



ICINSE

BOOK OF ABSTRACTS

VOLUME 1

1ST INTERNATIONAL CONFERENCE ON INNOVATIONS IN NATURAL SCIENCE AND ENGINEERING

ICINSE 2018

3 - 6 JANUARY 2018

*Kaya Artemis Convention Center
Famagusta, Turkish Republic of Northern Cyprus*

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VOLUME 1**

**1ST INTERNATIONAL CONFERENCE
ON INNOVATIONS IN
NATURAL SCIENCE AND ENGINEERING
(ICINSE 2018)**

3 - 6 January 2018

**Kaya Artemis Convention Center
Famagusta, Turkish Republic of Northern Cyprus**

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Zekai TARAKÇI, Ordu University, Turkey

11.01.2018

**Conference
Chair**

Prof. Dr.
Mustafa Soylak

Dear Colleagues,

The Scientific Committee is pleased to announced that the "1st International Conference on Innovations in Natural Science and Engineering (ICINSE 2018)" which was taken place in Turkish Republic of Northern Cyprus between 03 - 06 January 2018, was held in such a beautiful city and wonderful country to which we have many historical relations. North Cyprus is a place full of magic: fully deserving the title of "Pearl of the Mediterranean". It is a rich and colourful tapestry of unspoilt beauty, ranging from sparkling clear waters and golden beaches to fields carpeted by wild flowers in the Spring and the pine clad heights of the Besparmak Mountains.

We wish that this conferece opens new doors to new projects and new relations. In this respect, we desired that the scientists all around the world come here, meet and creat new projects together. The scientist attended the conference was from 8 diffent contry and mostly from Turkey. Total 64 scientist, educater, industrialist and from other fields were registrated in the conference. The total number of submission were 154 and 90 of them were accepted as oral presentation and 42 of them were accepted as poster presentation and abstract part of all those presentation was taken place in the conference abstracts books.

Kind regards,

On behalf of Organizing Committee,

ICINSE2018

3 - 6 January 2018

Kaya Artemis Convention Center
Famagusta, Turkish Republic of
Northern Cyprus

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KEYNOTE SPEAKERS



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Turkey



Surkay AKBAROV
Yıldız Technical University
Turkey



Yunus Ali ÇENGEL
University of Nevada, Reno
United States



İbrahim İŞILDAK
Yıldız Technical University
Turkey



Mehmet Hakkı ALMA
İğdır University
Turkey

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INVITED SPEAKERS



Ramazan ERENLER
Gaziosmanpaşa University
Turkey



Rashid AHMAD
University of Malakand
Pakistan



Samir SHARIFF
Taibah University
Kingdom of Saudi Arabia



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Weizmann Institute Of Science
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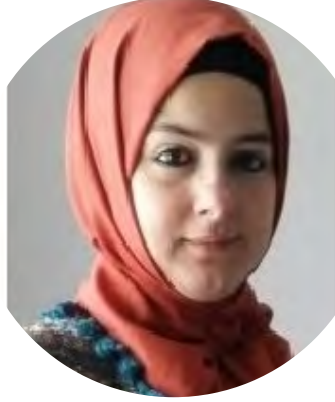
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Ayhan HORUZ
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Zekai TARAKÇI
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Faik GÖKALP
Kırıkkale University
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Halil İbrahim DEMİR
Sakarya University
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Mikdat ŞİMŞEK
Dicle University
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İbrahim Halil BAYDİLEK
İğdır University
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1st International Conference on Innovations in Natural Science and Engineering (ICINSE 2018)



Conference Program

3 January 2018 (Wednesday)

TIME	Entrance Hall
14:00-18:00	Registration
18:00-20:00	Welcome Cocktail

4 January 2018 (Thursday)

TIME	Hall-A	Hall-B	Hall-C
9:00-10:00	Registration		
10:00-10:15	Opening Ceremony Ahmet TUTAR, Mustafa SOYLAK		
10:15-11:00	Opening Course - Zekai ŞEN Importance of Geometric Vision for Innovative Ideas in Science and Engineering		
11:00-11:30	<i>Coffee Break - I</i>		
	Scientific Section – A - I (Chair: Zekai ŞEN)	Scientific Section – B - I (Chair: Ramazan ERENLER)	Scientific Section – C - I (Chair: Ibrahim IŞILDAK)
11:30 - 11:45	Yunus CENGEL Paradigm Shift in the Definition of 'Domestic': A Global Perspective	Ramazan ERENLER Natural Products in Medicine	Kemal ERMIS Thermo-Economic Comparison Of Geothermal Cooling Systems With Conventional Systems
11:45 - 12:00			İhsan KÜÇÜKRENDECI Effect Of Boundary Conditions On Forced Vibrations Of Laminated Composite Plates Of Supported By Springs
12:00 - 12:15	Surkay AKBAROV Mahemathical Modelling And Theoretical Study On The Tunnel+Soil Systems	Hacali NECEFOĞLU Synthesis, Characterization and Computational Studies of N'-(4-carboxybenzylidene) nicotinohydrazide	Nazmiye YAHNIOGLU Free Vibration Of A Fluid-Filled Hollow Sphere With Inhomogeneous Initial Stress
12:15 - 12:30			Nazmiye YAHNIOGLU Buckling delamination of a PZT/Metal/PZT sandwich rectangular thick plate with closed-circuit conditions
12:30 - 12:45	Elman HAZAR Separation of Emulsion Water from Petroleum and Protection of Naphtha Well from water currents	Aynur MANZAK Extraction of Humic Substances from Leonardite with Polymer Inclusion Membranes	Olusola BAMISILE Application Of Solar Absorption Refrigeration Systems In Nothern Nigerian
12:45 - 13:00		Özge Şakıyan DEMIRKOL Infrared-microwave Combination Baking Of Gluten-free Cakes: An Optimization Study	Harrison TIGHIRI Computational Fluid Dynamics and its Applications in Microalgae Bioreactor Technology: A Review
13:00-14:00	<i>Lunch</i>		

