlled and sustain release during transportation as well as the location of the release, choosing an appropriate matrix and alteration of distribution in order to clear from the body help to increase therapeutic efficacy and to decrease possible side effects, various routes of administration. Among nanoparticles, especially Periodic Mesoporous Organosilica ones (nanoPMOs) proved to be of high interest due to their remarkable biocompatibility and versatility. They can be formed by cross-linking silylated organic molecules (prepared by click chemistry) and can be further functionalized or even used for encapsulating other drugs[2].

Tumor neovasculature is known for its particular high permeability or leaky nature, which can be exploited to carry and spread the nanoparticles in the cancer tissue. This is known as Enhanced Permeation and Retention (EPR) effect[1]. Multi-functionalized nanoPMOs with therapeutically active side groups and/or targeting units combined with the EPR allows us to target exactly where we want. PDTs are based on the conversion of O_2 into their toxic singlet radicals by applying appropriate wavelengths thus irradiating the photosensitizer. Technique has proven to be effective against cancer[3] and 3rd-generation of photosensitizers are being researched to combine their properties with imaging, targeting, photodynamic action, non-toxic versions, specific excitation in the therapeutic window, synergic combinations with other therapeutics or two-photon excitation. Phthalocyanines have huge advantages compared to the existing photosensitizers. Their longer wavelength adsorptions are at longer wavelengths, having extraordinary stability and superior aggregation tendency allow us better imaging and two-photon excitation.

We will report the synthesis of zinc phthalocyanines bearing alkyne groups in peripheral and non-peripheral positions to be used as building building block for preparation of nanoPMOs.



Acknowledgment: The Scientific and Technological Research Council of Turkey (TUBITAK) is gratefully acknowledged (France-Turkey Bilateral PIA-Bosphorus 115Z864).

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Keywords: Mesoporous organosilica, photodynamic therapy, phthalocyanine

P-217

SYNTHESIS AND APPLICATIONS OF NEW TYPE UREA DERIVATIVE ION SENSORS

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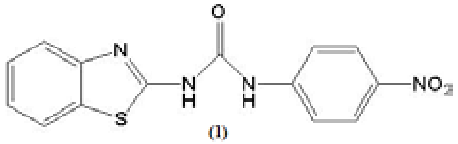
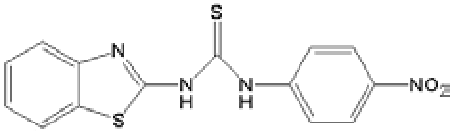
Today as a result of negative effects of industrialization on the environment, anion and cation content in water resources is increasing. For the purpose of making quantitative determination of ionic species visually identified the development of optical sensors has become a topic of interest.[1] The determination of anions from ionic species by sensors is very important in terms of supramoleculer chemistry [2,3] Since urea and thiourea derivative compounds easily interact with anions thanks to partially acidic NH protons, there have been so many studies on the synthesis and sensor properties of these compounds [4]. In this study the urea and thiourea derivative compounds (1) and (2) were synthesized as a result of the reactions of 2-Aminobenzothiozol with 4-Nitrophenyl isocyanate and 4-Nitrophenyl isothiocyanate compounds (Figure 1). The structure of compounds were characterized using FT-IR,NMR and MS techniques.

In addition to these , it was determined that the compounds behave as colorimetric and spectrophotometric sensors against fluorid, cyanide and acetate anions. The sensor properties of compounds against anions were closely examined using UV-vis spectrophotometer.



(1)



(2)

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Keywords: 2-Aminobenzotiyozol,urea, thıourea

P-218

SYNTHESIS AND CHARACTERIZATION OF Zn(II), Ni(II), Mn(III) COMPLEXES OF DIIMINE LIGAND DERIVED FROM 2-HYDROXY-1-NAPHTHALDEHYDE AND 3-METHOXYSALAICYLALDEHYDE

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Schiff bases are a good series of ligands capable of binding metal ions leading to metal complexes with interesting properties. Salen complexes of transition metals have been used in solution as biomimetic catalysts for oxygen atom transfer, and as catalysts for enantioselective epoxidation, aziridinations, mediating organic redox reactions and other oxidative processes [1,2]. Several metal chelates of the ONNO donor class of Schiff bases were studied as oxygen carrier and they were found to be useful models for bioinorganic processes. Schiff bases are effective inhibitors and could be adsorbed on the surface of metals. Asymmetric tetradentate Schiff base complexes have been extensively used as macrocycle models. These compounds have received considerable attention because of their potential use as catalysts, and their antibacterial, antifungal, antitumour and herbicidal activities [3].

In the first step of our study, ONN donor monoimine ligand, 2-hydroxy-1-naphtylidene-3,4-diaminobenzophenone (NADAB), was obtained by the reaction of 3,4-diaminobenzophenone with 2-hydroxy-1-naphthaldehyde in the methanol medium according to the methods reported previously [4]. Then, asymmetric diimine ligand (L; ONNO donor) was obtained from the reaction of 3-methoxysalicylaldehyde and NADAB. In the second step, metal complexes of L was synthesized by using Zn(II), Ni(II) and Mn(III) metal salts. The structure of the whole obtained compounds were characterized by elemental analysis, IR, ^{1}H-NMR, UV-Visible and ESI-Mass techniques.

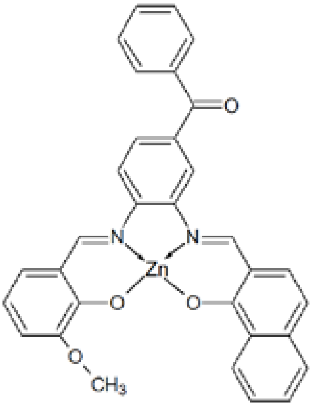

Figure 1: Molecular structure of Zn(II) complex.

References:

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Keywords: Diimine ligand, metal complex, ONNO donor ligands

P-219

NAPHTHALIMIDE SUBSTITUTED PHTHALOCYANINES: SYNTHESIS, PHOTOPHYSICAL AND PHOTOCHEMICAL PROPERTIES

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Singlet oxygen ($^1O_2$) has great importance in many biological and chemical processes such as photodynamic therapy (PDT), the sterilization of donor blood and purifying sewage waters of phenols and sulfur and phosphorus containing compounds [1]. PDT which is main application of singlet oxygen is a minimally-invasive procedure that has been clinically approved for treating certain types of cancers [2]. Phthalocyanines (Pcs) are widely used in PDT since they have fluorescence emission in the far red spectral region, demonstrate high intersystem crossing (ISC) to the first excited triplet state and a high efficiency of singlet oxygen generation [3]. The rich photophysical properties of NIs (which are highly dependent on the nature and the substitution pattern of the aryl ring) make them prime candidates as probes as the changes in spectroscopic properties such as absorption, dichroism, and their fluorescence can all be used to monitor their binding to biomolecules [4].

In this work, 2-[2-(4-Hydroxyphenyl)ethyl]-1H-benz[de]isoquinoline-1,3(2H)-dione substituted Zn(II) (**1**) and Ga(III) (**2**) Pcs were designed/synthesized, and their photophysical and photochemical properties as well as singlet oxygen generations were investigated in DMSO and 1-Butyl-3-methylimidazolium hexafluorophosphate ([EMIM]PF_6). Singlet oxygen quantum yields (Φ_Δ) were determined as 0.75 for **1** and 0.72 for **2** in DMSO and 0.57 for **2** in [EMIM]PF_6. To the best of our knowledge, these novel dyes are the first examples of the symmetric phthalocyanine-naphthalimide combination, and the influence of naphthaimide substitution on photophysical and photochemical properties have not been studied so far. Our findings indicated that **1** and **2** can be promising candidates as photosensitizers for PDT with high singlet oxygen generations.

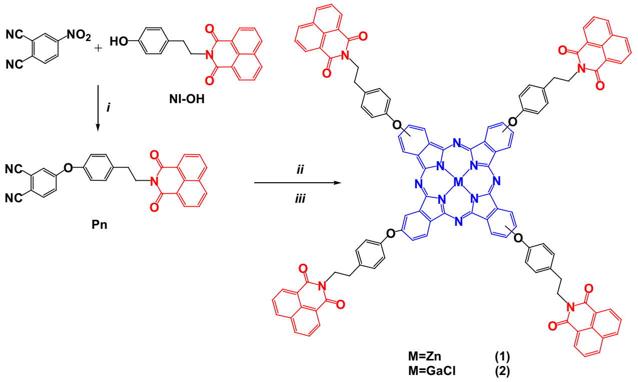

Figure 1: Synthesis of naphthalimide substituted Zn(II) and Ga(III) phthalocyanine derivatives. ***i***: DMF, K_2CO_3, r.t., 24 h; ***ii***: Zn$(OAc)_2$, DBU, n-hexanol, reflux, 5 h; ***iii***: 1. Li, n-pentanol, reflux, 5 h; 2. acetic acid; 3. Ga(III)Cl_3, quinoline, 150°C, 5 h.

References:

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Keywords: phthalocyanine, 1,8-naphthalimide, singlet oxygen generation, ionic liquids

P-220

SYNTHESIS 4,5-DIIODOPHTHALONITRILE AND 3,4-DIIODOPHTHALONITRILE: TOWARDS TO SYNTHESIS NEW TYPE PHTHALOCYANINES

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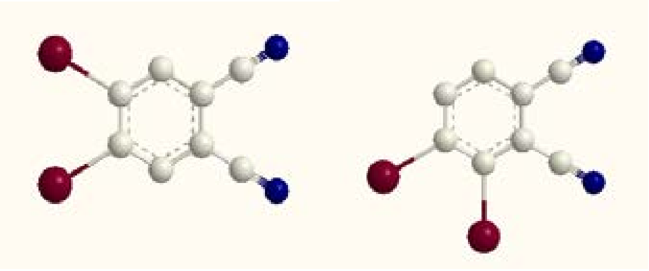
Phthalonitrile is an organic compound with the formula $C_6H_4(CN)_2$, which is an off-white crystal solid at room temperature. The compound is used as a precursor to phthalocyanine other pigments, fluorescent brighteners, and photographic sensitizers. Among to phthalonitrile derivatives diiodo phthalonitriles have significant advantantage since they can be easily substituted thanks to reactive iodine groups.

In this work, we managed to synthesis and seperate 4,5-diiodophthalonitrile and 3,4-diiodophthalonitrile by column chromatography first time in literature.[1,2] The solid-state structures and geometries of compounds were determined by single-crystal X-ray structural analysis Especially 3,4-diiodophthalonitrile has a big potential as a precursor of new type phthalocyanine derivatives different from known type: peripheral and non peripheral substituted phthalocyanines.



A B

Figure 1. A: 4,5-Diiodophthalonitrile B: 3,4-Diiodophthalonitrile

References:

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Keywords: Crystal, Phthalocyanine, Phthalonitrile

P-221

SYNTHESIS AND CHARACTERIZATION OF NOVEL Zn(II) PHTHALOCYANINES

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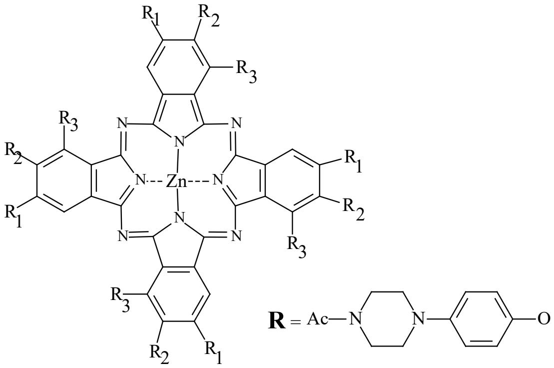
The chemistry of phthalocyanine compounds was discovery over 80 years ago. Phthalocyanines have been of wide interest, in part because of their applications as colorants, chemical sensors, electrochromic compounds, in batteries, in photodynamic therapy, as semiconductive materials and liquid crystals. Bulky substituents on the peripheral or nonperipheral enhance the solubility and the donor groups of the substituents are capable of binding to additional metal ions [1].



	R1	R2	R3
1	R	H	H
2	R	R	H
3	H	H	R

Figure 1: Novel Zn(II) Phthalocyanines

In this work, compounds 4-(4-(4-acetylpiperazin-1-yl)phenoxy)phthalonitrile, 3-(4-(4-acetylpiperazin-1-yl)phenoxy)phthalonitrile and 4,5-bis-(4-(4-acetylpiperazin-1-yl)phenoxy)phthalonitrile were firstly prepared and Zn(II) Phthalocyanines were synthesized by the treatment of dinitrile derivatives with anhydrous $Zn(CH_3COO)_2$. Structures of all compounds were determined by elemental analyses, Uv/vis, ^{1}H-NMR, ^{13}C-NMR, Fluorescence and IR spectroscopy.

Acknowledgements: This work was supported by the research fund of the Amasya University (FMP-BAP 15-0157)

References:

[1] Leznoff, C.C.; Lever, A.B.P. *Phthalocyanines: Properties and Applications, eds.* VCH,Weinheim, **1989**, Vol. 1; **1993**, vol. 2.

Keywords: Phthalocyanine, Phthalonitrile, 1-(4-(4-hydroxyphenyl)piperazin-1-yl)ethanone

P-222

THE SYNTHESIS OF SELECTIVE MERCURY(II) ION FLUORESCENCE SENSORS BASED ON PHOSPHAZENE CORE

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Mercury(II) which is one of the most toxic heavy metal ion is significant threat to human health and environment owing to its application areas, prevalence, tend to accumulate in metabolism which shows highly toxic effect even very low amounts in living organisms. Generally, concentration levels of mercury(II) ions are mg/L, µg/L in this media and complexity of this media and the analysis of the mercury(II) ion is difficult due to complexity of this media.

Past two decades, research and developments, financial investment, scientific publications and active researchers, etc. about fluorescence sensors are getting increase. Using optical methods for chemical analysis are very important in sensor area. Optical sensors have been great interest in environmental monitoring, clinical investigations and control of industrial processes [1]. When compare fluorescence sensors with instrumental methods, fluorescence sensors have great advantage such as high selectivity, sensitivity, instant monitoring, low cost and possibility for miniaturization and great flexibility [2].

In this study, the design, synthesis and investigation of properties of new compound which can be used as selective and sensitive fluorescence sensor for mercury(II) ions were planned. Thus, the disadvantages like low detection limits, low sensitivity, high cost and not allowing real-time detection which appear other determination methods thought be discarded by means of novel pyrene substituted cyclic phosphazene chemosensor. The novel compound was fully characterized by the standard spectroscopic techniques such as ^{1}H, ^{13}C and ^{31}P NMR, mass spectrometry (MALDI-TOF) and elemental analysis as well. The chemosensor behavior of this pyrene substituted cyclic phosphazene compound against to mercury(II) ions was determined by fluorescence spectrophotometry.

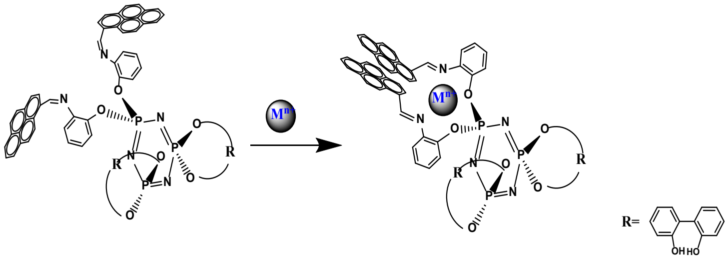

Figure 1: The structure of the pyrene substituted cyclic phosphazene chemosensor.

Acknowledgements: This work was supported by the Scientific and Technological Research Council of Turkey (TUBITAK), Project Number 214Z069.

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Keywords: cyclic phosphazene,fluorescence sensor,mercury,pyrene

P-223

HYDROLYSIS OF HEMICELLULOSIC STRUCTURE IN LIGNOCELLULOSIC BIOMASS USING RECOMBINANT L-ARABINOFURANOSIDASE

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There are various types of agricultural wastes in Turkey and the amount of the produced waste is approximately 50 million tons. However, these resources can not be utilize sufficiently. Agricultural wastes are usually put away in the fields or they are lit right postharvest. Agricultural wastes contain lignocellulosic structure and their basic compounds are polymeric carbohydrates (cellulose and hemicellulose) and lignin [1, 2]. The importance of lignocellulosic enzymes are clearly understood because of their roles in many industrial and biotechnological processes. This case has provided starting of new period which enable to more effective utilization of cheap agricultural wastes. Interest in the α-L-arabinofuranosidases (E.C 3.2.1.55) which have a synergetic effect with other lignocellulosic enzymes increase with each passing day and this enzyme is used successfully in many industrial processes. In this study, hydrolysis of hemicellulosic structure in lignocellulosic biomass using recombinant L-arabinofuranosidase has been purposed. For this purpose; first, the waste type which best affected by the enzyme was determined and then optimization studies were performed with this waste type. Optimum values were obtained as; pH was 5.0, buffer concentration was 50 mM, incubation temperature was 35°C, enzyme concentration was 25 µM, shaking rate was 200 rpm and the incubation time was 18 hours. HPLC and FT-IR analyzes of raw material and samples which hydrolyzed at optimum conditions, were performed and actualization of hydrolysis has been proved. As a result, hydrolysis of agricultural waste by recombinant N-arabinofuranosidase was performed effectively without any pre-treatment. The study has been completed successfully.