	Scientific Section – A - II (Chair: Yunus CENGEL)	Scientific Section – B - II (Chair: Omer ISILDAK)	Scientific Section – C - II (Chair: Arye TISHBEE)
14:00 - 14:15	Ibrahim IŞILDAK Sensör ve Biyosensörlerin Biyoteknolojik Uygulamaları	Omer ISILDAK Development of Potentiometric Sensors and Investigation of Behavior	Elif ÇATIKKAŞ The Investigation Of Geometric And Electronic Parameters Of The Essential Oil Of Capparis Spinosa L. By Using Dft
14:15 - 14:30			Elif ÇATIKKAŞ Determination of Structural And Electronic Parameters Of The Essential Oil Of A Ocimum Basilicum L. by Using Dft Method
14:30 - 14:45	Mustafa ERSOZ Nanoenhanced membranes by incorporation of MWCNTs and TiO ₂ for water treatment	Murat TEKER The Effect Of Accelerators On Vulcanization Of Different Rubber Compounds	Duygu ULAŞ The Curves Of Parameters Having Economic Importance In Conventional Milk During Winter And Spring Season
14:45 - 15:00	Serpil EDEBALI Chitosan Containing Microcapsules For The Adsorption Of Cr(VI) Ions		Mehmet BASBAG Evaluation of Some Concentrate Feedstuffs for Nutrient Contents, Metabolizable Energy Levels and Relative Feed Values
15:00 - 15:15	Esra ALTINTIĞ Multi element determination in some herbal teas from Turkey by ICP-OES	Murat TEKER A Investigation Of Kinetics Of Dyeing Polyester Fibers In Microwave Media	Metin KONUS Antioxidant, Antibacterial, Antifungal And Cytotoxic Properties Of Synthesized Benzaldehydes
15:15 - 15:30	Burcu SÖMÜRK YILMAZ Synthesis of copper ion incorporated uricase-based hybrid nanoflowers and their enhanced catalytic properties	Mustafa FENER Relationship Between Basic Index Properties Of Stone And Capillarity Values	Gulsin ARSLAN Magnetite loaded chitinous microcages produced from microcrustacean (<i>Daphnia longispina</i> water flea) ephippia for Cr(VI) removal
15:30-16:00	<i>Coffee Break - II</i>		
	Scientific Section – A - III (Chair: Surkay AKBAROV)	Scientific Section – B - III (Chair: Hacer BAYRAK)	Scientific Section – C - III (Chair: Faik GÖKALP)
16:00 - 16:15	Arye TISHBEE A specific metabolome study of plant parts, tissue, organ and cell, employing UPLC-QTOF Mass Spectrometry and dedicated library, in search of valuable plant metabolites	Hacer BAYRAK Synthesis of New Hybrid Molecules Containing β -Lactam Ring, and Screening for their Antimicrobial, Antioxidant, Anti Ureas & Acetylcholinesterase Activities	Faik GÖKALP Kuşburnu (<i>Rosa canina</i> L.) içindeki etken bileşiklerin kimyasal aktivitelerine teoriksel yaklaşım Theoretical approach to the chemical activities of the active compounds in rosehip (<i>Rosa canina</i> L.)
16:15 - 16:30			
16:30 - 16:45	Ayhan HORUZ Copper and Humic Acid Interaction in Cucumber (<i>Cucumis sativus</i> L.) Plant	Ayşe KAÇAR Usability of Waste Paper as Additive Materials in Mortars	Halil İ DEMİR Solving Process Planning, WMS Dispatching, and WPPW Weighted Due-Date Assignment Simultaneously Using Random-Genetic-Hybrid Search
16:45 - 17:00		Ayşe KAÇAR Investigation Of The Use Of Propolis As A Filler Material In Concrete Cracks	
17:00 - 17:15	Salih Zeki YILDIZ The Investigation of Using of Sodium Chlorite (NaClO ₂) in The Treatment of Textile Wastewater	Özlem TERZİ Drought Estimation of Çanakkale by Gene Expression Programming	Halil İ DEMİR Integrated Process Planning and WSPT Weighted Scheduling with WPPW Weighted Due-Date Assignment Using Genetic and Hybrid Searches
17:15 - 17:30	Murat TUNA Metal-containing polymer obtained by using several Schiff base metal complexes and catalytic properties	Serpil EDEBALI Preparation of chitosan-damson plum kernel shell (C-DPKS) and alginate-damson plum kernel shell (A-DPKS) nanocomposite materials and these investigate of adsorption capability for Chromium(VI)	Abdullah H. KÖKÇAM Hospital Location Selection using TOPSIS and Fuzzy AHP
17:30-18:15	Mustafa ERSOZ COST projects and International Networking		
17:30 - 19:00	Poster Presentation – I (Chair: Murat TUNA)		

TIME	Hall-A	Hall-B	Hall-C
	Scientific Section – A - IV (Chair: Etibar ISMAILOV)	Scientific Section – B - IV (Chair: Hacali NECEFOĞLU)	Scientific Section – C - IV (Chair: Mehmet Hakkı ALMA)
09:30 - 09:45	Etibar ISMAILOV Key Intermediates and Their Dynamics in Catalytic Systems for Di-, Oligo- and Polymerization of Olefins	Gülşah SAYDAN KANBEROĞLU Some Applications of deep eutectic solvents for the microextraction of Trace Inorganic and Organic species	Mehmet Hakkı ALMA Green Polymeric Materials From Liquefied Biomass-Based Polyols
09:45 - 10:00		Naseer Subhi AHMED Investigation of Thermoelectric Properties of Poly(ethylene dioxythiophene)-Poly (styrene sulfonic acid)/Copper Sulfide Nanocomposites	
10:00 - 10:15	Ali GÜREL Mobilizing With Organic Humic Substances In The Marmara Region Forest Areas Evaluation Of Vegetation Type, Annual Precipitation Amount And Water Dependent Change By Algorithm Hierarchical	Melek ÖZDEMİR 1-aryl-2-alkyl-3,5-dimethylpyrazolium based tunable aryl alkyl ionic liquids	Bilge IŞIK Earthen Structures in Cyprus and Earthquake Respons
10:15 - 10:30	Mehmet ALAN Examination Of Electrical Energy Values Of Biogas Obtained By Thermochemical Gasification (Pyrolysis) Method From Different Forest Tree Species (Forest Biomass) Using Ahc Method	Hüseyin KARACA Redox Chemistry, Spectroelectrochemistry and Catalytic Activity of Novel Synthesized Phthalocyanines Bearing Four Schiff Bases on The Periphery	Berna KOÇAK Voltammetric determination of pendimethalin with nafion-graphene modified glassy carbon electrode and glassy carbon electrode.
10:30 - 10:45	Abdulkadir SÜRÜCÜ Determination Of Some Heavy Metal (Lead, Nickel, Cadmium And Zinc) Pollution Of Roadside Soil At The Şanlıurfa-Viranşehir Highway	Dilek TAYLAN Estimation of P-PET in Palmer Drought Severity Index using SVM	Emad ALJURAFANI Shaping the Future of the Water Industry Breakthrough Technology in Water Desalination and waste Water Treatment
10:45 - 11:00	Ozlem TAVUKCUOGLU A New Solid-State Phosphate Ion-Selective Electrode Based On Silver-Polygluteraldehyde Phosphate	İbrahim Halil BAYDİLEK Investigation Of Adsorption On Some Inorganic Ions And Kolesterol	Vildan ENİSOĞLU ATALAY Determination Of Protonation Constants Of Triazole Derivatives By Computational Methods
11:00-11:30	<i>Coffee Break - II</i>		
	Scientific Section – A - V (Chair: Nevin ERK)	Scientific Section – B - V (Chair: Mikdat ŞİMŞEK)	Scientific Section – C - V (Chair: Ayhan HORUZ)
11:30 - 11:45	Nevin ERK Comparison Of Novel Spectrophotometric Techniques For The Simultaneous Determination Of Certain Antiretroviral Agents In Pharmaceutical Formulations	Mikdat ŞİMŞEK A Research on Past, Present and Future of Pomegranate Cultivation in Turkey	Ayhan HORUZ Effect of Silicic Acid on Some Macro and Micro Nutrients in Tomato Plant Leaf in NaCl Stress Conditions Under Solid Media Culture
11:45 - 12:00			Sibel BARATA Determination of Diplostomum sp. in Capoeta umbla from Elaziğ District
12:00 - 12:15	Nevin ERK Electrochemical Properties and Voltammetric Determination of Certain Antidiabetic Agents in Bulk And Pharmaceutical Formulation	Sema BAŞBAĞ Effects of Topping at Different Times on Fibre Yield and Quality Traits on Cotton	Ayşe POLAT YAZICI Determination of the Critical Buckling Load of Columns with Variable Cross-Section by Using the Method of Power Series
12:15 - 12:30	Salih Seçkin EROL Innovative Design in Test Setup System for Prognosis and Diagnosis of Mechanical Failures	Gülay GÜNDAY KONAN Theoretical Investigation of Correlation, Quantum Electrodynamics and Breit Effects on The Energy Levels of Ca-Like Tungsten	Emre GÜZEL Water soluble quarternizable gallium and indium phthalocyanines bearing 3-diethylamino-1-propanol: Synthesis, aggregation and photo-physicochemical properties
12:30 - 12:45	Salih Seçkin EROL Vibration Based Failure Characteristics With Belt Driven Radial Fan Through Artificial Defects	Güventürk UĞURLU Experimental and Computational Studies of Structural, Electronic and Non-Linear Optical Properties of 2,3-, 2,4-, 2,5-, 2,6-Difluorophenylboronic Acid Molecules	Özgür CANPOLAT Distribution of Some Major Ions in Northwest Region of Keban Dam Lake (Elaziğ)
12:45 - 13:00		Cansu YAMAÇ Determination of the total polyphenol content of the yellow pine bark	Vesile YILDIRIM Taxonomic composition of Epilithic Diatoms and its indicator role in the freshwater ponds.
13:00-14:00	<i>Lunch</i>		

	Scientific Section – A - VI (Chair: Zekai TARAKÇI)	Scientific Section – B - VI (Chair: Mahfuz ELMASTAS)	Scientific Section – C - VI (Chair: Shaxla TAGIYEVA)
14:00 - 14:15	Zekai TARAKÇI Effects Of Using Ghee And Olive Oil On Chemical, Textural, And Sensorial Properties Of Chocolate Spreads	Mahfuz ELMASTAS Phytotherapy and Medical Importance: Past to Present	Shaxla TAGIYEVA Thermally Desorption of Methanol from the Surface of the Aluminosilicate SIRAL Used as Carrier of the Catalyst for the Hydrogenation of CO ₂ into Methanol Based on the Data of Thermal Analysis, Chromatography and IR Spectroscopy <i>Methods</i>
14:15 - 14:30			Yusif RZAYEV Incompatibility of oils as a violation of stability during their mixing
14:30 - 14:45	Mikdat ŞİMŞEK Production Potential and Development Opportunities of Pistachio (Pistacia vera L.) Grown in Gaziantep Province (Turkey)	Derya BAL ALTUNTAŞ A Development of New Generation Biosensors with 2D Materials Beyond Graphene	İhsan KÜÇÜKRENDECI Vibration Analysis For Bracket Of Hvac Compressor In Vehicles
14:45 - 15:00	Recep AKAN The Effect of Compaction Technique on Unconfined Compression Strength of Clay Soils	Elena BATTINI SÖNMEZ Effect of Aging on Facial Expression Recognition	Kemal ERMIS Numerical Analysis Of Convective Heat Transfer Of Nanofluids In A Laminar Flow Pipe Numerical Analysis Of Convective Heat Transfer Of Nanofluids In A Laminar Flow Pipe
15:00 - 15:15	Pınar ŞEN Comparison of the catalytic activity of amine group substituted cobalt and manganese phthalocyanine complexes as hydrogen peroxide catalysts on oxidative bleaching	Elena BATTINI SÖNMEZ An Automatic System for Low, Middle and High Intensity Expressions Recognition	Faeq A. A. RADWAN Anisotropy Of Some Hexagonal Systems
15:15 - 15:30	Esra ÇIKLER-DÜLGER The Protective Effects of Fulvic Acid on the Skin Under the Chronic Water Avoidance Stress Conditions	Numan Burak ALPAYDIN Design of Dielectric Lens Loaded Horn Antenna for Radar Applications	Arif SALIMOV On Structure-Preserving Connections
15:30-15:45			Sitare RZAYEVA Structural And Optical Peculiarities Of High-Density Polyethylene Films With Incorporated Inp And Ge Particles
15:30 - 17:00	Poster Presentation – II (Chair: İbrahim Halil BAYDİLEK)		
17:00 - 18:00	Closing Ceremony		