Acknowledgements: This study was supported by TÜBİTAK 1001 (Project Number: 214Z086) Scientific and Technological Research Projects Supporting Program.

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Keywords: L-arabinofuranosidase, recombinant protein, enzyme biotechnology, hydrolysis of agricultural waste.

P-224

BIOCHEMICAL CHARACTERIZATION OF RECOMBINANT N-ARABINOFURANOSIDASE

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Enzymes are successfully used in many of the industrial process, such as food and paper industries. Enzymes, which are derived from microorganisms living under mild conditions, are not suited for industrial processes that require high temperature, acidic or basic reaction conditions. Enzymes, which are derived from microorganisms living under extreme conditions are needed for these industrial hard conditions [1-3]. α-N-arabinofuranosidases (E.C 3.2.1.55) belong to group of glycoside hydrolysis. This enzyme group hydrolyses 1,3 and 1,5 α-arabinosyl bounds of N-arabinose containing molecules. It is also an important part of a system which is responsible for complete hydrolysis of arabinoxylans [4]. N-arabinofuranosyl units, located in the xylan chain, inhibite enzymes which degraded xylene. Similarly, N-arabinofuranosyl units, locate in the pectin, block degradation of this polymer [5]. In this study, biochemical characterization of recombinant N-arabinofuranosidase has been purposed. For this purpose, effect of pH, temperature and mediator on enzyme activity were determined. Also the substrate specificity and the thermal stability of the enzyme was examined. Referring to the literature, it is seen that a small number of studies conducted with the enzyme. Therefore, this study will contribute to the literature. *Alicyclobacillus acidocaldarius* (DSM 446), which was the source of recombinant N-arabinofuranosidase, is acidothermophilic bacteria. As a result of characterization studies, it was determineted that the enzyme kept its activity at high temperatures. The results are promising in terms of industrial applicability of this enzyme.

Acknowledgements: This study was supported by TÜBİTAK 1001 (Project Number: 214Z086) Scientific and Technological Research Projects Supporting Program.

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Keywords: N-arabinofuranosidase, recombinant protein, enzyme characterization, *Alicyclobacillus acidocaldarius* (DSM 446).

P-225

DEGRADATION OF BURDIRECT RED BY *PSEUDOMONAS PUTIDA* (ATCC 17514)

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In the textile industry, large quantity of various dyes are discharged to the receiving environment duration of production process. Thereby, several problems are occurs for environmental and human health. Biological methods are generally considered environmentally friendly, as they can lead to complete mineralization of organic pollutants at low cost [1]. In this study, Burdirect Red was biodegraded by *Pseudomonas putida* (ATCC 17514) has been purposed. For this purpose, optimization studies for microbial degradation were performed and optimum conditions were determined. The optimum degradation medium was designed for *P. putida* (ATCC 17514) to effective degradation of Burdirect Red. Also, temperature, mixing speed and time parameters were optimized for microbial degradation. ATR-FTIR and GC-MS analyses of sample, was degraded at optimum conditions, were performed. Consequently, the microbial degradation was performed successfully. In terms of application, if the reaction conditions are provided by textile fabrics this method can be apply easily. In this study, one dye degradation was optimized. If optimization studies performed with different dyes, positive results can be obtained.

Acknowledgements: This study was supported by TÜBİTAK 1001 (Project Number: 214Z086) Scientific and Technological Research Projects Supporting Program.

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Keywords: Burdirect red, dye degradation, environment biotechnology.

P-226

DEVELOPMENT OF A NEW ANTIBACTERIAL BIOMATERIAL

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Discovery and use of antimicrobial agents contributed to treat infectious diseases. But in recent years, many antibiotics which have effected some bacteria species lost their activity. Accumulation of mutations in bacteria and use of antibiotics often and sometimes unnecessary caused antibacterial resistance. That's why, antimicrobial agents are needed to be developed. Recently, peptide groups with antimicrobial effect are discovered and they mostly effected Gram positive bacteria. Identification of those natural products are important to manufacture new products with a potential for medical use and prevent infectious diseases. Antimicrobial peptides are a part of natural immune system and they have antimicrobial property. These peptides are mostly cationic and they could be isolated from many organisms such as fungi, bacteria, plants, animal etc. Because of their mode of action, they are suitable to immobilize on materials [1, 2]. The aim of this study was to immobilize of nisin to alginate and improve an antibacterial biomaterial. For this purpose, calcium-alginate beads were formed by dropping to calcium-chloride solution and nisin was immobilized to beads by using 1-Ethyl-3-(3-dimethylaminopropyl) carbodiimide (EDC) at optimum conditions. After immobilization, actualization of immobilization was investigated by analyzing ATR-FTIR spectrum and SEM images. Also, antibacterial property of obtained product was tested. Spread plate technique was used in antibacterial test process. Improved biomaterial can be converted to gel form because of complication between calcium, presented in alginate, and some chemical such as EDTA and citrate. After gel formed was obtained, it can be applied some materials and thereby a composite material can be developed. Improved product has potential for open wound, surgical drapes, bed and pillow sheath in hospital and it may also be used for increasing human comfort in daily life.

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Keywords: Nisin, alginate, biomaterials, antimicrobial peptides, immobilization of biomolecules.

P-227

MICROBIAL DEGRADATION OF SOME TEXTILE DYES

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The control of water pollution has become of increasing importance in recent years. The discharge of dyes into the receiving waters constitutes only a small portion of water pollution. However, the presence of very low concentrations of dyes in receiving waters is aesthetically undesirable. Therefore, treatment processes removing dyes from textile effluents have become important in order to conserve receiving waters. Nowadays, removal of dyes is carried out generally by physical and chemical methods. These methods are often very costly and accumulation of concentrated sludge creates disposal problems. For this reason, there is a need for alternative treatment methods, such as biological treatment which is efficient and economical in removing dyes from large volumes of effluents [1, 2]. In this study, microbial degradation of Burdirect Orange, Burirect Red, Burdirekt Black Meta Konz, Burdirekt Green, Burdirekt Dark Blue dyes with *Pseudomonas putida* (ATCC 17514) has been purposed. For this purpose, first, dye which was more degraded than other dyes, was chosen and optimization of microbial degradation was performed. Result of ATR-FTIR and GC-MS analyses of sample, which was degraded optimum condition, no metabolite was detected. As a result, degradation of Burdirekt Black Meta Konz with *P. putida* (ATCC 17514) has been completed successfully.

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Keywords: Burdirekt Black Meta Konz, environmental biotechnology, removal of dyes, textile dyes.

P-228

CASEIN IMMOBILIZATION TO ENZYMATIC MODIFIED POLYACRYLONITRILE FABRIC

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Polyacrylonitrile (PAN) fabric, one of the synthetic polymers most widely used, have undesirable properties such as less flexibility, prone to static charges, low water holding capacity and low dyeing properties. These undesirable characteristics can be improved by modification. Therefore, recent years, number of studies on modifications of this fabric has been increased [1]. In this study, casein immobilization to enzymatic modified PAN fabric was purposed. For this purpose, casein was immobilized to PAN fabric, which was modified with nitrilase, by using 1-Ethyl-3-(3-dimethylaminopropyl) carbodiimide (EDC) and reaction conditions were optimized. After optimization studies, actualization of immobilization was investigated by analyzing ATR-FTIR spectrum, contact angle measurements and SEM images of raw, enzymatic modified and casein immobilized PAN fabrics. Results of these analyses have attested to actualization of immobilization. As a result, immobilization of casein to enzymatic modified PAN fabric was performed successfully. Casein immobilized PAN fabric has been gotten more hydrophilic structure. Thereby, flexibility of PAN fabric has been increased and fabric has been gotten less wrinkling property. Also, dyeing property of PAN fabric has been increased and improvement in the touching of PAN fabric was performed.

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Keywords: Polyacrylonitrile fabric, casein, enzymatic modification, immobilization of biomolecules.

P-229

INVESTIGATION OF THE EFFECTS OF TEMPERATURE PROGRAMMING ON LUMINESCENCE PROPERTIES OF LANTONOID DOPPED BOR GLASSES

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Growing interest recently has been focused on alkaline earth borate glasses due to their applications as laser hosts phosphor lamp and other photonic devices. Borate based glasses are suitable for doping of RE ions due to their high transparency, low melting temperature, excellent thermal stability, and good RE ions solubility in them [1-5]. Heating and cooling conditions are very important to be stable and resistant structure of the glass.

In this study, two samples were prepared by using the same mixture composition. In the first study, cascade heating and cooling was applied to the one sample with temperature programming. In the second one, heating and cooling processes were executed abruptly. The boron glass product was examined how it is affected by the temperature programming. The thermal stability, structural and luminescence properties of both glasses were compared. The excitation and emission spectra of glasses are shown in the Figure 1(Fig 1a: Abruptly heating and cooling, Fig 1b: Cascade heating and cooling). It seems that the emission intensity of the glasses which prepared by cascade heating and cooling processes is better. It means that the heating and cooling program which is used during production affects the quality and physical properties of the glasses.

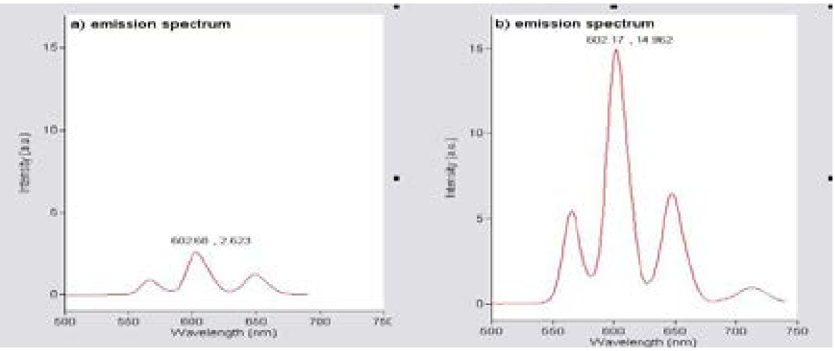

Fig 1. Luminescence measurement results

Acknowledgements: This study is supported by Mersin University Research Funding and Eti Mine Works General Directorate

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Keywords: Borate glasses, Lantonoid ions, Luminescence material

P-230

APPLICATION OF THE IMINE-GRAPHENE HYBRIDS IN THE PRECONCENTRATION STUDIES

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Graphene oxide is nano-sized carbon materials it has large surface area, electron-rich structure, nano-sheet morphology, good thermal and chemical stability. It could yield high preconcentration factor and good selectivity result from the large surface area [1]. The large surface area and its electron-rich double sided polycyclic aromatic scaffold makes it a promising analytical candidate as a wonderful adsorbent [2]. GO can be used for adsorption of organic compound, metal ions, solid-phase extract, chromatography separation and preconcentraion [3].

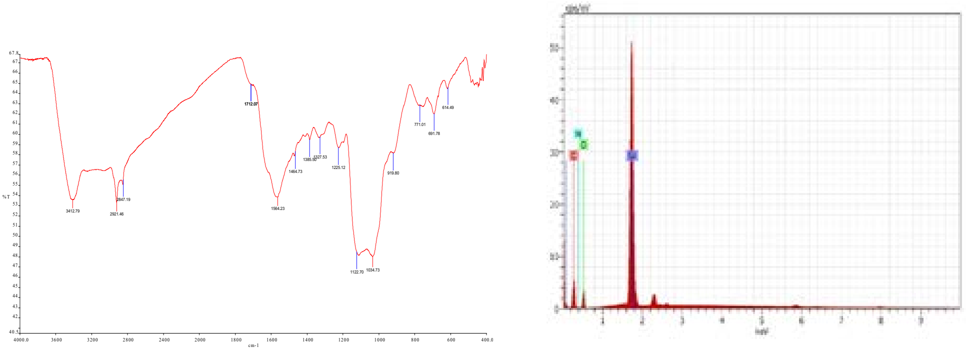

Figure. (1,2) FTIR, EDX imaging of the hybrid materials

In this work, graphite was oxidized according to hummer method forming graphene oxide. GO was then silylated using 3-(trimethoxysilyl) propylamine under proper reaction condition. finally modified GO having primary amine unit(-NH_2) was reacted with 3,5-diiodosalicyaldehyde to form GO-Schiff base material. the novel GO-Schiff base hybrid material was characterized by {FTIR(fig1), EDX(fig2), SEM, TEM, Raman, XRD, TGA, UV, ICP } methods. These new graphene hybrid materials were used for the separation of heavy metals from waste water using syringe and batch methods. Selectivity of graphene hybrid materials toward several metal ions were compared and reusability of the new materials were investigated. Potential application for the solid phase extraction of heavy metals was determined.

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Keywords: Graphene oxide, chromatography, hybrid materials

P-231

GRAPHENE BASED ON HYBRID MATERIAL DESIGN FOR THE SOLID PHASE EXTRACTION OF THE Mn(II) AND Zn(II)

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Graphene oxide (GO) is one of those materials - it is a single-atomic layered material, made by the powerful oxidation of graphite, it has large surface area and good thermal and chemical conductor . İts used in making reduced graphene oxide for electronic devices, graphene oxide has been used in catalytic oxidation[1] biotechnology and as a surfactant[2]. Graphene is also related to carbon nanomaterials such as carbon nanotubes and fullerene[3].

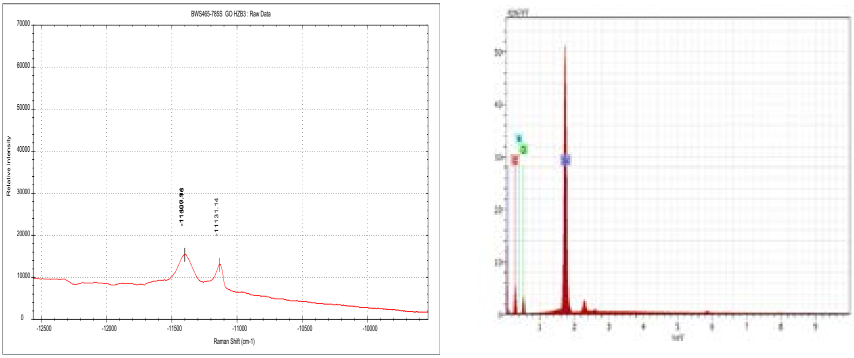

Figure. (1,2) RAMAN, EDX imaging of the hybrid materials

In this work,graphite was oxidized according to hummer method forming graphene oxide. GO was then silylated using 3-(trimethoxysilyl) propylamine under proper reaction condition. finally modified GO having primary amine unit(-NH_2) was reacted with 3,5-diiodosalicyaldehyde to form GO-Schiff base material. the novel GO-Schiff base hybrid material was characterized by {Raman(fig1) , EDX(fig2) , SEM, TEM, FTİR, XRD, TGA, UV, ICP } methods. These new graphene hybrid materials were used for the separation of heavy metals from waste water using syringe and batch methods. Selectivity of graphene hybrid materials toward several metal ions were compared and reusability of the new materials were investigated. Potential application for the solid phase extraction of heavy metals was determined.

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Keywords: Graphene oxide, solid phase extraction, heavy metals

P-232

INVESTIGATION OF THE EFFECTIVENESS IN THE SOLID PHASE EXTRACTION STUDIES OF THE GRAPHENE HYBRIDS

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Graphene is known as the newest member of the carbon family. In view of the fact that it's unique structural and physicochemical properties has fascinated to the science world since its discovery. [1] In this study, a new sorbent material having functionalized[2]for solid phase extraction (SPE) and discovered its compliance based on the removal of some heavy metal ions[3] were included by aqueous samples under the various laboratory conditions such as pH, concentration, temperature, and time effect on their adsorption capacity and reusability.