1st International Conference on Innovations in Natural Science and Engineering (ICINSE 2018)



Poster Presentations

4 January 2018 (Thursday) 17:30 - 19:00

Poster Presentation – I (Chair: Murat TUNA)

Gülşah SAYDAN KANBEROĞLU Sunset Yellow-Selective PVC Membrane Potentiometric Sensor	Hüseyin KARACA An evaluation of Coal Fly Ash as an Adsorbent for the Removal of Methylene Blue from Aqueous Solutions: Kinetic and Thermodynamic Studies	Gulnur ARABACI Thermal profile of the borage (Trachystemon orientalis L.) plant polyphenol oxidase	Gökhan SAVAROĞLU Effect of ultrasound expose time on the partial distributions optical properties of solution for deposition of ZnO film
Naseer Subhi AHMED A Simple Green Preparation Method for Zinc Sulfide Nanoparticles	Mustafa SOYLAK Enzyme based hydrolytic microextraction of manganese in food samples	Huseyin ALTUNDAG Investigation Fractions of Some Heavy Metals In The Sapanca Lake Sediment Samples By Using Microwave Assisted Sequential Extraction Procedure	Salih Zeki YILDIZ Preparation of Metal Containing Epoxy Polymers and Investigation of Their Properties as Fluorescent Probe
Senem AKKOÇ Synthesis of 1-(2-Hydroxybenzylideneamino)-5-(4-methylbenzoyl)-4-(4-methylphenylpyrimidin)-2(1H)-one and Its Ni Complex	Mustafa SOYLAK Microextraction of Ni(II) from environmental samples and its flame atomic absorption spectrometric determination	Omer ISILDAK Development of calcium-selective potentiometric sensor using 4-Bromo-4-Bromo-kalsimisin compound as ionophore	Adnan Ali KHAN Computational study of opened-shell hydrogen bonding of HSO and HOO radicals with NH ₂ COOH stable molecule
Ümit Muhammet KOÇYIĞIT Purification and Characterization of The Carbonic Anhydrase Enzyme From Kangal Akkaraman Sheep in Sivas, Turkey and Inhibition Effects of Some Metal Ions on Enzyme Activity	Hacali NECEFOGLU Computational Studies on Structural, Conformational Analysis and Non-linear Optical Properties of (Z)-1-[4-(Trifluoromethyl)benzylidene]	Makbule Çiğdem SAYIL The Synthesis of New Group of Tetracyclic Diazaquinones and Naphthoquinone Compound	Hacer BAYRAK Antimicrobial, Antioxidant, Anti Ureas & Acetylcholinesterase Activity of some New β-Lactam Analogs Containing Thiomorpholine and Azole rings
Burcu SOMTÜRK YILMAZ Preparation of maltase-inorganic hybrid nanoflowers and investigation of influence on enzymatic activity of synthesis conditions	Gulnur ARABACI Evaluation of anti-browning compounds and some metals on Princess tree Polyphenol Oxidase activity	Makbule Çiğdem SAYIL Synthesis of New Derivatives from Naphthoquinone Containing an Electron-withdrawing Group (EWG) in the Aromatic Ring	Gulsin ARSLAN Cu(II) sorption performance of novel chitosan/ter-(vinyl pivalate-maleic anhydride-N-tert-butylacrylamide) microcapsules
Senem AKKOÇ New Organic and Inorganic Compounds: Synthesis, Characterization and Cytotoxic Activity			

5 January 2018 (Friday) 15:30 - 17:00

Poster Presentation – II (Chair: İbrahim Halil BAYDİLEK)

Duygu ULAŞ The Importance of Calcium on Human Health	İsmail AĞIR A portable proactive healthcare device employing disposable strip type Li ⁺ -selective selective electrode and implementing internet of things	Özlem ELMALI On The Concepts Used in The Characterizations of Some Topological Spaces	Hüseyin ALTUNDAG Assessment of essential elements and chemical contaminants in Twenty fish species from the Sakarya, Turkey using ICP-OES
Mikdat ŞİMŞEK A research on Production Potential of Fruitsgrown on Ağrı Province	Derya BAL ALTUNTAŞ Practical Biomedical Applications based on molybdenum disulfide	Faik GÖKALP A Theoretical approach to the chemical activities of the active compounds in portulaca oleracea	Saeed Ullah JAN DFT and AIM computation of charge transfer complex between 2,6-diaminopyridine and picric acid
Sema BAŞBAĞ Evaluation Of Fiber Technological Properties Of The Breeding Lines Obtained From Advanced Generations In Cotton (G. hirsutum L.)	Ramazan ERENLER Antioxidant activity of Salvia cryptantha	Gülay GÜNDAY KONAN Radiative Transition Probabilities for 3d ₂ and 3p ₃ 3d ₃ Transitions in W ₅₄₊	Ali SHAN A review of current energy crises in Pakistan
Güvëntürk UĞURLU Computational Studies on 4-Amino-2-, 3-Substituted Phenylboronic Acid	Salim SANI Survey Analysis Of Supply Chain Management Frameworks	Sezen Gizem GÜREL-AYDOĞAN The Effects of Fulvic Acid Against Water Avoidance Stress-Induced Damage of Rat Colonic Mucosa	Murat TUNA Synthesis Of Novel Schiff Base Metal Complexes And Investigation Of Their Catalytic Properties For Bleaching Applications
Zekai TARAKÇI Investigation Of Effects On Ripening Of Different Types Of Fruits Used In Kashar Cheese Production	Özlem ELMALI On a New Investigation of Some Sets via Mappings	Vildan ENİSOĞLU ATALAY Modeling Of Bsa-Metal Ion- Polycomplexes Of Poly(Methyl Vinyl Ether-Co-Maleic Anhydride) By Theoretical Methods: Semi-Emperical Pm6 And Docking Study	Hacer BAYRAK Antimicrobial Activity And Synthetic Route Of Some New Heterocyclic Compounds Containing Antipyrine
Mehmet Hakkı ALMA Adsorption Of Remazol Orange Rgb By Rigid Foam Prepared From Peanut Shell			

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ANISOTROPY OF SOME HEXAGONAL SYSTEMS

Fae'q A. A. Radwan *¹

ABSTRACT

The norm of elastic constant tensor and the norms of the irreducible parts of the elastic constants of some hexagonal systems (Apatite Fluor apatite, Hydroxyapatite, Beryl, Beryllium, Beryllium oxide, Biotite, Cadmium, Cadmium selenide, Cadmium sulfide, Cadmium telluride, Cesium copper chloride, Calcium-magnesium, Cancrinite, Cerium fluoride, Cobalt, Cobalt nickel, Co - 32 wt % Ni, Copper chloride, Dunite, Dysprosium, Erbium, Gadolinium, Gadolinium-yttrium, Gd - 40 at % Y, Gallium selenide, Graphite, Hafnium, Holmium, Indium bismuth, Indium selenide, Lead germinate vanadate, Lithium iodate, Lithium iodate, Yttrium, Zinc oxide (Zincite), Zinc selenide, and Zinc telluride) are calculated. The relation of the scalar parts norm and the other parts norms and the anisotropy of the materials are presented. The norm ratios are used as a criterion to present the anisotropy degree of the properties of these materials.

Keywords: Norm, Anisotropy, Elastic Constant, Irreducible, and hexagonal systems

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ON STRUCTURE-PRESERVING CONNECTIONS

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ABSTRACT

On an almost complex manifold M , a connection ∇ is called a \mathcal{A} -connection if the almost complex structure J is covariant constant with respect to ∇ , i.e. $\nabla J = 0$. Also, in this case we say that the connection ∇ is structure-preserving connection.

An important field in complex geometry is the search of anti-Hermitian metrics having special properties. A semi-Riemannian metric g on an almost complex manifold M is called anti-Hermitian if for every vector fields X and Y on M , $g(JX, JY) = -g(X, Y)$. The pair (g, J) is usually called an almost anti-Hermitian structure (simply anti-Hermitian when J is integrable) and g the twin anti-Hermitian metric. A Levi-Civita connection of which preserves J is usually called anti-Kähler connection. In such case the anti-Kähler connection of (g, J) coincides with the Levi-Civita connection of twin metric $-g$. A connection with torsion T which preserves J and g is usually called anti-Hermitian metric connections. One of these types of connections with additional conditions on torsion T in Hermitian geometry was defined by Chern. Similar connections in anti-Hermitian geometry was described by author of the present presentation.

In this presentation we find the formula of connections under which an almost complex structure is covariant constant. These types of connections on anti-Kähler-Codazzi manifolds are described. Finally, twin metric-preserving connections are analyzed for quasi-Kähler manifolds.

Keywords:

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FREE VIBRATION OF A FLUID-FILLED HOLLOW SPHERE WITH INHOMOGENEOUS INITIAL STRESS

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ABSTRACT

This paper presents an exact three-dimensional analysis of the free vibration and natural frequencies of an inhomogeneous pre-stressed hollow sphere filled with a compressible inviscid fluid. It is assumed that the initial stresses in the hollow sphere are caused with the uniform compressible radial forces acting on the outer surface as well as with the hydrostatic pressure acting on the inner surface of that. Under these radial forces, initial stresses in the sphere are to be inhomogeneous. These initial stresses in the sphere are determined analytically by using the concrete known expressions.

The motion of the foregoing pre-stressed sphere is written within the scope of the three-dimensional linearized theory of elastic waves in initially stressed elastic bodies [1,2]. However, the motion of the fluid is written within the scope of the Navier-Stokes equations for compressible barotropic inviscid fluids [3]. On interface surface between the sphere and fluid, the compatibility conditions are satisfied.

For solution to the equations of motion related to the hollow sphere the discrete-analytical method developed in the works [3, 4] is employed. According to this method, the hollow sphere is divided into a certain number of sub-hollow spheres in each of them the initial stresses are taken as homogeneous one. Namely, this statement allows using the analytical solution method for the equations obtained for the potentials in the Helmholtz decomposition in the solution of the equations of elastodynamics. The solution to the corresponding equations for fluid motion is found analytically in the spherical coordinates through the spherical Bessel functions. Using the traction free condition outer surface of the hollow sphere, the contact conditions between the sublayers and compatibility conditions between the fluid and sphere on the inner surface of the sphere the frequency equation is obtained for determination of the natural frequencies for the hydro-elastic system under consideration.

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The aforementioned frequency equation is solved numerically, the results illustrated the influence of the existence of the fluid into the hollow cylinder, and the influence of the geometrical and mechanical parameters on the natural frequencies are presented and discussed.