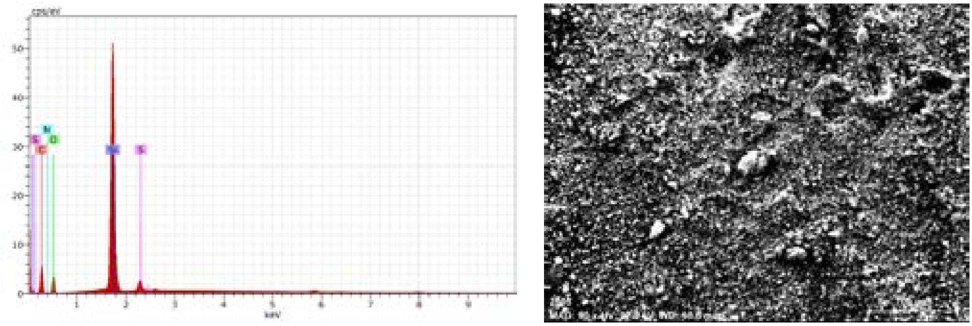

Figure.(1a , 1b) SEM and EDX imagine of the hybrid materials

In this work, firstly graphene oxide (GO) was oxidized according to Hummer method. Oxidize graphene oxide was then silanized using 3-(trimethoxysilyl) propylamine under proper reaction conditions. Finally modified graphene oxide having primary amine unit(-NH2) was reacted with 3,5-dicloro salicyldehyde to form graphene-schiff base material was characterized by EDX (Fig 1a) SEM (fig 1tb), TEM, RAMAN, IR, Uv-Vis, photolumisence, and XRD methods. These new graphene hybrid materials were the used for the separation of heavy metals from drinking and waste water using batch methods. Selectivity of graphene hybrid materials towards several metals ions were compared and reusability of the for the solid phase extraction of metals was determined .

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Keywords: Graphene Hybrids, Hummer method, batch methods

P-233

ADSORBSION BEHAVIOR OF MODIFIED NATURAL SUPPORTS: REMOVAL OF DYESTUFFS FROM TEXTILE EFFLUENTS

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Age weaving processes in textile industry consume huge amounts of water and chemicals. Textile effluents are defined as high-volume and composition of wastewater which can be subject to wide variations. Depending on the variety of organic and inorganic compounds used in both dyeing and other processes, properties of the resulting waste water are different.

Dyestuff to the receiver water source materials constitutes a small part of the organic pollution load, however, the presence of colorants in the receiving environment in very low concentrations is undesirable even in terms of aesthetics. Colored wastewaters given to the recipient water reduces the light transmission in the aquatic environment and photosynthetic activity is adversely affected. Moreover, accumulation of the dye in some aquatic organisms, the risk of occurrence of toxic and carcinogenic product brings with it. In this context, color removal processes of dyes containing textile effluents are important ecologically.

Today, dyestuffs removal is performed by substantially the physical and chemical methods. Chemical methods most commonly used for treatment of textile effluents are oxidation, chemical precipitation, flocculation and Cucurbituril method [ref]. The physical methods, can be divided into three groups as adsorption, membrane filtration and ion exchange.

In this work, it is aimed to achieve efficient adsorbents capable of both physical and chemical bonding with dyestuff via modification of natural supporting materials (zeolite, diatomite, radiolaritine). All chemicals {1-[3-(triethoxysilyl)propyl]-2-imidazoline, 3-chloropropyltrimethoxysilane, 3-(2-Aminoethylamino)propyl]trimethoxysilane } are commercial reagents and preferred to increase adsorbent ability of supporting agents. Adsorbsion ability of modified supporting materials were investigated using Uv-vis spectrophotometer to determine concentration of reactive dyes.

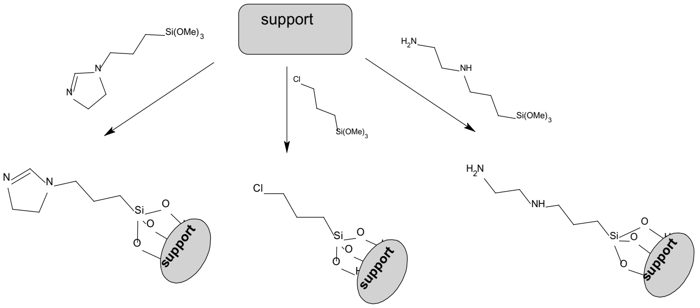

Figure 1: preparation of adsorbants

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Keywords: adsorption, modified supporting materials, reactive dye, textile effluents

P-234

EFFECT OF QUEBRACHO BARK ON THE PROPERTIES OF OPAQUE GLAZES

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In this work, the effect of quebracho bark on the physical and chemical properties of opaque glazes was investigated. Various ratios (0.25-10 wt. %) of quebracho bark were incorporated into the glazes to obtain experimental glaze recipes and melting temperatures of the glaze compositions were calculated through the fluxing factors of the oxides present in the glazes. Thereafter, the glaze compositions were fired at the calculated temperature value of 1100°C. Standard colouring analyses, resistance to impact, water absorption, firing strength, and resistance to acid and alkali tests were conducted. After establishing the Seger formulas, surface tensions of the glazes were calculated by making use of the molar surface tension factors of the oxides already present in the glaze compositions at the same sintering temperature of 1100°C. Results gathered showed that quebracho bark was a good deflocculant and increased strength, hardness and opacity of the glazes.

Keywords: Opaque glaze, quebracho bark, viscosity

P-235

PHOTOLUMINESCENT PROPERTIES OF Eu^{3+}-ACTIVATED $Sm_2Ti_2O_7$ PYROCHLORE

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Compounds with the general formula $A_2B_2O_7$ (A and B are metals) belong to a family of isostructural phases of the mineral pyrochlore. They are mainly crystalised in cubic structure with a variety of possible chemical substitutions at the A and B sites. The A element can be a rare earth metal while the B can be a transition or a post-transition metal. Therefore $A_2B_2O_7$ compounds exhibit a variety of fascinating physical properties. One of excellent property of these materials is their considerable photoluminescence characteristics. In this study, the rare-earth pyrochlore $Sm_2Ti_2O_7$ was activated by Eu^{3+} synthesized through a high temperature solid state reaction method under open atmosphere. The thermal analysis (DTA/TG) were carried out to examine phase formation and to determine possible reactions. The phase properties were characterized by X-ray powder diffraction (XRD). XRD patterns of Eu^{3+}-activated $Sm_2Ti_2O_7$ powders together with 01-072-9772 PDF card number give the cubic structure with $a=b=c=10.231$ Å and $\alpha=\beta=\gamma=90°$ lattice parameters. The photoluminescence (PL) analysis were performed to obtain excitation, emission (Figure 1) and decay time properties by using a PL spectrometer under room temperature. The PL results showed that the excitation maximum at 421 nm which is related to both $^7F_0 \rightarrow {}^5D_3$ transition of activator Eu^{3+} and $^6H_{5/2} \rightarrow (^6P,^4P)_{5/2}$ transitions of Sm^{3+} ions. The second excitation at 293 nm is due to ligand-to-Eu^{3+} charge-transfer transitions (LMCT). There are three emissions which are at 655 nm belong to both $^5D_0 \rightarrow {}^7F_3$ transitions of activator Eu^{3+} and $^4G_{5/2} \rightarrow {}^6H_{9/2}$ transitions of Sm^{3+} ions, at 704 nm (maximum) and 720 nm belong to both $^5D_0 \rightarrow {}^7F_3$ transitions of activator Eu^{3+} and $^4G_{5/2} \rightarrow {}^6H_{11/2}$ transitions of Sm^{3+} ions.

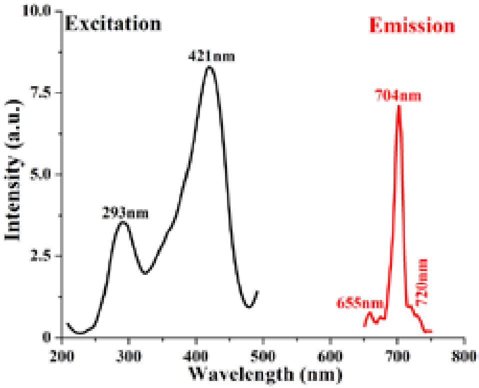

Figure 1: The excitation and emission spectrum of $Sm_{1.98}Eu_{0.02}Ti_2O_7$ phosphor.

Acknowledgements: The authors would like to thank TUBITAK (The Scientific And Technological Research Council Of Turkey) for the support to the project numbered 114Z438.

Keywords: photoluminescence, differential thermal analysis (DTA), powder diffraction.

P-236

SYNTHESIS, MODIFICATIONS AND RELEASE STUDY OF POLY (VINYL PROPIONATE-CO-MALEIC ANHYDRIDE)

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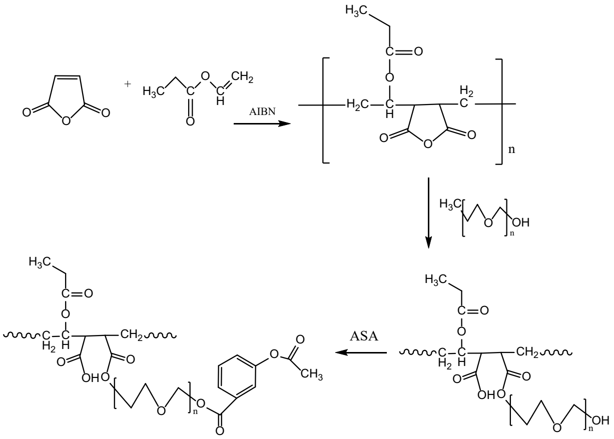
The main aim of studies in drug field for many years, has been occurred to develop a novel molecule that therapeutic various diseases. The goal in the search for alternative is to improve the quality of life as well as treatment of patients. Reduce the drug dose, prolong the dosing interval, decontamination from side and detrimental effects, even sending to the target area of the drug are for this purpose and are controlled release system that best respond to these expectations. The building blocks of many of the controlled release system are polymer and drug release velecity and period are set by the polymer. According to usage path, the purpose and properties of the drug, the system is prepared using one or more polymers[1].

In this study, copolymerization of maleic anhydride, vinyl propionate was obtained by free radical polymerization in a suitable solvent and temperature medium[2]. Synthesized polimer were modified with polyethylene glycol, and acetylsalicylic acid. Controlled release of modified polymer will be examinated in a certain temperature and pH[3].



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Keywords: Vinyl Propionate, Maleic Anhydride, Controlled Realesed

P-237

SYNTHESIS, MODIFICATION AND CONTROLLED RELEASE OF POLY(ISOBUTYLENE VINYL ETHER-CO-ITACONIC ANHYDRIDE-CO-N-ISOPROPYLACRYLAMIDE)

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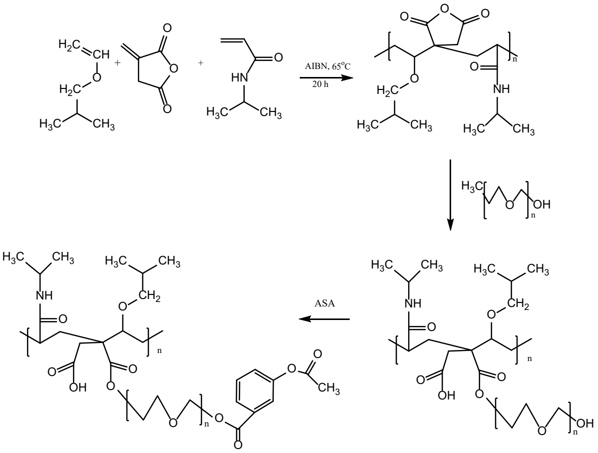
The main aim of studies in drug field for many years, has been occurred to develop a novel molecule that therapeutic various diseases. The goal in the search for alternative is to improve the quality of life as well as treatment of patients. Reduce the drug dose, prolong the dosing interval, decontamination from side and detrimental effects, even sending to the target area of the drug are for this purpose and are controlled release system that best respond to these expectations. The building blocks of many of the controlled release system are polymer and drug release velecity and period are set by the polymer. According to usage path, the purpose and properties of the drug, the system is prepared using one or more polymers[1].

In this study, copolymerization of isobutylene vinyl ether, itaconic anhydride and N-isopropylacrylamide was obtained by free radical polymerization in a suitable solvent and temperature medium[2]. Synthesized polimer were modified with polyethylene glycol, and acetylsalicylic acid. Controlled release of modified polymer will be examinated in a certain temperature and pH [3].



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Keywords: İsobutylene Vinyl Ether, İtaconic Anhydride, Controlled Released

P-238

SYNTHESIS AND CHARACTERIZATION OF CATHODE MATERIALS WHICH ARE INCLUDING STABLE-NITROXIDE RADICALS BASED ON AROMATIC SUBSTITUTIONAL POLYPHOSPHAZENE

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Existing energy systems based on the burning of fossil fuels is irreversibly. Thus interest on the renewable energy sources increased gradually due to the environmentally harmful effects and resource limitations of fossil fuels. It has become more important than ever to develop clean and renewable energy systems, such as solar cells, fuel cells, batteries. Li-ion batteries have high energy and power density. However, during high current charging or discharging, mass transfer limitations and other factors increase the cell temperature and thus the energy density and cycle life of the battery is decreased[1]. Another class of cathode materials of rechargeable lithium-ion batteries are redox-active and stable radical polymers which are alternative to inorganic metal oxide cathodes. The radical-polymer cathode lithium ion battery energy density can be increased by increasing the number of the radical on per monomer unit[2].

In this study, we aimed to synthesize and characterization of novel nitrogen-oxide radical group carrying polyphosphazenes and investigation of their potential usage in rechargeable lithium-ion battery cathode active material. For this purpose a set of radical nitrogen-oxide group carrying polyphosphazenes were prepared and the structures of the polymers were characterized with standard spectroscopic techniques.

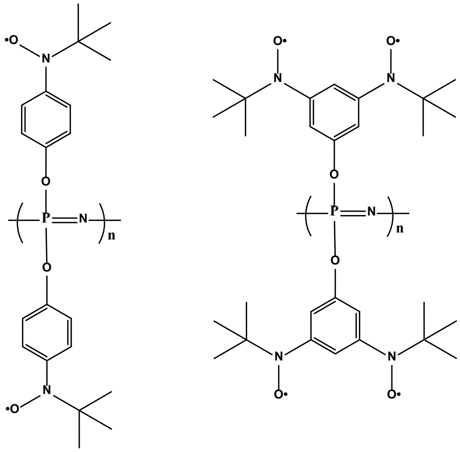

Figure: Radicalic Polymers

Acknowledgements: This work was supported by the Scientific and Technological Research Council of Turkey (TUBITAK), Project Number 114Z762.

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Keywords: Polyphosphazene, Polyradical, Organic Battery, Lithium battery

P-239

CHITOSAN EXTRACTION AND SYNTHESIS OF CHITOSAN CRYOGEL SCAFFOLDS

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Polymeric scaffolds produced by cryogelation technique have attracted increasing attention for tissue engineering applications [1]. Cryogelation is a technique which enables to produce interconnected porous matrices from the frozen reaction mixtures of polymers or monomeric precursors [2]. Chitosan is a biocompatible, biodegradable, nontoxic, antibacterial, antioxidant and antifungal natural polymer that is obtained by deacetylation of chitin, which is mostly found in the exoskeleton of many crustaceans [3]. In this study, chitin was isolated from the exoskeleton of blue crap (*Callinectes sapidus*) using a chemical method. *Callinectes sapidus* samples were collected from a market, as a waste material after it has been consumed as food. Demineralization, deproteinization and decolorization steps were applied to the samples to obtain chitin. Chitosan was prepared from isolated chitin by deacetylation at high temperatures. The chemical compositon, crystallinity and morphological structure of extracted chitin and chitosan were characterized with FTIR, XRD and SEM analyses. And also to determine the physicochemical and functional properties of the produced chitosan; solubility, water binding and fat binding analysis were performed. Chitosan cryogel scaffolds were prepared by crosslinking reaction at cryogenic conditions at constant amount of chitosan (1%, w/v) with different ratios of glutaraldehyde (1, 3, and 6%, v/v) as crosslinker. The chemical structure and pore morphology of the scaffolds were examined by FTIR and SEM. Also, the equilibrium swelling ratio and degradation rate of scaffolds have been determined. Collectively, the results suggested that the characterized chitosan cryogels can be potential scaffolds to be used in tissue engineering applications.

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Keywords: blue crab, chitin, chitosan, cryogel, tissue engineering

P-240

IMMOBILIZATION OF LIPASE ONTO THIOL-ENE PHOTOCURED POLYMERIC COATINGS

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Lipases (triacylglycerol ester hydrolases, EC 3.1.1.3) are atypical enzymes that catalyze both hydrolysis and formation of the ester bond between glycerol and long-chain fatty acids [1]. Lipases also catalyze various bioconversion reactions in a wide variety of organic solvents such as the hydrolysis, esterification, transesterification, aminolysis, and acidolysis [2]. Immobilization of enzymes is one of the most essential facets of modern biotechnology. This process frequently overcome the structural instability and allow repeated use, native enzymes have been successfully immobilized on different supports using various techniques and enables long-term stability/recyclability of the biocatalyst [3,4]. Because of the environmental conditions, free lipases are easily inactivated and hard to be recovering for reuse.

In this work, thiol-ene photocured coatings were prepared by mixing allylamine (AA), pentaerythritol tetrakis(3-mercaptopropionate) (PETMP), 1,3,5-Triallyl-1,3,5-triazine-2,4,6(1H,3H,5H)-trione (TAIC) and a photoinitiator. This photocurable mixture was then poured into Teflon molds and cured under UV light for about 100-120 seconds. Lipase (EC 3.1.1.3) from *Candida rugosa* was immobilized onto these coatings from the amine groups via glutaraldehyde activation as shown in Figure 1. Immobilization capacity of polymer was found 2.56 mg g^{-1}.The polymeric support was characterized by SEM-EDS and FTIR spectroscopy. Immobilized and free enzymes were used in two different reaction systems: hydrolysis of *p*-nitrophenyl palmitate in aqueous medium and synthesis of *p*-nitrophenyl linoleate (from *p*-nitrophenol and linoleic acid) in n-hexane medium. The effect of temperature on hydrolytic and synthetic activities was investigated and observed maximum activities at 50°C and 45°C for immobilized enzyme, orderly. At the end of 10 repeated cycles, 71% and 83% of initial activities remained for hydrolytic and synthetic assays, respectively. Native enzyme lost its activity completely within 20 days, whereas the immobilized enzyme retained for hydrolytic and synthetic activities was approximately 78% and 71%, respectively, under the same storage time.

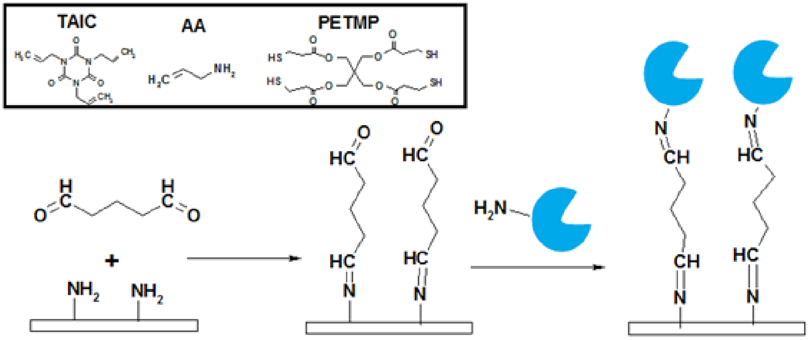

Figure 1: Illustration of the immobilization of Lipase onto aminated thiol-ene photocured coatings

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Keywords: Lipase, photocurable polymer, immobilization, hydrolytic activity, synthetic activity

P-241

THERMAL DEGRADATION OF POLY(B-ALANINE)-POLY(3-HYDROXYPROPIONATE) BLENDS

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Poly(β-alanine) (PBA) and poly(3-hidroxypropionate) (P3HP) were synthesized via base-catalyzed hydrogen transfer polymerization (HTP) of acrylamide and acrylic acid, respectively. Blends of poly(β-alanine)/ poly(3-hidroxypropionate) with different composition (P3HP content, 5% to 75%) were prepared with solution casting method and studied using DSC and TGA. Optical images of blends were transparent and entirely uniform. Melting temperature (T_m), thermal decomposition temperatures (T_d) and enthalpy of fusion (ΔH_f) of poly(3-hidroxypropionate) decreased with increasing poly(β-alanine) fraction in blend. Similarly, thermal decomposition temperatures (T_d) of PBA decreased up to 16 °C with increasing P3HP fraction in the blend.

Thermogravimetric analyses of neat components and blend films were performed to see the effect of each component on the decomposition behavior of the others. As shown in Figure .1, decomposition temperatures, T_d, of both components decreased gradually with increasing weight percentage of the other component for all PBA/ P3HP blends (except P3HP %75). The apparent decomposition temperatures for P3HP decreased by up to 26 °C in comparison to that of neat E3. Similarly, the thermal decomposition temperature of PBA was suppressed by 16 °C with increasing P3HP content. This behavior indicates strong interactions between the blend components in liquid phase (before decomposition). Strong segmental interactions weakened the chemical bonds in the backbones of each component, resulting in lower decomposition temperatures, as well as faster thermal decompositions.

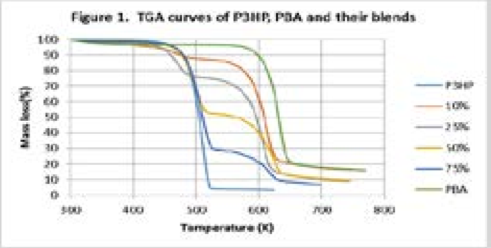

Figure 1. TGA curves of the neat polymers and their blends

Thermal degradation of both components were studied by Freeman-Carroll method. Activation energies of thermal degradations of blends were determined with a good regression coefficients (at least 0.994). Activation energies of decomposition decreased from 224.14 to 86.125 kJmol^{-1} with increasing P3HP content. Related data was summarized in Table.1.

Table.1 Data obtained from Freeman-Carroll method for thermal degradations of neat PBA and P3HP, and their blends.

%	n	Slope	E_A(kJ/mol)	R^2
P3HP	0.311	-10359	86.125	0.994
25	0.475	-10109	84.046	0.9961
50	-0.370	-13476	112.040	0.9985
75	0.198	-13702	113.918	0.9954
90	0.626	-18662	155.156	0.9995
PBA	-0.329	-26963	224.140	0.9996

Keywords: Thermal Degradation, Freeman-Carroll method, Thermogravimetry

P-242

SYNTHESIS AND CHARACTERIZATIONS OF NOVEL PHTHALOCYANINES FUSED BENZYL POLY(ε-CAPROLACTONE)S

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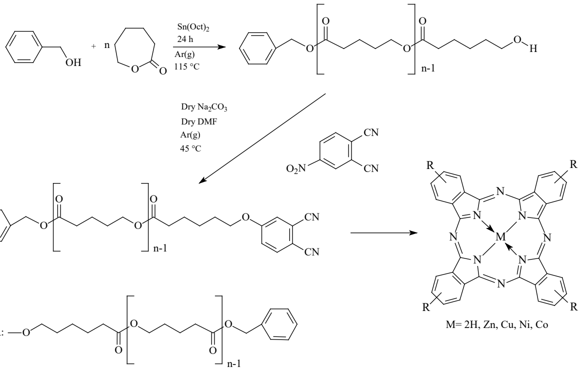
Phthalocyanines (Pcs) have attracted considerable attention due to their impressive and useful chemical and physical properties. The diverse functionality of the phthalocyanine macrocycle originates from its 18-π electron aromatic system [1]. Aliphatic polyesters are of significant interest owing to their unique biodegradability, biocompatibility and hydrolyzability. Among these polyesters, poly(ε-caprolactone) (PCL), and its copolymers are especially fascinating because of their potential applications as biomedical materials [2]. Pcs exhibit excellent photocatalytic properties. Polymer binding of a sensitizer can enhance the photocatalytic properties due to hindered intermolecular interaction of Pc molecules and the stabilizing effect of the surrounding polymer. Furthermore, combined polymer binding of different sensitizers and stabilization of Pt as catalyst for H_2 evolution from water may be possible. Additionally, it must be mentioned that a controlled synthesis of chemically modified electrodes is possible with monosubstituted compounds [1,3].The types of polymer are classifed by the way in which the macrocycle is incorporated within the macromolecular structure as either network, main-chain or side-chain polymers. There are three general methods for the synthesis of side-chain polymers in which the Pc unit is attached to a polymer backbone via a single linking group. These are (1) the grafting of a preformed Pc derivative to a preformed polymer, (2) a cyclotetramerisation involving a polymer bound phthalonitrile derivate and (3) polymerisation of a phthalocyanine containing monomer. In this study, defined benzyl poly(ε-caprolactone) (PCL-OH) was synthesized by ring opening method in bulk at 115°C using benzyl alcohol as initiator and stannous octanoate ($Sn(Oct)_2$ as catalyst. The –OH end group was then converted into its corresponding phtalonitrile via a base-catalyzed nucleophilic aromatic nitro displacement of 4-nitrophthalonitrile in order to prepare its corresponding phthalocyanine derivates using above method 2. The electrical conductivities of the polymers were measured in vacuum and in air-atmosphere. All the polymers have been characterized by UV-Vis, FT-IR and NMR spectral data and GPC, DSC, TGA techniques.



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Keywords: benzyl alcohol, Phthalocyanines,phthalonitrile

P-243

THE INVESTIGATION AND CONTROL OF THE STATIC ELECTRIFICATION IN POLYMERS

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In the static electrification in polymers, the physical properties play a crucial role, and it also affects the mechanical strength of polymers when the industrial applications are taken into account. The current studies about the physical properties concentrate on the effects in terms of the differentiations in mechanical properties mainly focusing on the elasticity of polymers. [1] However, the relation of the polymer structure with the triboelectrical property has not been studied in detail and remains unclear. Thus, by using various spectroscopic and microscopic techniques we investigated the relation between physical properties of polymers and their triboelectrical properties as it has a potential to be a milestone for the upcoming tribological research and additionally the results will be considerably useful for the industrial applications.

Acknowledgement

Thanks to TUBITAK (Türkiye Bilimsel ve Teknolojik Araştırma Kurumu) for supporting this resaerch with the project number 214M358.

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Keywords: Physical properties, polypropylene, triboelectricity

P-244

SYNTHESIS AND CHARACTERIZATION OF CONDUCTING POLYPYRROLE/EXPANDED PERLITE COMPOSITES

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Conducting polymers have attracted attention because of their promising applications in various area of electronics such as effective quantum electronic devices, magnetic recording materials, sensors, smart windows, toners in photocopying, conductive paints, drug delivery, rechargeable battery electrolytes and electrorheology [1-6]. Among the conducting polymers, polypyrrole (PPy) has attracted intense attention due to its environmental stability, ease of synthesis, exciting chemical and electrical properties. Turkey possesses about 70% of the world as known perlite reserves, perlite is one of the most important material because of its low thermal conductivity, high absorption of sound, low bulk density, and fire resistance, perlite aggregate plasters hold many advantages over conventional plaster. Conducting polymer/clay composites are a class of hybrid materials composed of an organic component and an inorganic component [7].

In this study, polypyrrole/expanded perlite (PPy/EP) composites were synthesized by in situ radicalic polimerization method with the presence of $(NH_4)_2S_2O_8$ in HCl medium. The structural and morphological properties of PPy/EP composites were characterizated by using Fourier Transform Infrared Spectroscopy (FTIR), thermal analysis (TGA), scanning electron microscopy (SEM-EDS) and X-Ray differaction (XRD) techniques. Some physical properties such as particle size, apparent density, dielectric constant, and conductivity of the particles were also determined. It was observed that the characterization results confirmed the successful synthesis of conducting PPy/EP composites. The conductivity of the composites was found in semiconducting range and increased with increasing PPy content. Thus, the PPy/EP composites may be considered as potential candidate for electrorheological smart materials.

Acknowledgements: The authors thanks to TUBITAK (214Z199) for the financial support of this work.

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Keywords: Conducting Polymer, Perlite, Composite

P-245

SYNTHESIS, CHARACTERIZATION AND ANTIMICROBIAL ACTIVITY OF CHITOSAN/PERLITE COMPOSITES

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In recent years hydrolytically and enzymatically degradable polymeric systems, so called biodegradable polymers, have gained much importance for designing environmentally friendly materials. Polysaccharide-based biodegradable polymers represent a major class of biomaterials, such as chitosan, chitin, starch, cellulose and alginate [1]. Chitosan [Poly (β-(1-4)-2-amino-2-deoxy-d-glucan] is N-deacetylated derivative of chitin, extracted from the shells of crustaceans like crabs and shrimps, which is a very interesting material due to its characteristics such as biodegradability, chemical inertness, biocompatibility, high mechanical strength, and low cost [2]. Turkey has high amount of perlite reserves (70% of the world reserves). Perlite is a volcanic origin rock formed during explosive eruptions. Perlite has an amorphous structure and SiO_2 and Al_2O_3 constitute its major contents. When perlite reaches temperatures of 850–1100 C, water trapped in the structure of the material vaporises and escapes, and this causes the expansion of the material to 4–35 times its original volume [3].

In this study, a series of chitosan/expanded perlite (CS/EP) composites with different chitosan mass fractions (10%, 20% and 50%) were chemically synthesized. Characterizations of the composites were carried out by FTIR, XRD, TGA and SEM-EDS techniques. Apparent densities, particle sizes and conductivities of the CS/EP composites were determined. These composites were also tested against bacterial and fungal strains by using inhibition zone method, as new hybrid bio-materials. The benefit of using biodegradable polymer is that they will decompose naturally over short periods of time. So it is very important to convert the material from biostable to biodegradable structure. It was observed that particle sizes of the CS/EP composites increased with increasing chitosan content, as expected; which can be attributed to the strong interactions between negatively charged expanded perlite and polycationic CS chains. Higher chitosan content into porous expanded perlite networks was confirmed by SEM-EDS results. The antimicrobial activity of the composites increased with increasing chitosan concentration.

Acknowledgements: The authors thank to the TUBITAK (214Z199) and Scientific Research Projects Unit of Süleyman Demirel University (4479-YL2-15) for the financial support of this work.

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Keywords: Chitosan, Perlite, Antimicrobial Activity, Composite

P-246

PREPARATION AND APPLICATION OF BIOCOMPATIBLE CARRIER IMPLANT TO BE USED IN THE CONTROLLED PURCHASE OF DIGOXIN

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In the current study, we aimed to make controlled-release profile of Digoxin active ingredients used in the treatment of heart failure, while poly hydroxy ethyl methacrylate (pHEMA) developed as a biomaterial can be used in the controlled drug release system.

pHEMA and p(HEMA-MMA) hydrogel was prepared with UV photopolymerization method in the form of cylinder. Biocompatiible is improved by adding respectively PEO, PEG and serum albümine to the structures of p(HEMA-MMA). It was done the evaluation of FTIR, SEM, DSC, contact angle for the characterization of the prepared copolymers. In order to detect swelling behavior, solvent molecules transfered to the swellable hydrogel. The emission profiles have been done with the spectrophotometric method.

It was showed that carrier implant p(HEMA-MMA) obtained by adding MMA to biocompatible hydrogel pHEMA was more biocompatible than pHEMA. It was observed that 25, 50, 100, 250 and 500 ul Digoxin adding to p(HEMA-MMA) release studies provided the best results as spectrophotometric with 380 nm wavelength. It was decided that p(HEMA-MMA) hydrogel added PEG could be used in the controlled-release studies of Digoxin, the active ingredient of drugs used in the treatment of chronic heart failure.

In conclusion, although PEO and PEG have similar features, digoxin couldn't be installed to hydrogels created with PEO. So p(HEMA-MMA) combined with PEG is a biocompatible material that should be used in controlled release of Digoxin.

Keywords: pHEMA, p(HEMA-MMA), Characterization, Controlled release.

P-248

LACCASE IMMOBILIZED POLYACRYLAMIDE-ALGINATE CRYOGELS: SYNTHESIS AND DYE DECOLORIZATION EFFICIENCY

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Laccases (EC 1.10.3.2) are important oxidoreductases for industrial sectors related to baking, dye, textile, paper, fruit juice processing and wastewater. These copper-containing biocatalysts show low substrate specifity and have the ability to oxidise a wide range of substrates. Immobilization of laccase on supports allows the enzyme to be more stable against temperature and pH changes, storage and operation conditions [1].

Enzyme immobilization is a promising strategy offering several improvements for enzyme applications. The major advantages of immobilization are enhanced thermostability and operational stability, resistance to extreme conditions [2].

The supporting material plays a significant role for an efficient immobilization. Cryogels have gained attention as immobilization supports that enable to attach enzymes in recent years. Cryogels are supermacroporous gels synthesized under freezing conditions that combines crystallization of the solvent to form macropores with polymerization of monomer(s) [3,4].

Polyacrylamide-alginate cryogels (PAC) synthesized in this work, provide advantages of using both synthetic and natural polymers. PAC were prepared by free radical polymerization of acrylamide with N,N'-methylene bisacrylamide mixed with alginate solution. Glycidyl methacrylate was added to the solution to functionalize the cryogels with epoxy groups upon which laccase was immobilized via amino groups of the enzyme. Solution was transferred into plastic syringes and kept at -18°C for 24 h. After thawing, cryogels were washed with distilled water.

Cryogels were characterized by FTIR, SEM, BET techniques. Laccase was covalently immobilized onto epoxy bearing cryogels by continuously pumping the enzyme solution through the column using a peristaltic pump. Maximum attachment of laccase was achieved at pH 5.5 acetate buffer at 25°C. Immobilized enzyme amount was calculated as 60.86 mg enzyme/g cryogel. Kinetic parameters of free and immobilized laccases were determined using syringaldazine as substrate. Dye decolorization efficiency of laccase immobilized cryogel towards Reactive Green 5 was 85%.