Keywords: Keyword1, Keyword2, Keyword3, Keyword4, Keyword5

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MATHEMATICAL MODELLING AND THEORETICAL STUDY ON THE TUNNEL+SOIL SYSTEMS

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ABSTRACT

A safe and reliable use of the modern high-speed underground trains and other types of underground moving wheels requires theoretical investigations of corresponding dynamical problems. Under such investigations, underground structures into which the mentioned high-speed wheels move are modelled as infinite hollow cylinders surrounded by an elastic or viscoelastic medium. At the same time, the high-speed wheels are modelled as moving load or oscillating-moving load. Consequently, the study of the dynamics of the tunnel + soil systems is reduced to the investigations of the problems related to the dynamics of the moving or oscillating moving load acting on the interior of the interior of the hollow cylinder surrounded by elastic or viscoelastic medium. The present work is related, namely, to these studies.

Mathematical formulation of the considered problems as in [1, 2 and 3], is made within the framework of piecewise homogeneous body model with utilizing of the exact equations and relations of elastodynamics. It is assumed that on the interface surface between the hollow cylinder and surrounded elastic medium the shear-spring type imperfect contact conditions are satisfied. The method of solution to the corresponding boundary and contact problems is developed by employing the moving coordinate method and the Fourier transform method with respect to the axial coordinate. The originals of the Fourier transforms are found numerically.

Numerical results on the critical velocity of the moving load and on the interface stresses are presented and discussed. In particular, it is established that the imperfectness of the contact between the constituents reduces the values of the critical velocity under which the resonance type accidents take place.

Keywords: Keyword1, Keyword2, Keyword3, Keyword4, Keyword5

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Water soluble quarternizable gallium and indium phthalocyanines bearing 3-diethylamino-1-propanol: Synthesis, aggregation and photo-physicochemical properties

Emre Güzel*

ABSTRACT

Phthalocyanines (Pcs) which are an important family of macrocyclic compounds class, have many uses such as gas sensors, catalysts, solar cells, electrochromic devices, Langmuir Blodgett films, liquid crystals and photosensitizers in photodynamic cancer therapy (PDT). One of the most important macrocyclic compounds suitable for photodynamic therapy applications is phthalocyanines. Photodynamic therapy (PDT) is an important treatment method using a photosensitizer (PS) and visible light to produce reactive oxygen species that selectively destroy cancerous cells. The selectivity of PDT treatment depends both on the ability of the photosensitizer compound to target the tumor and on the light used to activate it. An ideal photosensitizer should have a strong absorption in the "therapeutic window" (600-800 nm) for low dark toxicity, high selectivity for tumors, rapid clearance from normal tissues, and best light penetration in the tissue. In this context, photosensitizers should exhibit water solubility, non-aggregate and absorptive properties in the desired region. Cationic photo-sensitizers are both used in photodynamic therapy due to their water-solubility properties as well as their high photoinactivation properties.

In this work, 3-diethylamino-1-propanol substituted water soluble quarternizable gallium and indium phthalocyanine photosensitizers were prepared and the photophysical and photochemical properties of the complexes were investigated.

Keywords: Water-soluble, Phthalocyanine, Photosensitizer, Cationic, Photodynamic Therapy

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Metal-containing polymers obtained via functionalized Schiff base metal complexes and their catalytic properties for removing dyes from the colored effluents

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ABSTRACT

Metal-containing polymers, known as organometallic polymers, metallo polymers or metal organic frameworks have unique properties for many applications. One of them is to be stressed out as the catalyst. Polymeric materials (polymer, framework etc.) have been used in many studies as homogeneous or heterogeneous catalysts. Oxidative bleach catalysis for removing organic dyes are also well known industrial application. Schiff base metal complexes are one of the organic components or metal complexes from which the metal containing polymers can be prepared. Because of the organic dyes are known to cause serious environmental problems due to their molecular stability, many researchers have been struggled on to overcome this issue. The catalytic activities of the newly prepared metal-containing polymers as macromolecular structures derived from the functionalized Schiff base metal complexed monomers were examined to bleach the colored effluents.

In this work, Schiff base metal complexes containing OH functional groups were synthesized as (Mn (II), Fe (II) and Co (II)) complexes and their polyurethane type polymers were prepared and characterized with the conventional spectrophotometric methods. The bleaching performances of the obtained materials (both for monomers and polymers) against morphine dye were investigated in both homogeneous and heterogeneous conditions. The obtained results will be presented and discussed comparatively in the 1st International Conference on Innovations in Natural Science and Engineering (ICINSE 2018).

Keywords: Schiff base complex, polyurethane polymer, bleach catalysis

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Development of Potentiometric Sensors and Investigation of Behavior

Ömer İŞILDAK

ABSTRACT

Potentiometric methods used in the determination of biological substances and ionic species in aqueous solutions have many advantages over other commonly used instrumental methods. AAS (Atomic Absorption Spectroscopy), ICP-MS (Inductively Coupled Plasma-Mass Spectroscopy), High Performance Liquid Chromatography (HPLC) and so on. the methods are expensive, the selectivity is low and the derivation process has led to the development of new methods. Work on potentiometric based chemical sensors and biosensors that are prominent in the determination of many ionic species and biomaterials that are important in biological, food and environmental samples are increasing day by day because they are economical, selective and sensitive. The prominent in the determination of many ionic species and biomaterials that are important in biological, food and environmental samples, work on potentiometric based chemical sensors and biosensors are increasing day by day because they are economical, selective and sensitive (Lakard vd., 2004; Pandey ve Mishra, 2004; Yoshinobu vd., 2001; Mourzina ve Yoshinobu, 2001). As a result, significant improvements have been made in potentiometric sensor technology (Isildak, 2013; Isildak and Covington, 1998). The fact that the operating mechanism of the potentiometric sensors is not tied to the sensor surface area has led to an increase in the work on sensor preparation technology in micro dimensions. Systems containing ion selective electrodes (ISE) are much cheaper and more practical than other systems. In addition, they are also suitable for on-line and in-situ work as they can be miniaturized. The primary selective components of ion-selective membranes are lipophilic complexing agents termed ionophores. With the selection of suitable ionophores, a great variety of cation and anion selectivities can be obtained. To date, macrocyclic substances such as some natural antibiotics, oligoamides and crown ethers have been used as ionophores. In this work, the ionophor compounds required for the development of an effective membrane layer in the preparation of anion selective potentiometric sensors at the first stage were synthesized, characterization and function tests were performed. Subsequently, the synthesized membrane active ingredient (ionophor) was used for the preparation of fully solid-state-contact potentiometric PVC membrane sensors in micro-dimensions. Potentiometric characterization of these sensors (response time, linear operating range, detection limit and pH working range, selectivity to ions and service life) were performed under static conditions.