Acknowledgements: This work is supported by Coordinatorship of Scientific Research Projects (BAP) of Adnan Menderes University by project: FEF-15024.

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Keywords: alginate, cryogel, decolorization, immobilization, laccase, polyacrylamide

P-249

FUNDAMENTAL OPTICAL PROPERTIES AND *COMPARISON OF OPTICAL AND ELECTRICAL CONDUCTANCE* OF THE 2-OHBT MATERIAL

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2-Hydroxybenzothiazole (2-OHBT) is important polymer applications. In this study, 2-OHBT material and acetone solvent were used. The chemical structure of 2-OHBT material is shown in *Figure.1*. The optical measurements have been performed by using Shimadzu model UV-1800 Spectrophotometer at room temperature.

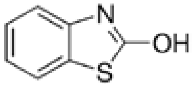

Figure 1: The chemical structure of 2-OHBT material.

Fundamental optical parameters such as absorption coefficient, molar/mass extinction coefficient, absorption band edge, optical band gap, incidence/refraction angle and real/imaginary parts of dielectric constant were determined and compared with the related studies in the literature.

The optical conductance (σ_{op}) and electrical conductance (σ_{elec}) of the 2-OHBT are calculated with following equations [1],

$$\sigma_{op} = \frac{\alpha n c}{4\pi} \quad (1) \qquad \text{and} \qquad \sigma_{elec} = \frac{2\lambda\sigma_{op}}{\alpha} \quad (2)$$

Figure.2 shows the ratio plot of the $\sigma_{opt}/\sigma_{elec}$ versus photon energy (E) of the 2-OHBT. As seen in Fig. 2, the optical conductance values of the 2-OHBT are higher than the electrical conductance values of the 2-OHBT. The $\sigma_{opt}/\sigma_{elec}$ ratio of the 2-OHBT remains almost constant until about 3.2 eV, then it increases sharply with increasing photon energy. This increase can be attributed to increase in the absorption coefficient in this region.

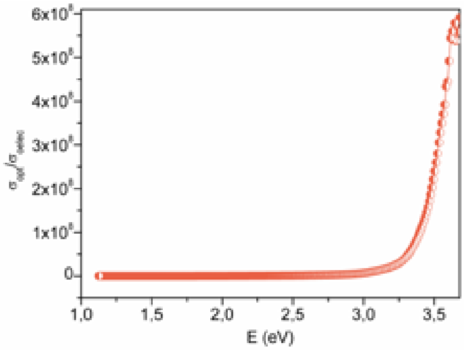

Figure 2: The ratio plot of the $\sigma_{opt}/\sigma_{elec}$ versus photon energy (E) of the 2-OHBT material.

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Keywords: 2-OHBT material, electrical conductance, molar/mass extinction coefficient, optical band gap, optical conductance, optical properties.

P-251

INVESTIGATION OF RESIDENTIAL WASTE OIL'S COLLECTING MECHANISM AND BIODIESEL PRODUCTION WITH TRANSESTERIFICATION

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Waste oil causes environmental pollution and it must be recycled to reduce its environmental pollution. The purpose of this study is recycled waste cooking oil which collected from houses, by the transesterification reaction. Biodiesel is obtained at the end of the recycling procedure [1-2]. The main step of the procedure is transesterification reaction.

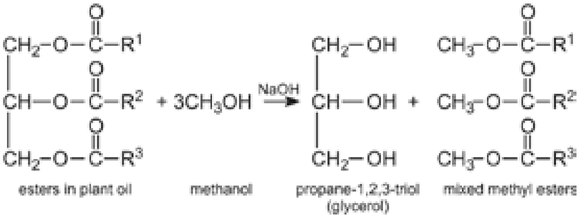

Fig. Transesterification reaction.

Various tests were conducted for the obtained biodiesel product. These tests are flash point, density, viscosity, pH. The results obtained were compared with the standard EN 14214.

This study also investigates the mechanism of collection residential waste vegetable oil and review the possible solutions [3].

Acknowledgements: This work was supported by Kırklareli University Scientific Research Projects Coordination [Project No: KLÜBAP / 088].

And TÜÇEV (Environmental Protection Foundation of Turkey), thanks to the financial support it provides.

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Keywords: Esterification, Transesterification, Waste oil.

P-252

COMPARISON OF CATALYTIC ACTIVIES BOTH FOR SELECTIVE OXIDATION AND DECOMPOSITION OF AMMONIA OVER Fe/HZβ CATALYST

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Gasification, is a thermochemical conversion technology applied for the production of synthetic fuels and chemicals from coal and biomass. A syngas containing H_2 and CO is released as a result of gasification reactions. Synthetic fuels and chemicals are catalytically produced from this syngas through the Fischer-Tropsch (FT) method. Before FT reaction, the syngas should be cleaned to remove all nitrogenous (NH_3, HCN) and sulfurous (H_2S, COS) pollutants in ppm level, otherwise they lead to the poisoning of the FT catalysts shortly. While NH_3 concentrations can be reached up to 10000 ppmv in syngas as a function of the nitrogen content of the solid fuel [1], its threshold level of is below 1 ppmv [2]. NH_3 removal can be achieved via three different ways; scrubbing, thermal incineration and catalytic oxidation. In the scrubbing as a wet process, the waste gas is washed with a chemical solution and it is necessary to treat the waste water further. In the thermal incineration, ammonia is thermally burnt and NO_x is formed. In the catalytic processes; NH_3 is passed through a column packed with a catalyst. In the one way of catalytic routes, NH_3 in the syngas can oxidatively be converted into harmless nitrogen and water exothermically. This process is called as selective catalytic oxidation (SCO). In the second way of the catalytic route, NH_3 can be decomposed into hydrogen and nitrogen via the non-oxidative endothermic reaction [3]. In this study, the catalytic activities over Zeolite Hβ supported iron catalyst (Fe/HZβ) were compared both for the two catalytic routes, namely SCO and Catalytic Decomposition. Fe/HZβ has been prepared to have an iron (Fe) content of 10% on weight basis via the wet impregnation method and characterized. SiO_2 to Al_2O_3 ratio of Hβ zeolite was 38. This zeolite was intentionally chosen since this ratio was considered to be close to the optimum as claimed previously by the authors of this presentation [3]. For SCO experiments; temperature (300-500 °C), O_2 (2000-6000 ppmv) and (0-10%) H_2 concentrations were the investigated parameters with 800 ppm NH_3 in each of the final gas mixture. In the second route, catalytic ammonia decomposition experiments were carried out with H_2 in balance N_2 (0-30%) containing 800 ppm NH_3 at 700°C and 800°C. In the former case (SCO), NH_3 conversions were increased with increasing reaction temperatures with the absence of H_2 in the reaction mixture. It was interesting to see that while complete NH_3 conversion was achieved at 500 °C, H_2O concentration as a byproduct only increased up to the reaction temperature of 450 °C. This was considered to be due to the potential secondary reactions between NO_2/N_2O and H_2O to give HNO_3/NH_4NO_3. SCO reaction was carried out at different O_2 concentrations at 500 °C as well. It was shown that although any remarkable conversion was not recorded with the absence of O_2, an outlet NH_3 conversion of 50 ppm was achieved with 2000 ppm O_2 addition. Upon O_2 treatment, metallic iron phase was concurrently oxidized as apparent from the color change and XRD patterns of the used catalyst. With further increase in O_2 concentration to 6000 ppm, outlet NH_3 conversion was further reduced to 5 ppm. While over 99% NH_3 conversion was achieved in the presence of 4000 ppm O_2, at 500 °C and without H_2, NH_3 conversion was decreased to 17% when 10% of H_2 was added to the reaction media under the same condition. With 10% H_2, it was shown that NH_3 conversions increased to 41% with decreasing the reaction temperature to 400 °C. This was interpreted as the competing H_2 and NH_3 oxidations over the catalyst. On the other hand, in the latter case (catalytic decomposition), 92% and 97% NH_3 conversion values were achieved at 700 and 800 °C respectively in the presence of 10% H_2. Fe/HZβ catalyst selectively converted all NH_3

to N_2 and H_2 without being much affected with the presence of $H_{2.}$ It was shown that Fe/HZβ catalyst is better to use for catalytic decomposition of NH_3 rather than SCO of NH_3 in spite of higher reaction temperatures needed.

Acknowledgements: The authors greatly acknowledge to "The Scientific and Technological Research Council of Turkey (TÜBİTAK)" for supporting of "Liquid Fuel Production from Biomass and Coal Blends" project (Contract Code: 108G043) in which this study was carried out.

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Keywords: Hot Syngas Clean-Up, Ammonia, Decomposition, Selective Catalytic Oxidation (SCO)

P-253

INVESTIGATE THE HYDROCRACKING PROCESS OF TAR IN THE PRESENCE OF MODIFICATED NANOSRUCTURAL HALLOYSITE

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Hydrocracking is one of the most effective processes of destructive refining of heavy residual raw materials for increasing production of high-quality motor fuels. Today, there are about 50 technologies of hydrocracking of oil residues. However, their extensive introduction entails great capital and operating expenditures, since the existing hydrocracking processes, allowing the depth of oil processing to be increased to 80-85 %, are realized, as a rule, under 15-27 MPa pressure at the expensive units[1-5]. In connection with the above stated, development of the technology capable of realizing deep hydroconversion of heavy oil residues under moderate pressure using special technological methods, is of doubtless interest.

The purpose of the work is to investigation the obtaining process of fuel components from low-pressure hydrocracking of the goudron obtained from Baku oils in the presence of modificated suspended halloysite with transition metals (Ni, Co) for obtaining additional (extra) light oil products in order to deepen the oil refining.

The analysis of the obtained results showed that upon hydrocracking of goudron over the modificated suspended high-dispersed halloysite with transition metals the yield of the light products was significant and made 50-52% mas.

The influence of temperature to the hydrocracking process of goudron had been investigated in the interval of 400-460 °C at the pressure of 1.0 MPa, but the effect of the pressure was studied in the interval of 1.0-4.0 MPa at 450 °C. By the modification the halloysite with transition metals-Ni and Co the yield of light petroleum products increases about 2 % and constitutes 52% mass in the same rejime parameters : temperature- 450 °C and pressure -1.0 MPa. Coke yield decreases from 10.0 to 7.0 % mass. With increase of pressure from 1.0 to 4.0 MPa (at 450 °C temperature) the yield of light petroleum products increases about 7% and constitutes 57% mass , coke yield decreases from 10.0 to 4.0 % mass. In spite the increasing the yield light petroleum products 2 % by the modification of halloysite with Ni and Co, it was observed the changes the qualitative characteristics of products of hydrocracking process of goudron. So, using the modificated halloysite significantly influence the hydrocarbon content of the obtained products. The content of paraffins and iso-paraffins in gasoline fraction increases from 33.7 and 31.7% to 38 and 44% respectively. The content of aromatic and unsaturated hydrocarbons decreases from 17 and 5 % to 5 and 0.68% respectively. The octane number is 71-74 p. The consideration of the quality of gasoline and diesel fractions shows that after the additional hydrotreatment of obtained products can be recommended as the components for fuels.

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Keywords: halloysite, goudron, hydrocracking

P-254

SYNTHESIS, CHARACTERIZATION AND CATALYTIC PERFORMANCE OF THE TITANIUM- AND TITANIUM-BENTONITE IMPREGNATED BY CHROMIUM AND CERIUM-CHROMIUM

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Pillared clays have molecular sieve properties and do not exhibit layer deformation at elevated temperatures. They are appropriate construction materials for catalytic reactions due to their high adsorption and active catalyzer centers. In this study, Ti-pillared bentonite (Ti-PB) synthesis was conducted using bentonite clay mineral with a large amount of montmorillonite obtained from Hançılı region in Ankara. After calcination of Ti-PB at 400°C for 3 hours, impregnated Ti-pillared bentonites were prepared using chromium and cerium/chromium through a wet impregnation method. Synthesized products were characterized by Scanning Electron Microscopy/Electron Dispersive X-ray Spectroscopy (SEM/EDX), X-Ray Diffraction (XRD), Thermogravimetric Analysis (TGA), and Fourier Transform Infrared Spectroscopy (FTIR) before and after NH_3-adsorption and N_2-adsorption/desorption. Their catalytic performances were tested in catalytic wet peroxide oxidation reaction of diclofenac. It was observed from chemical analysis results that titanium, chromium, and cerium were embedded into the structure through pillaring. Moreover, the presence of characteristic peaks of TiO_2, Cr_2O_3, and CeO_2 phases in the XRD patterns of Ti-PB, chromium impregnated-titanium-pillared bentonite (Cr@Ti-PB), and cerium/chromium-impregnated-titanium-pillared bentonite (Ce/Cr@Ti-PB) catalyzers confirmed that these metals settled into the structure or were attached to the surface. The results of nitrogen physisorption showed that the highest surface area and pore volume values were obtained in the Ti-pillars. It was observed that surface area and pore volume values decreased after the impregnation with Cr and Ce/Cr. In FTIR spectra, increases were observed in Brønsted and Lewis acidities, as well as by the pillaring with the titanium pillars, and chromium and cerium loading. Catalytic performance studies showed that the catalytic performance of Ti-PB decreased after impregnation of chromium but increased after impregnation of cerium/chromium. However, during the reaction, catalytic performance studies were performed using the Ti-PB sample because Cr transition to the mixture of reaction was high in the samples other than Cr@Ti-PB and Ce/Cr@Ti-PB samples. A complete transformation to diclofenac was achieved using a 5 mg/L diclofenac and 3 g/L catalyzer concentration at T=25°C and pH=4 for 60 minutes. It was observed that diclofenac transformation decreased with increasing pH, increased with increasing catalyzer concentration, and H_2O_2/DCF ratio, increasing with increasing diclofenac concentration up to 10 mg/L, but decreased above that concentration.

Keywords: Titanium, cerium an chromium, pillared bentonite, synthesis, characterization, catalytic performance

P-255

PHOTOCATALYTIC ACTIVITIES OF DOPED ZIF-8 NANOCRYSTALS

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Photocatalysis is expected to have great contribution to the solution of environmental problems such as water and air pollution in the near future [1]. The design of photocatalysts with high electron-hole generation rates, high surface areas and high light absorption capacities is crucial in producing sustainable and cost-effective photocatalytic processes. Titania, zirconia, copper oxide, zinc oxide, iron oxide are widely used photocatalysts which have good light absorption capacities with moderate surface areas depending on the synthesis conditions [2]. In the last decade metal organic frameworks (MOFs) have been used in photocatalytic applications due to their very high surface areas up to 1000s of m^2/g and adequate light absorption capacities [3]. In this study zeolitic imidazolate framework (ZIF) based MOF photocatalytsts were prepared and the effect of doping on the photocatalytic activity of ZIF-8 was investigated. Silver and neodymium doped ZIF-8 nanocrystals (zinc-imidazole based ZIF) were prepared and their activities in the photocatalytic degradation of methylene blue dye under UV-Vis irradiation were determined for the first time in the literature. Doped ZIF-8 crystals showed better photocatalytic activities compared to the un-doped ZIF-8 crystal as shown in Figure 1. The higher photocatalytic activities of the doped crystals may be attributed to the faster charge carrier transport induced by the change in the crystallite sizes and introduced impurity energy levels of the dopant ions.

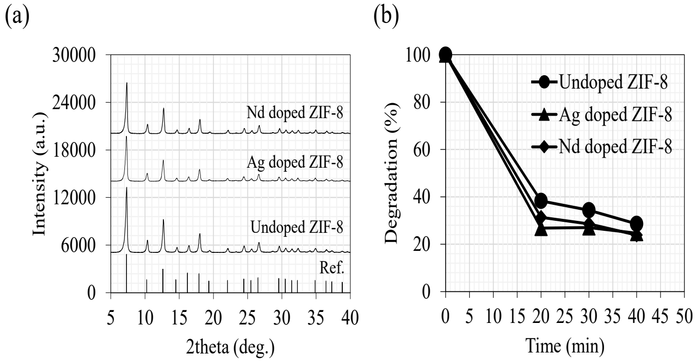

Figure 1: (a) XRD patterns, (b) Photocatalytic activities of doped ZIF-8 nanocrystals.

Acknowledgements: This study was supported by The Scientific and Technological Research Council of Turkey (TUBITAK) within the context of 214M012 project.