Keywords: Potentiometric sensor, ionophore, selectivity to ions.

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Multi element determination in some herbal teas from Turkey by ICP-OES

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ABSTRACT

Herbal tea plays an enormous role in terms of intake of a number of nutritional trace elements in human body (1). Hence the chemical components in tea have received major interest since they are related to health. Besides essential macro and micro elements experimental studies showed that the accumulation of a great deal of excess of nonessential trace elements in tea leaves may finally increase the metal burden in human body (2). The aim of this experimental is to research the level of the trace element (Al, Ba, Cr, Cu, Fe, Mn, Ni, Sr and Zn) in the commercially available 18 dry tea samples from Sakarya, Turkey. Various analytical parameters were optimized such as sample amount, temperature, mixture of HNO₃ and H₂O₂ volume, etc. Validity of the analytical procedure was checked by INCT-TL-1.CRM certified reference material. The results from the analysis of CRM were all within the 95% confidence level. The determination of nine elements in the samples was performed by ICP-OES. The experimental results were compared with reported values in the literature.

Keywords: Herbal tea; ICP-OES; multi element; Turkey

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Kuşburnu (*Rosa canina* L.) içindeki etken bileşiklerin kimyasal aktivitelerine teoriksel yaklaşım

Theoretical approach to the chemical activities of the active compounds in rosehip (*Rosa canina* L.)

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ABSTRACT

Rose grows wildly in various regions of Turkey. It has a rich composition as mineral (K, P) and vitamin contents, higher proportion of Ascorbic acid than any other commonly available fruit or vegetable and wild fruits have a high phenolic content (1). Linoleic and linolenic acid was higher in the extraction of propane (2). The methanolic extracts of it has high DPPH radical scavenging activity due to phenolic compounds but low ascorbic acid in the extract (3). The ethanolic extract was shown to possess significant inhibitory activity against inflammatory models (4) The amount of ascorbic acid in dog rose fruit (417 mg per 100 g) is about 6 times higher than that in orange sample and has highest stability in untreated dog rose fruits (5). In our study; the chemical activity of some effective substances in rosehip (*Rosa canina* L.) for different phases were investigated by using Density functional theory (DFT) as theoretical.

Keywords: Rosehip (*Rosa canina* L.), ascorbic acid, Linoleic and linolenic acid

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Multi element determination in some herbal teas from Turkey by ICP-OES

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ABSTRACT

Herbal tea plays an enormous role in terms of intake of a number of nutritional trace elements in human body (1). Hence the chemical components in tea have received major interest since they are related to health. Besides essential macro and micro elements experimental studies showed that the accumulation of a great deal of excess of nonessential trace elements in tea leaves may finally increase the metal burden in human body (2). The aim of this experimental is to research the level of the trace element (Al, Ba, Cr, Cu, Fe, Mn, Ni, Sr and Zn) in the commercially available 18 dry tea samples from Sakarya, Turkey. Various analytical parameters were optimized such as sample amount, temperature, mixture of HNO₃ and H₂O₂ volume, etc. Validity of the analytical procedure was checked by INCT-TL-1.CRM certified reference material. The results from the analysis of CRM were all within the 95% confidence level. The determination of nine elements in the samples was performed by ICP-OES. The experimental results were compared with reported values in the literature.

Keywords: Herbal tea; ICP-OES; multi element; Turkey

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Buckling delamination of a PZT/Metal/PZT sandwich rectangular thick plate with closed-circuit conditions

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ABSTRACT

This work studies the 3D buckling delamination problem around the interface band cracks which are in the PZT/Metal/PZT sandwich rectangular thick plate within the scope of the piecewise homogeneous body model by utilizing the so-called 3D linearized theory of stability loss for piezoelectric materials [1]. It is assumed that the plate is mechanically simply supported at all the lateral edges of the rectangular plate and also closed-circuit conditions with respect to the electric potential along all the lateral edges as well as the face planes of PZT layers. Moreover, it is assumed that on the opposite two ends of the plate which are parallel to the band cracks' front, uniformly distributed normal compressive mechanical forces act. It is determine the critical values of these forces due to evaluation of the crack opening within the initial imperfection criterion [2]. Formulation of the considered buckling delamination problems are made in the framework of the exact equations of 3D linearized electro-elasticity theory for piezoelectric materials. The solution to the corresponding boundary value problems is made numerically by employing the 3D FEM. Numerical results retated to the influence of the problem parametres such as electro-elastic constants, ratios of the crack length to the plate length etc., and as well as related to the influence of the coupling effect between the electrical and mechanical fields on the critical forces are presented and discussed. In particular, it is established that the piezoelectrical properties of the face layers' material of the considered sandwich rectangular plate increase the critical values of the buckling forces. This can be explained with the "stiffening" effect of the piezoelectric materials. Moreover, the comparison of the

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obtained results with the corresponding ones given in the paper [3] in which the open-circuit condition is satisfied on the face planes of the piezoelectric layers, shows the critical forces obtained in the present case are less than corresponding ones obtained in the paper [3]. Moreover, the analysis of the obtained numerical results shows that they agree in the qualitative sense with the corresponding ones obtained in the papers [4, 5] in which the plane-strain state and axisymmetric buckling delamination problems are investigated.