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Keywords: photocatalysis, doping, zif-8

P-256

SYNTHESIS AND CHARACTERIZATION OF IONIC LIQUIDS

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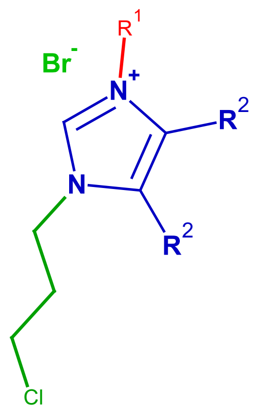
Since there are many useful application of ionic liquids as solvents, catalysts, lubricants, electrical conductors etc., they have attracted the attention of many researchers [1]. Their physical and chemical properties can be adjusted easily with the synthetic route.

For the present study, we have synthesized[2] several imidazolium based ionic liquids functionalized with chloropropyl group (Figure 1), and characterized them by ^{1}H- ^{13}C NMR, FTIR, UV, elemental analysis, TGA and cyclic voltammetry. Possible application areas of the synthesized ionic liquids have been suggested in the light of obtained characterization data.

Comparison study of the present ionic liquids with the well-known ones {BmimBr, BmimI and Bmim[PF_6]} have also discussed.



	R^1	R^2
a	Ethyl	H
b	Butyl	H
c	Octyl	H
d	Dodecyl	H
e	hexadecyl	H
f	Ethyl	Cl
g	Butyl	Cl
h	Octyl	Cl
I	Dodecyl	Cl
k	hexadecyl	Cl

Figure 1: Structure of ionic liquids

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Keywords: Ionic Liquds, Synthesis, characterization

P-257

SYNTHESIS OF NEW TYPE OF SECONDERAMIN-BENZOYLTHIOUREA DERIVATIVES: INVESTIGATION OF CATALYTIC ACTIVITY IN SUZUKI COUPLING REACTIONS

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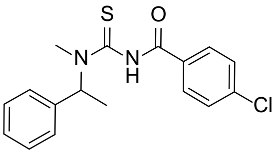
The number of studies on using the organometalic compunds both directly in organic synthesis and as catalyst in the reactions like hydrogenation, isomerisation and polimerisation of olefines has increased also some of the developed catalysts have been used in industrial scale. Especially those ligands of benzoiltiyoüre have an important place in coordination chemistry. The studies on these types of ligands are getting more interesting because of their biological activities, high thermal stability, the availibility of the synthesis conditions [1,2].

In this study 4-chloro-N-((3-fluorobenzyl)(methyl)carbamothionyl)benzamide (L1), 2-chloro-N-((3-fluorobenzyl)(methyl)carbamothionyl)benzamide (L2) and 4-chloro-N-(methyl(1-phenylethyl)carbamothionyl)benzamide (L3) ligands in secondary amine benzoylthiurea structure have been sythesized. The structures of the compounds have been characterized by using FT-IR, ^{1}H-NMR, ^{13}C-NMR methods and catalytical activities of the catalysts have been in-situ analyzed in Suzuki coupling reactions known as C-C coupling reactions. Catalytical activities have been investigated by GC-MS informs of conversion percentages of aryl halides into biphenyl derivatives.



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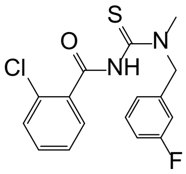

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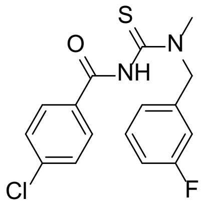

L3

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Keywords: Suzuki C-C coupling reactions, catalytical activity, secondary amine, benzoylthiourea, organometalic compounds

P-258

SYNTHESIS OF NEW TYPE OF SALEN COMPOUNDS USED AS CATALYST

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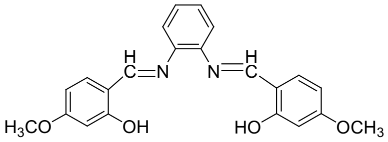
Schiff bases that has azomethin (-CH=N) groups are formulised as R-CH=NR compounds. These compounds can be formed by the reaction between acetyl acetone, salicyl aldehyde and aminothiols, o-amino phenols, a-aminoacids, aminoalchohols.

Recently, the number of studies on these types of compounds used as catalyst is getting more important since schiff bases are easily synthesized, and have high chemical and thermal stability.

Additionally, these compounds are being also used as polimerization inhibitors, antioxydants, agricultural chemicals and in pharmaceuticals [1,2]

In this study, (N,N'-Bis(4-(methoxy)salicylaldehyde)-1,2-phenylendiamine (L1) ve N,N'-Bis(3-(ethoxy) salicylaldehyde)-1,2-phenylendiamine) (L2) ligands and their Cu(II) and Pd(II) complexes were synthesized. The structures of the compounds have been characterized by using FT-IR, ^{1}H-NMR, ^{13}C-NMR and methods.



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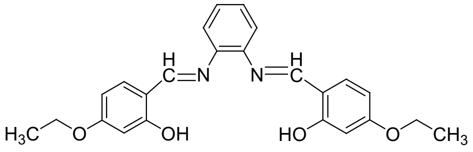

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Keywords: Schiff Bases, Salen, Complex, Catalysis

P-259

INTERACTIONS BETWEEN DYE AND SURFACTANT SYSYTEMS

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Surfactants are used in dye industry among the different industrial applications especially they can wet and help in the dispersion of poorly soluble dyes. Dyes can also be used in many ways for measuring critical micelle concentration (CMC) of surfactants known as dye-solubilization method. Studies on dye-surfactant interaction is important from the fundamental understanding point of view as well as industrial applications [1-2]. In this paper, the interaction phenomenon between oppositely charged –an anionic dye- Indigo carmine (IC) and cationic surfactants; cetyltrimethylammonium bromide (C_{16}TAB), cetylpyridinium bromide(C_{16}PB) and cetylpyridinium chloride (C_{16}PC) were studied at 298 K using UV-vis spectrophotometry. The changes of absorbance were observed as a function of the concentration of surfactants at their below and above the CMC. The absorption spectra were used to quantify the binding constants by means of Benesi-Hildebrand equation. Comparison of the binding degree of IC to micelles indicates a direct correlation between binding constant and hydrophobicity. It was observed that the CMC values of cationic surfactants decreased in the presence of IC. The CMC values of cationic surfactants decreased in the presence of IC has a direct relation between hydrophobicity of surfactants. The association of IC with cationic micelles followed the order as; $C_{16}PB > C_{16}PC > C_{16}TAB$. The results also showed that hydrophobic interaction plays a major role in interaction process of IC with anionic micelles besides electrostatic interactions.

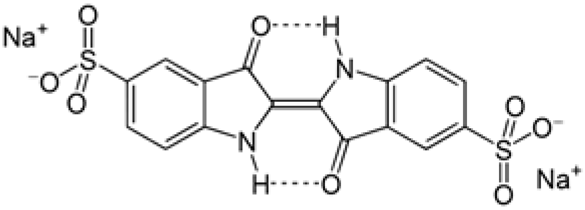

Figure 1: Molecular structure of Indigo carmine.

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Keywords: Dye, Surfactant, Interactions, Micellar binding

P-260

BIOREMOVAL OF REACTIVE DYE REMAZOL NAVY BY KEFIR GRAINS

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Dyes are synthetic chemical compounds widely used in textile industry. The textile industry and its dye contaminated effluent have been increasing proportionally with the increasing demand to the textile products. The pollution by dyes leads to reduction of sunlight penetration in waters and decrease photosynthetic activity and dissolved oxygen concentration for aquatic life. Moreover, most of dyes and their breakdown products are toxic, carcinogenic, or allergenic. Because of these reasons it is necessary to remove the dyes and their breakdown pollutants from wastewaters prior to discharge into environment.

Several physicochemical methods such as coagulation, flocculation, precipitation adsorption, photo-oxidation, electrochemical treatment, photo degradation are available with varying degree of success for removal of dyes from wastewater. Recently, the dye removal studies focused on microbial biomass as treatment with microorganisms is eco-friendly and cost effective.

In the present study the potential use of active and inactive kefir grains (small, yellowish and unevenly shaped masses similar to cauliflower florets that comprised of *lactococci, lactobacilli* and yeasts in a protein–polysaccharide matrix) on the removal of reactive dye Remazol Navy from aqueous solutions were investigated. The bioremoval processes were carried out under different process conditions such as initial pH, dye concentration and temperature. Also modelling studies were performed to determine the most appropriate decolourization kinetics and biosorption isotherm models.

Keywords: waste water, dye removal, kefir

P-261

DETERMINATION OF BISPHENOL A IN THERMAL PAPER RECEIPTS

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Bisphenol A (BPA, 2,2-bis(4-hydroxyphenyl) propane) is a high production volume industrial chemical. It is mainly used as monomer in the production of polycarbonate plastics, epoxy resins and the paper industry as color developer in thermal paper. BPA has been widely studied because of its adverse effect on the human health, especially endocrine modulating activity. The primary source of exposure to BPA for most people is through the diet. While air, dust, and water are other possible sources of exposure, additionally absorption of BPA via the skin from handling thermal papers receipts for the majority of daily human exposure.Thermal papers are used cash receipts, cinema tickets, airline tickets, lottery tickets and tickets for transportations (1-5).The aim of the present study was to develop a high pressure liquid chromatography (HPLC) method without derivatization for the determination of BPA in a thermal paper cash register receipt. Thermal paper was cut into small pieces and placed into the water during 60 mins. After extraction, sampling was designed for different times; 1.0, 5.0, 10, 15, 30 and 60 mins for HPLC analyses. HPLC experiments were carried out on a Agilent 1200 Series high pressure liquid chromatography system equipped with an Supelco C_{18} Column (100x2.1 mm, partical size 2.7µm) using a mobile phase composed of water/acetonitrile (60:40, v/v) at a flow rate of 0.4 mL/min; the column temperature was 30C°. Fluorescence excitation and emission wavelengths for BPA detection were 225 and 310 nm respectively.Amount of BPA migration into the water were determined as shown in Table 1. A simple and efficient high pressure liquid chromatography (HPLC) method was developed without derivatization for the determination of BPA in a thermal paper cash register receipt. Further studies will involve food packages.

Table 1.Concentration of BPA into water.

Time (min)	Water (mg/g)
1	0.78
5	9.08
10	16.8
15	20.2
30	21.0
60	21.6

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Keywords: Bisphenol A, Thermal Paper, HPLC

P-262

THE RADIOACTIVITY CONCENTRATIONS OF GROSS ALPHA/BETA THROUGHOUT THE FOOD CHAIN

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Measurements of radioactivity in environment and in foodstuffs are extremely important for controlling radiation levels to which mankind is direct or indirectly exposed. Radionuclides released to the environment may reach the human body through several transfer pathways and the soil-plant-milk pathway is considered as one of the important ways through which radionuclides can enter the human body.

Radionuclides sources on human diet are come mainly from milk, meat and other products more frequently consumed. Milk is one of the basic foodstuffs for many people, especially for infants. Radionuclides come into cows and consequently in milk through cow's food. In the areas with higher natural radioactivity levels, one could reasonably expect higher activity concentrations of natural radionuclides in milk than in other areas. Manmade radionuclides such as ^{90}Sr and ^{131}I, which can be released due to different human activities, can also come into milk and consequently increase the radiation dose for humans.

In this study, gross alpha/beta radioactivities were analysed in soil, in the feeding products (plant and bait) and in cow's milk, and the data used to calculated the annual effective dose equivalents due to gross radioactivity.

The following equation was used to calculate the doses [1,2].

$$DR_m = A_m \times IR_m \times ID_F$$

where DR_m; annual effective dose equivalent (mSv/y), A_m; gross alpha and gross beta activities (Bq/kg), IR_m; intake of milk for person in 1 year (kg/y). The annual effective dose equivalents were calculated for adults, children and infants that daily milk intake are 105, 110 and 120 kg of milk per year, respectively. ID_F; ingestion effective dose equivalent factor (mSv/Bq). The gross alpha activities were assumed to be from ^{238}U, ^{234}U, ^{230}Th, ^{226}Ra, ^{210}Po, ^{232}Th, respectively. The gross beta activities were assumed to be from ^{210}Pb and ^{228}Ra. In order to estimate the total annual effective dose from the average gross alpha and beta activity [2], effective dose equivalent factors of ^{226}Ra and ^{228}Ra werev used in our calculations. Dose equivalent factors of ^{226}Ra and ^{228}Ra published by the WHO [3] are $2.8\times^{4-}10$ mSv/Bq and 6.9×10^{-4} mSv/Bq, respectively.

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Keywords: Gross Alpha, Gross Beta, Milk, Plant, Soil, Water

P-263

SURFACE MODIFICATION OF GRANULAR ACTIVATED CARBON (GAC) FOR ADSORPTION OF URANYL ION

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Uranium is one of the most dangerous heavy metals in the environment because of its chemical toxicity and radioactivity. Uranium have entered into the environment through the several ways as nuclear industry, geological formations, agricultural applications. It is usually found in the environment in the hexavalent form. Since the 1950s, great efforts have been focused on new materials and technologies for separation of uranium from aqueous solution. many processes have been proposed for uranium(VI) removal from industrial waste waters and radioactive wastes. Chemical precipitation, ion exchange, solvent extraction and adsorption are the most commonly used methods.

Adsorption is an important technique in separation and purification processes which is used in water and waste water industry to the removal of uranyl ion. Among the numerous adsorbents, activated carbon is one of the most extensive adsorbents of the removal of metal ions from aqueous solution due to its large surface area, high adsorption capacity, porous structure, selective adsorption and high purity standards.

Recently, surface modification of activated carbon has been recognized as an attractive approach to improve and/or enhance the removal of metals from wastewater. Surface modification of granular activated carbon is performed using acid treatment, base treatment, impregnation treatment, ozone treatment, surfactant treatment, plasma treatment and microwave treatment. The methods of modification greatly influence surface functional groups and pore structure of the activated carbon.

In this study, nitric acid oxidation and $KMnO_4$ modification were used for surface modification of activated carbon. Commercial granular activated carbon (GAC) was milled (size<0.1 mm), washed with distilled water and dried in an oven **(AC1).** For acid oxidation, AC1 was treated by 6 M HNO_3 according to the procedure described by Elhendawy [1]. The adsorbent was subsequently washed with deionized water to neutral pH and dried in an oven **(AC2).** For $KMnO_4$ modification, the AC1 was immersed in potassium permanganate solution (0.03 mol/L) for 12h and the resulting solution was filtrated [2]. Then the filtrate was rinsed with deionized water and dried under constant-temperature **(AC3).**

To evaluate the characteristics of the granular and modified activated carbon, the specific surface area and the functional group of the material were determined BET (Brunaeur, Emmet and Teller) method and FT-IR (Fourier transform infrared spectrometer), respectively.

Adsorption measurements were carried out by a batch technique. Uranium solutions were prepared using uranyl acetate dihydrate ($UO_2(CH_3COO)_2{\cdot}2H_2O$) (Merck). Batch equilibrium studies were carried out by shaking known amounts of activated carbon**s (AC2, AC3)** and uranium solution at current temperature and pH. The solutions were then filtered, and the concentration of uranium in aqueous solutions was determined by the arsenazo-III method using a UV-Vis spectrophotometer**.**

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Keywords: Adsorption, Activated carbon, Uranyl

P-265

A STUDY FOR SAFE CHEMICAL STORAGE USED IN THE ANALYSIS FOR ACCREDITATION

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This study is the accreditation process for the safe chemical storage, used for analysis.

This study aimed at the safe storage of liquid chemicals, which is found Banaz Vocational School of Chemistry and Chemical Process Technology in the Department of Chemistry Laboratory, according to the Regulation published December 11, 2013 dated and 28848 numbered Official Newspaper, Republic of Turkey, the Classification, Labeling and Packaging of substances and mixtures [1].

This study includes the current 41 liquid chemicals, which is found in the Banaz Vocational School laboratory. Label information of these chemicals have been found from the list in Annex section third Table 3.2. pages from 996 to 1630. These chemicals were grouped according to hazard class (Physical hazards (flammable, explosive, oxidizing potential), hazard for human health, and environment hazard). Chemicals are divided into groups and placed individually in ventilated chemical cupboard. Hazard symbols and chemical list was pasted on the chemical cabinet.

Acknowledgements: University of Usak.

References:

[1] The Regulation (No 28848) published in 11 December 2013 in the Republic of Turkey Official Newspaper of the Regulation on the classification, labeling and packaging of substances and mixtures.

Keywords: CLP, MSDS, Laboratory safety, Accreditation.

P-266

ENZYMATIC REMOVAL OF HEAVY METALS USING POLYMER/CLAY COMPOSITE AS SUPPORT

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Environmental monitoring of heavy metal pollution is very importance due to its wide distribution in nature such as soil, air, streams, lakes and groundwater reservoirs [1,2]. They cause several health problems for accumulate in the organism and toxic at low concentrations [3]. Many studies have been made to removal from the contaminated source them. Enzymes are widely used in heavy metal removal from wastewater. However, for long-term protection of their activities is important be immobilized on the a support material [4,5].

In this study, papain was immobilized onto chitosan / clay composite sphere and investigated its capability of removal heavy metal from aqueous solution. Chitosan is abundant, eco-friendly and economical material. However, it has relatively poor mechanical features that are restricted its usage as a support. In this study, clay was added to improve the mechanical properties of chitosan sphere and chitosan/clay composite spheres have been used as support for immobilization of papain. To increase the interaction between the support with papain, the poly (methacrylic acid) is grafted onto chitosan/clay composite spheres. Papain was immobilized onto poly (methacrylic acid) grafted chitosan/clay via adsorption. Finally, papain immobilized polymer-modified composite spheres were used as adsorbent for heavy metal removal from aqueous solution.

Acknowledgements: This work was supported by the Research Fund of Kirikkale University (2015/46).

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Keywords: mercury removal, chitosan, clay, papain

P-267

BIOSORPTION CAPABILITY OF *ISATIS TINCTORIA* FOR THE REMOVAL OF Pb(II) AND Cd(II) IONS

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Heavy metals are used in many industries e.g. automotive, battery, coating, dye and agriculture. Despite of their importance for economic growth in most countries, they accumulate in living organisms and cause the health problems even death due to their toxic effects. For this purpose, many physical-chemical methods can be used [1]. Biosorption is one of the most respective methods that it has been successfully applied for Pb(II) and Cd(II) ions removal from wastewater due to its low cost, ease of operation and high efficiency [2].

In this study, *Isatis tinctoria* (*I. tinctoria*) was used to remove Pb(II) and Cd(II) ions from aqueous solution. The biosorption of Pb(II) and Cd(II) ions onto *I. tinctoria* was investigated as a function of initial pH and biosorbent dosage in a batch system. The interactions between metal ions and functional groups of *I. tinctoria* were confirmed by FTIR, SEM and EDX analysis. The results showed that the maximum biosorption amounts of Pb(II) and Cd(II) ions were obtained at pH 5.5 and 7.5, respectively. The optimum biosorbent dosages for removal of Pb(II) and Cd(II) ions were also found as 1.6 g L^{-1} and 1 g L^{-1}, respectively.

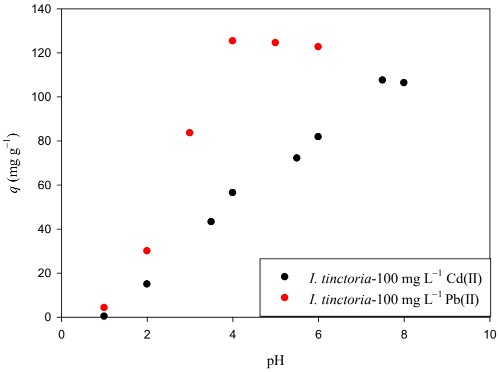

Figure 1: Effect of pH on the biosorption of Pb(II) and Cd(II) ions onto *I. tinctoria*

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Keywords: ,Biosorbent, Biosorption, Heavy metal

P-268

INVESTIGATION OF BIOACCUMULATION EFFICIENCY OF TURKISH TOBACCOS BY EVALUATING THEIR HEAVY METAL CONTENTS IN ELATION TO THEIR ORIGIN

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Long term exposure to HMs or exposure to high concentrations of HMs such as Mercury (Hg), Arsenic (As), Cadmium (Cd), Copper (Cu), Lead (Pb), Nickel (Ni), and Zinc (Zn), which are considered to be the most problematic ones regarding their toxicities, can cause severe environmental problems and deleterious health effects in humans [1]. Effectiveness and efficiency of exploiting tobacco for bioremediation is examined for cadmium, copper, manganese and zinc. The concentrations of these HMs were determined both in the tobacco plants and soil samples. The collected samples were digested via wet ashing technique by using HNO_3-$HClO_4$ for plant samples and HF-$HClO_4$ for soil samples. All samples were analyzed by flame atomic absorption spectrometry. The regression coefficients were above 0.99 and the detection limits were in the range of 0.03-0.12 mg.L^{-1}. The performance and accuracy of the method was tested. The determined values were in agreement with the standard values for the heavy metals analyzed. Bioconcentration factors (BCFs) were calculated. It was found that tobacco plants from cities on the Mediterranean and the Aegean regions had the highest concentration of HMs and BCFs. It was concluded that the characteristics of the soils the tobacco plants are raised influence the metal uptake capacity of the plants, but tobacco can be used as good bioaccumulator for HMs.

Acknowledgments: Authors would like to acknowledge Ege University and Emür Henden and F. Okcu Pelit for their support.

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Keywords: Tobacco, bioaccumulation, heavy metal

P-269

DETERMINATION OF CAFFEINE IN DIFFERENT BRANDS OF COFFEE BY ULTRA HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

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Caffeine (1,3,7-trimethylxanthine) is an alkaloid that occurs naturally in coffee. It is the most widely consumed and studied psychoactive substance in history, but the general conclusions on its effects on human health are still controversial. Increased alertness and learning capacity and better exercise performance have been cited as some of the positive effects of low to moderate caffeine intake. While some studies have associated caffeine intake with high blood cholesterol, coronary diseases, and cancer [1]. Nonetheless, excessive caffeine intake has been associated with a wide variety of health problems, including anxiety, tachycardia, insomnia (sleep disorders), headaches, gastric defects, diuresis and an increased risk of osteoporosis after menopause. Furthermore, its excessive consumption by pregnant women can give rise to spontaneous miscarriages or low birth weight of the babies [2]. Caffeine is a natural alkaloid found in more than 60 plants including coffee beans, tea leaves, cola nuts, and cocoa pods. Its concentration varies depending on the type of product, agronomic and environmental factors, and processing [3]. Coffee is one of the most consumed beverages in the world. There are numerous preparations of coffee, such as percolation, filtration, boiling, instant, espresso, etc., each of which will extract different amounts of caffeine per gram of coffee bean. The aim of this study was determination of caffeine in different types of coffee samples which consumed frequently in our country collected from the Bursa market using an UPLC. The caffeine levels in coffee extracts were found to range from 864 - 37863 mg/kg.

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Keywords: Caffeine, Coffee, UPLC

P-270

SYNTHESIS OF NEWLY HALOHYDRIN AND HALOLACTONE DERIVATIVES

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Halolactone, chlorohydrins and other halohydrins are an important class for organic chemistry and are useful intermediates for the synthesis of biologically active natural and synthetic products [1,2]. Especially, vic-halohydrins have found widespread application in organic synthesis. They are key intermediates in the synthesis of several halogenated marine natural products1and also in various useful synthetic transformations. These halo derivatives are widely applicable in industrial processes for the synthesis of drugs, pharmaceuticals, agrochemicals, pigments and photographic materials [3,4]. Bicyclic ring systems, halolactone and haloketone derivatives play an important role on biological profile, because of strong antibiotic, antihelmintic, antifungal, antitumor, antiviral, antiinflammatory and cytostatic properties [5]. These important properties makes significant to bicyclic ring systems for synthesis of new drugs.

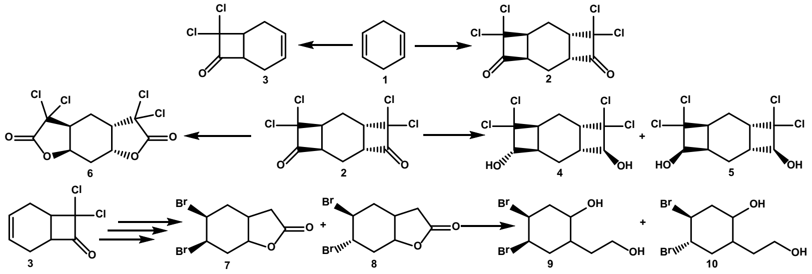

Figure 1: Synhesis of halohydrin and halolactone derivatives

Mono-addition [6] **(3)** and *di*-addition **(2)** products (synthesis of *di*-addition products is not available in the literature) were prepared by the addition of dichloroketene to cylohexa-1,4-diene **1** in two-neck round bottom flask with a nitrogen inlet for 20 hours. *di*-addition products **2** were separately reacted with $LiAlH_4$ and H_2O_2. Halolactone **(6)** and halohydrin **(4 and 5)** derivatives which is likely to exhibit biological activity were obtained at the end of the reactions. Then the elimination of the chlorine for *mono*-addition product **3** was accomplished by using zinc in refluxed acetic acid at 100 °C for 24 hours. After that 3,4-dibromobicyclo[4.2.0]octane-7-on was obtained in cyclohexane/Br_2 for 30 minutes. Then the oxidation of *cis*-, *trans*-3,4-dibromobicyclo[4.2.0]octane-7-on with H_2O_2 and acetic acid produced the lactone *cis*- **(7)** and *trans*-5,6-dibromo-hexahydroisobenzofurane-2(3H)-on **(8)**. Halolactone products **7** and **8** were reacted with $LiAlH_4$ and we synthesized halohydrin **9** and **10**. Then we investigated of antibiotic and cytotoxic effects which all synthesized molecules.

Acknowledgements: The authors are indebted to Mersin University (BAP-FBE KA (ÖY) 2014-1DR, BAP-FBE K (EYB) 2011-7 YL) and BAP 2015-AP4-1235) for its financial support of this work.

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Keywords: halohydrin, halolactone, ketene addition reaction, biologically active molecules

P-271

SYNTHESIS OF 6-AMINOURACIL BASED ANTIMETABOLITES AND STUDY ON THEIR INTERACTION

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Antimetabolites are a class of chemicals which has biological activity and behaviors to inthibit another chemical reactions and synthesis in normal metabolic system. The presence of antimetabolites may have a toxic effect for the cells, such anti cell growth and division on cell activity. Herein these compounds are used to be treated to cancer and targeting human immunodeficiency virus (HIV) as becoming a chemotherapeutic agent [1].

Antimetabolites may readily become incorporated like binding to purine and pyrimidinenucleotides in DNA or RNA such as 5-fluorouracil (5-FU). This kind of antagonist molecules interact with some biomolecules which have a role on DNA formation and lead the cell to apoptosis [2,3,4].

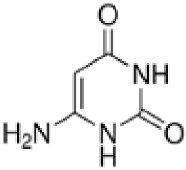
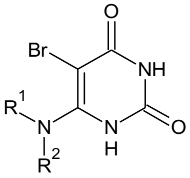
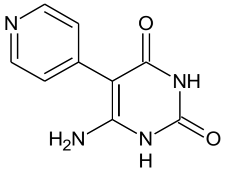
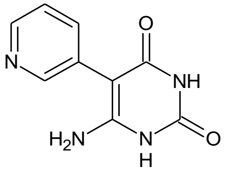


Figure 1: Scheme of 6-Aminouracil

In our research, we synthesized some of 6-aminouracil derivatives and studied their interactions with cisplatin, transplatin, purine and pyrimidine bases and nucleotides. We still have a research which is based on total DNA interaction in several different alives cell culture.







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Keywords: Uracil, Cancer, Antimetabolite, DNA, RNA

P-272

THE SYNTHESIS OF BENZOFURANONE AND INDOLE DERIVATIVES AND EXAMINATION OF THEIR CYTOTOXIC AND ANTICARCINOGENIC EFFECTS ON NIH 3T3 AND MCF7 CELLS

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The benzofuranone ring structures are important structural units in many natural products, e.g. furocoumarins and furanoquinoline alkoloids (1). Benzofuranone derivatives are also used as a precursor compound for the synthesis of 4-hydroxyindol, which is a key intermediate for the synthesis of an arhytmic agent Pindolol(2).

Benzofuranone and indole derivatives are used as drug precursors and intermediates with identified positive effects on human health. sees an increasing interest in the pharmaceutical industry.

Some of the most recent benzofuran containing drugs are Amiadrone, Angelicin xanthotoxin, Bergapten, Azimilide, Geiparvarin, Roseophilin (3, 4) and some of the indol-containing drugs are Pindolol, Ziprasidon, Etodolak, Mitomisin and İndometazin (5).

Due to the the biological activity, benzofuranone and indole derivatives have great importance in pharmaceutical industry. This led us to obtain target compound and synthesizing the novel indole and benzofuranone derivatives and examine biological activity by using cell culture study.

For this purpose indole and benzofuranone derivatives are obtained using a simple and selective method and then using a catalyst such as manganese (III) acetate, acetoxylation reaction with regioselectification path is performed followed by enzymatic resolution based on our previous work(6). Then new derivatives of benzofuranone and indoles are examined via various cell culture studies.

At cell culture studies cell proliferation, cytotoxic and anticarcinogenic effects of obtained racemic and enantiopure benzofuranon and indole derivatives are determined by reductive cleavage of MTT to formazan by mitochondrial dehydrogenase using NIH 3T3 mouse fibroblast cells and MCF7 human breast adenocarcinoma cells (7). Morphological effects of indole, benzofuranon derivatives on NIH 3T3 and MCF7 human breast adenocarcinoma cells are observed using inverted flouresence microscope(8).

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Keywords: benzofuranone, indole, cell culture

P-273

SCREENING AND CHARACTERIZATION OF LIPASE FROM *BACILLUS* SPECIES ISOLATED FROM SALTED SHEEP SKINS

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Lipases (triacylglycerol acylhydrolases, EC 3.1.1.3) belong to the hydrolase family of enzymes. They hydrolyze triacylglycerides into fatty acids and glycerol on an oil-water interface. Additionally they can catalyze esterification, interesterification, and transesterification of fatty acids [1, 2]. Lipases are of great interest for different industrial applications due to their diversity and versatility. Therefore, lipases are used vastly in various industrial processes in pharmaceutical, detergent, cosmetic, food, textile, pulp and paper and leather industries [3]. Among different lipases, microbial lipases are preferable due to their broad substrate specificity, and higher stability with lower production costs compared to the lipases from plants and animals. Members of genus *Bacillus* which are ubiquitous are known to produce a wide range of enzymes that have potential industrial applications. In addition, rapid growth and low level of toxic by-products are the other advantages of these microorganisms. Among the bacterial strains, *Bacillus* species being capable of growing in large scale culture are taxonomically very diverse and are the most popular source of commercial enzymes. They can grow optimally in media containing 3–15% NaCl. Numerous *Bacillus* species from many different environments have been screened for lipase production and more screening studies are needed for obtaining enzymes with better lipolytic activity and stability at high pH and temperature [4]. *Bacillus siamensis, Bacillus tequilensis, Bacillus licheniformis, Bacillus safensis* and *Bacillus pumilus* which were isolated from salted sheep skins were used as test strains in the present study. These strains were identified using phenotypic and genotypic analysis in our previous study [5]. Moreover, besides conventional substrates due to low cost and lipid contents, some of the industrial plant oils and agricultural industial wastes such as olive oil, glycerol, waste water and glycerol from an olive oil processesing company were used as substrates. The lipase activities increased exponentially consistent with time. All strains were good lipase producers but, *B. safensis* had the highest lipase activity when nut oil was used as substrate. Lipase from *B. Safensis* was further purified and characterized and conditions for maximum enzyme production were optimized.

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Keywords: Lipase, Bacillus, B. safensis

P-274

ENZYMATIC SYNTHESIS OF ALCOHOLS AND KETONES CATALYZED BY AN ALCOHOL DEHYDROGENASE FROM *BACILLUS THURINGIENSIS SEROVAR ISRAELENSIS*, AN EFFICIENT, GREEN, AND ECONOMIC BIOCATALYST FOR INDUSTRY

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The use of enzymes in industry has increased during the last years. Enzymes provide high substrate specificity, high selectivity, no byproducts, and mild reaction conditions. These are the major reasons why synthetic chemists have become interested in biocatalysis. This interest is mainly due to the need to synthesise enantiopure compounds as chiral building blocks for pharmaceuticals and agrochemicals. Enzymatic oxidation of alcohols and reduction of ketones and aldehyde afford fine chemicals and pharmaceutical intermediates in an environmentally benign manner [1]. (Figure 1).

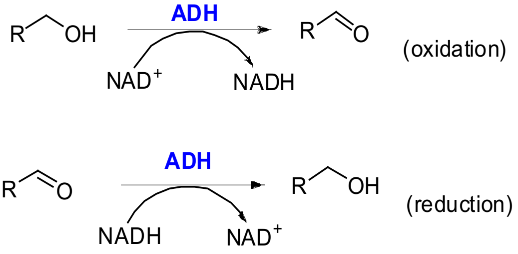

Figure 1. Schematic presentation of ADH catalysed reaction

One of the most challenging drawbacks of using biocatalysts in industry is the weak stability of enzymes. They are highly responsive to changes in physical and chemical conditions. They are easily denatured by even a small increase in temperature and pH. Furthermore, they are highly susceptible to presence of other chemicals. To avoid the high cost of preparing enzyme for each reaction which is not adequate for industry in terms of economy, immobilizing enzyme seems to be an efficient solution as it provides multiple, the ability to stop the reaction rapidly by removing the enzyme from the reaction solution, more stability, and non contaminated products [2].

An ADH from *Bacillus thuringiensis serovar israelensis* was utilized in both soluble and immobilized form. The conversion of alcohols, ketones and Aldehydes was confirmed by using the enzyme soluble form. During this study, the immobilization process will be optimized for more efficient synthesis and further analysis by GC-MS will be carried out to verify the generation of the reaction product.

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Keywords: Enzymatic, Alcohols, Enzyme Immobilization,Green Synthesis

P-276

SYNTHESIS AND CHARACTERIZATION OF NEW BIOLABEL WITH PROPIOPHENONE

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In general, the low intensities and quantum efficiencies of lanthanide luminescence in solution makes luminescence techniques difficult. To a large extent these disadvantages may be overcome by utilizing energy transfer to enhance the lanthanide luminescence. In this case intense luminescence originates from the transfer of energy from an excited state of an organic ligand to the emitting state of the Ln (III) ion. In order for efficient sensitized emission to occur, several requirements must be fulfilled. The chelate must effectively shield the Ln (III) ion from non-radiative decay processes such as coupling to the high energy vibrational modes of solvent molecules. The ligands should possess one or more chromophores with high molar extinction coefficients ($\varepsilon > 10\,000$) and these chromophores must be able to effectively transfer energy into the Ln (III) ion excited states. In addition, the Ln(III) chelate should be thermodynamically stable, kinetically inert on the luminescent time scale, and soluble in aqueous systems [1].

The organic ligands in biolabel molecules antenna acts. The aim is to collect the light organic molecules in the ultraviolet region. The collected light is transmitted to the energy band of the Europium (III) ion $^5D_0$ induced in various ways. The success of this energy transfer means of the high quantum yield. Higher quantum efficiency of the molecule the Europium (III) ions is required not to bond with water.

In this study were synthesized a biolabel compound (PPD) using diethyloctafluoroadipate and 2-acetylfluoren. Elemental, ^{1}H-nmr, ^{13}C-nmr and FT-IR spectroscopic study have been performed to characterize the compound.

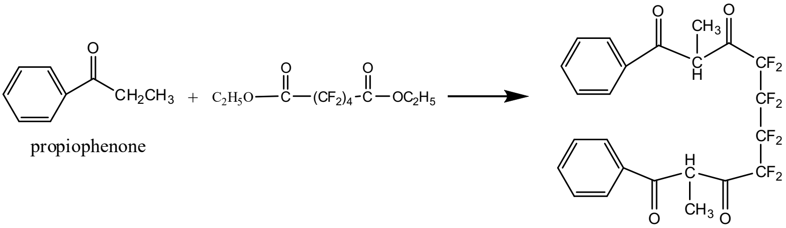

Figure 1: Synthesis scheme of PPD

Acknowledgements: This work is supported by TUBITAK 214Z093

References:

[1] Chopin, G.R; Peterman, D.R. Coordination Chemistry Reviews, **1998**, 174, 283-299

Keywords: propiophenone, ligand-sensitized, luminescence

P-277

SYNTHESIS AND CHARACTERIZATION OF NEW BIOLABEL WITH 1-ACETYLPYRENE

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The luminescence of the lanthanide ions spreads from the UV spectral range up to the NIR, and many lanthanide ions have unique spectral characteristics in the visible region of the spectrum, which also give them distinctive luminescent colors. A lot of applications take advantage of those characteristic emissions for color reproduction and lighting. Phosphors, nanomaterials made of lanthanide complexes or enclosing lanthanide compounds, as well as LEDs based on lanthanide complexes are extensively investigated [1].

Europium is certainly the most versatile lanthanide. Its luminescence can be used to reproduce blue ($BaMgAl_{10}O_{17}$: Eu^{2+}), green ($SrGa_2S_4$: Eu^{2+}), or red (any sensitized Eu^{3+} complex). Europium is a special element that makes the electronic transition $^5D_0$-$^7F_2$. In fact, this transition is banned Laporte. Nevertheless it has a strong emission intensity. In the ultraviolet region 300-330 nm wavelength when excited atvisible region 615-620 nm gives a sharp peak in the phosphorescence. Europium metal with organic compounds can be sensitized. This organic compounds is called light harvesting molecules, which means that collected light into.

In this study were synthesized a biolabel compound (1-APD) using diethyloctafluoroadipate and 9-acetylantharacene. Elemental, ^{1}H-nmr, ^{13}C-nmr and FT-IR spectroscopic study have been performed to characterize the compound.

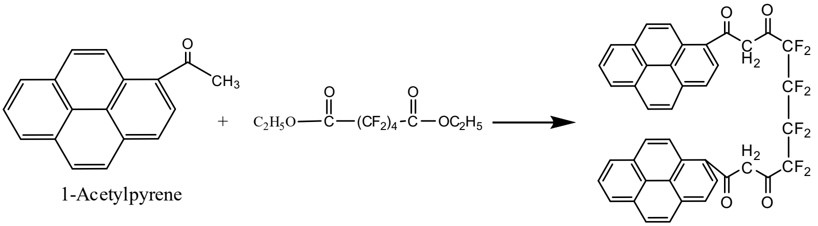

Figure 1: Synthesis scheme of 1-APD

Acknowledgements: This work is supported by TUBITAK 214Z093

References:

[1] Wang, G; Yuan, J; Matsumoto, K; Hu, Z. Analytical Biochemistry **2001**, 299, 169-172.

Keywords: 1-acetylpyrene, biolabel, Europium(III)

P-278

SYNTHESIS AND CHARACTERIZATION OF NEW BIOLABEL Eu (III) COMPLEXES

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The health field has been declarated that the priority field in Higher Committee of Science and Technology in January 2013. It has been announced that the most needed item of health field is synthesizing and producing own molecules. Unfortunately the clinical chemistry field has not been developing enough in our country. Therefore it is said that our country is not in good place due to our privated medicine, apparatus or production of new molecules. Since many years number of complex compound have been used for measurement of biomolecules in human blood in bioengineering field. This kind measurement is call as **immunoassay**. The compounds used in this field are also call **biolabels**.

One way of assaying biomolecules based on fluorescence with biolabels by using fluoroimmunoassay technique. When we examine the literature, there are no scientific publications on the synthesis of fluorescent molecules used as biolabel addressing our country. However, there are numerous publications concerning the fluorescence molecules as biolabelling used in the field of clinical chemistry. On the other hand, the studies with fluorescence Eu(III) complexes based on β-diketonate are limited. The ligands based on β-diketonate being used as a biolabel are preferred for enhancing fluorescence sensitivity of the Eu(III) complexes. The reason of using Eu(III) ions in the synthesis of these complexes is due to give a special phosphorescence emission of ions. The most important advantages of Eu(III) complex compared with organic phosphorescence compounds are long-Stokes shift, so that the background phosphorescence is prevented, long lifetime of excited states up to the milliseconds, when stimulated in the UV region, hyper transition is defined as narrow and sharp emission band is observed in the visible region as listed.

In this study were synthesized a biolabel compound (2AF) using diethyloctafluoroadipate and 2-acetylfluoren. Elemental, 1H-nmr, 13C-nmr and FT-IR spectroscopic study have been performed to characterize the compound.

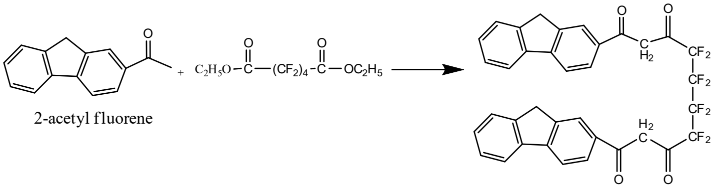

Figure 1: Synthesis scheme of 2AF

Acknowledgements: This work is supported by TUBITAK 214Z093

References:

[1] Yuan, J; Matsumoto, K. Analytical Sciences **1996**, 12, 695-699

Keywords: Biolabel, Europium(III), immunoassay

P-279

SYNTHESIS AND CHARACTERIZATION OF NEW BIOLABEL WITH 9-ACETYLANTHRACENE

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The health field has been declared that the priority field in Higher Committee of Science and Technology in January 2013. It has been announced that the most needed item of health field is synthesizing and producing own molecules. Unfortunately the clinical chemistry field has not been developing enough in our country. Therefore it is said that our country is not in good place due to our privated medicine, apparatus or production of new molecules. Since many years number of complex compound have been used for measurement of biomolecules in human blood in bioengineering field. This kind measurement is call as immunoassay. The compounds used in this field are also call biolabels.

The synthesis of biolabel compounds in the many organic starting materials can be used. In these compounds, pyridinedicarboxylic acids, cryptands and β-diketonates are the most common. The preparation of these compounds organic synthesis and purification methods used. Unsurprisingly this process are the long-term process that requires a lot of labor. Some reactions are able to take up to nine or ten digits. It requires strenuous work-up and purification procedures. For this reason, we preferred for the less β-diketonate contains synthesis steps in this study.

In this study were synthesized a biolabel compound (9-AAD) using diethyloctafluoroadipate and 9-acetylantharacene. Elemental, ^{1}H-NMR, ^{13}C-NMR and FT-IR spectroscopic study have been performed to characterize the compound.

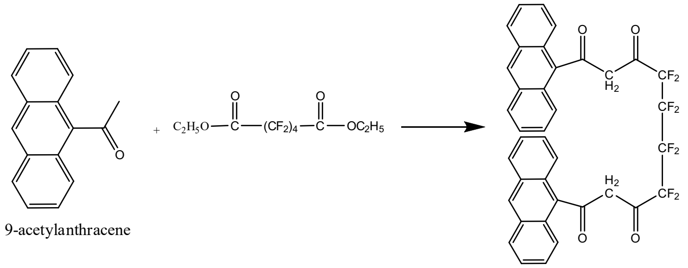

Figure 1: Synthesis scheme of 9-AAD

Acknowledgements: This work is supported by TUBITAK 214Z093

References:

[1] Yuan, J; Matsumoto, K. Analytical Sciences **1996**, 12, 695-699

Keywords: diethyloctafluoroadipat, 9-acetylanthracene, biolabel

P-281

G3 PAMAM DENDRIMER-miRNA POLYPLEX FORMATION: COMPUTATIONAL AND EXPERIMENTAL APPROACH

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MicroRNAs (miRNAs) are 18-25 bp small regulatory RNAs. Although some exceptions are possible, miRNAs regulate gene expression post-transcriptionally through a translational repression and/or mRNA degradation [1]. With these characteristics, miRNAs are effective tools that can be used in genetic engineering applications. However, cell transfection method(s) will be used in this process has importance. Dendrimers are nano-sized, radially symmetric molecules with well-defined, homogeneous, and monodisperse branched structures. Dendrimers can be synthesized step by step and this makes it possible to precisely design and control their molecular structure [2]. Also, PAMAM dendrimers show a strong binding affinity for DNA/RNA molecules. Therefore, cationic polyamidoamine dendrimers are among the widely used chemical transfection methods.

In this work, the interaction between G3-PAMAM dendrimer and miRNA was investigated by using molecular simulation approaches and experimental studies. In the context of molecular simulation approaches, electronic calculations of the dendrimer and molecular docking calculations of the dendrimer-miRNA complexes were computed. In experimental studies, PAMAM/miRNA complex formation at different w/w ratios was examined by gel retardation assay and zeta potential and particle size measurements were done for polyplex characterization. Then, transfection efficiencies of the PAMAM/miRNA polyplexes at the determined w/w ratios were evaluated at the MRC-5 (Medical Research Council 5) cell line by flow cytometry method.

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Keywords: Dendrimer, miRNA, Polyplex

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SYNTHESIS OF AMINO ACID LINKED CRYOGELS AND BIOLOGICAL APPLICATIONS

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Cryogel quite preferred as synthetic materials in recent years has emerged [1]. Adsorbents are used in the batch and continuous system operation [2,3]. In this study poly(2-hydroxyethyl methacrylate@N-methacryloyl-L-lysine) poly(HEMA@MAL) cryogels synthesized and used in adsorption from aqueous systems of L-aspartic acid. The adsorption of aspartic acid with the cryogels was tested under changing conditions of pH, interaction time, initial aspartic acid concentration, temperature, and ionic strength. For the characterization of cryogels; swelling test, Fourier transform infrared (FT-IR) spectroscopy, scanning electron microscopy (SEM), surface area (BET), elemental analysis were performed. The adsorption capacity of cryogels was determined about 236 mg aspartic acid/g cryogel. Adsorption of lysozyme was studied under the optimum adsorption conditions and adsorption capacity of cryogels was found as 37.25 mg enzyme/g cryogel. The adsorption process was triad via Langmuir and Freundlich isotherm models and the Langmuir adsorption model was determined to be more appropriate for the aspartic acid adsorption onto cryogels.

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Keywords: Adsorption, amino acid, aspartic acid, cryogel.

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SAFFRON (*CROCUS SATIVUS* L.) AND ITS ACTIVE CONSTITUENT: SAFRANAL

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Crocus sativus L,. commonly known as saffron is a stemless herb of the Iridaceae family and it has been broadly used in folk medicine. [Figure 1]. Studies have demonstrated that C. sativus L. and its active constituent, safranal, have antioxidant, genoprotective, bronchodilatory, cytotoxic , antitussive, anticonvulsant, antinociceptive, neuroprotective, antiabsence , antidepressant, hypotensive , anxiolytic and hypnotic effects [1]. Saffron includes more than 150 chemicals agents. When saffron is dried after its harvest, the heat, combined with enzymatic action, splits picrocrocin to yield D–glucose and a free safranal molecule[2 Pharmacologically active and characteristic components of saffron are safranal (gives saffron much of its distinctive aroma.), picrocrocin- (is the chemical most responsible for the taste of saffron), and crocin (saffron's golden yellow-orange colour is primarily the result of a-crocin.) [Figure 2] [3]. These constituents of saffron have all confirmed health promoting properties. Safranal a monoterpen aldehyde which is the deglycosylated form of picrocrocin and a great antioxidant that fights oxidative stress in neurons. Safranal is thought to play a key job in the observed biological activities of saffron. [4].

Figure 1: Saffron

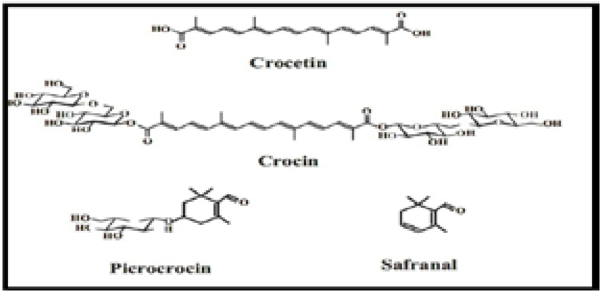

Figure 2: Structures of the chemical constituents of safronn

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Keywords: Saffron, Crocus sativus L, SAFRANAL

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4D-QSAR STUDYING WITH MCET METHOD ON TRYPSIN-LIKE SERINE PROTEASE INHIBITORS

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Trypsin-like serine protease plays the central role in a wide range of biological processes and the up regulation of the members of this superfamily is therefore an attractive target for the development of potential therapeutic agents [1]. QSAR (Quantitative Structure Activity Relationship) estimates the pharmacological, toxicological and biological activity of a molecule quantitatively. This method is based on the structure and activity information arising from a similar series of compounds [2]. Indole/benzimidazole-5-carboxamides originates from a series of derivative literature [3] and 4D-QSAR (four-dimensional-Quantitative Structure Activity Relationship) [4] MCET (Electronic Topological Methods of Molecular Conformers) is examined .

The aim of the study is to estimate the biological activity and bring out the bio-structure which consists of pharmacophore (Pha), auxiliary groups (AG) and anti-pharmacophore shielding (APS) groups. This method provides the advantages not only to understand the indole/benzimidazole-5-carboxamides biological interaction model but also to estimate their activities. Taking account of the steric and electrostatic effects of the compounds, inhibition of the activity is estimated by 4D-QSAR model. 29 molecules in the training set and 10 molecules in the test set were determined with their cross-premise power coefficient (Q^2) and predictive correlation coefficient (R^2) values.

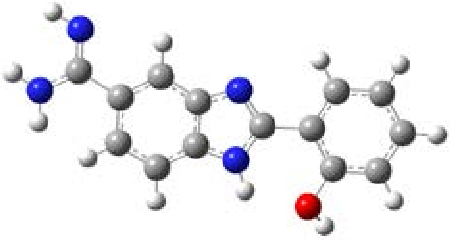

Figure 1: Three dimensional structure of reference molecule

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Keywords: 4D-QSAR, Indole/benzoimidazole-5-carboxamidines, MCET, Pharmacophore

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