Keywords: Piezoelectric material, Closed-circuit, Band crack, Critical force, Buckling delamination, Sandwich rectangular thick plate

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Drought Estimation of Çanakkale by Gene Expression Programming

Onur Özcanoglu¹, Özlem Terzi^{*2}, E. Dilek Taylan³

ABSTRACT

The differences in both duration and amount of precipitation have great importance on the drought due to the global climate change in last decades. Therefore, drought should be taken into consideration for sustainable water resources studies. For estimation of the drought of Çanakkale province, gene expression programming (GEP) method was used in this study. The precipitation data of Çanakkale, Bozcaada and Gökçeada stations were taken from the Turkish State Meteorological Service. The standardized precipitation index (SPI) method was used to determine the drought indices of 3, 6, 9, 12 and 24 months. The drought values of Çanakkale province were estimated by using historical precipitation records between 1975-2010 years. The drought values of Bozcaada and Gökçeada stations were used as input parameters to estimate the drought of Çanakkale station. Many model combinations were tried with different mathematical functions ($*$, $/$, $-$, $+$, $\sqrt{\quad}$, \wedge , \ln , 10^x , \log) in the GEP modeling stage. As the developed models are examined, determination coefficients (R^2) of the models for 6, 9, 12 and 24 months drought periods were found to be higher than 0.80 in general. On the other hand, R^2 value for 3 months drought period was found to be approximately 0.65. As a result the GEP method was generally found to be successful in estimation of drought.

Keywords: Drought, SPI, GEP, Çanakkale.

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Earthquake Resistance Of Masonry Historical Monuments, Case Of: The Grand Mosque, Afyon

1st Pınar Usta*¹

ABSTRACT

These buildings that link the past and the present are of great importance in terms of reflecting the experiences and characteristics of different cultures. This explains that why protection of historic monuments is so important. The conservation of historic monuments which form our historical and cultural heritage is possible if only in the case of investigating them in detail, obtaining their problems and improving solution method and techniques. Seismic vulnerability assessment of the monument was carried out via three-dimensional time-history dynamic analyses of the structure. Minimum and maximum values of Displacements, base shear and stress were interpreted, and the results were displayed graphically and discussed. The Grand Mosque was selected to study in this paper. Afyon Sandıklı Grand mosque is located in Cuma district, Yukarıpınar. The mosque, which is built in 14th century with wood column and soil roof, is known that the biggest mosque of Sandıklı. Minaret and harim sections were rebuilt in the 16th century. The historical mosque has undergone a thorough restoration in 1932. In this paper, Grand mosque is modeled and analyzed by using SAP 2000 in accordance with the dimensions of an architectural building survey. The earthquake motion was applied in two different directions which is X and Y. As a result of the analysis, displacements, stresses (tensile and compressive), base shear force were calculated under the effect of earthquakes. Structural safety was evaluated, and three-dimensional finite element analysis gave a general idea about the structural performance of the mosque.

Keywords: Earthquake resistant structures, Finite elements, Masonry, Seismic vulnerability;

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Estimation of P-PET in Palmer Drought Severity Index using SVM

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ABSTRACT

Drought forecasting is of great importance for optimum usage of water resources. There are various methods for estimating meteorological drought. In the Palmer Drought Severity Index (PDSI) which is one of these methods, drought is calculated according to P-PET difference. The difference is estimated using the Thornthwaite method which takes into account the moisture content of the soil and climate in a region. It is calculated using precipitation (P) and potential evapotranspiration (PET). In the study, P-PET differences determined according to Thornthwaite method for Alanya Station were modeled by Support Vector Machines (SVM) method. The precipitation and temperature data taken from the Turkish State Meteorological Service were used as inputs between 1969-2011 years. Examining the results, it was seen that the developed model has good performance based on determination coefficients (R^2) and mean absolute error (MAE). For testing set, R^2 and MAE values were found as 0.916 and 77.16, respectively. As a result, it could be said that this SVM model can be easily used for P-PET estimation in PDSI as an alternative to Thornthwaite method.

Keywords: PDSI, Thornthwaite, P-PET, SVM.

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Separation of Emulsion Water from Petroleum and Protection of Naphtha Well from water currents

Elman Hazar*¹

ABSTRACT

Recently, it has been proven that the amount of water obtained in the composition of the oil is sufficient. Such a mixture is continuously followed up to the point where the naphtha from mine is stored and consequently a certain amount of water-oil-emulsion (w-o-e) is formed which depends on the stability of the resulting (w-o-e) mixture, dispersive composition of the mixture, the hardness of the salt-absorption- layers (s-a-s), the amount of water and the temperature of the mixture.

As a result, naphtha needs to be separated from water and salt in the preparation process. The dispersion process of the water-oil -emulsion (w-o-e) consists of the following processes. Aggregation of mixture-water, separation of phases, treatment with emulsion, disintegration of the mixture in water through (s-a-s) in separating systems.

The illustrated process involves many parallel and interwoven applications. The dissolution process of the salt-absorption-layer(s-a-l) of the layer water continues as a result of mixing the mixture using the emulsion and or fresh water solution. The second process continues very vigorously as a result of the mutual collision of two different drips and accompanies the formation of an intermediate emulsion which accelerates the cleaning rate naphtha from the salt and eventually the water is completely separated from the oil. The separation of the water droplet from the oil-water -emulsion (o-w-e) at high speed and the division of the water-oil- emulsion (w-o-e) cause turbulence in the stream. The separation speed and width of the emulsion are determined mostly by the disper compound of the time system.

Keywords:

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INVESTIGATION OF THE USE OF PROPOLIS AS A FILLER MATERIAL IN CONCRETE CRACKS

Ayşe KAÇAR^{1*} Harivan ADIYAMAN, Ömer Faruk YILDIRIM, Recep ÇALIŞIR

ABSTRACT

Cracks are both a deterioration of the structural integrity of the concrete and the rusting of the fitting due to the influx of water and oxygen through the cracks, reducing the lifetime of the structures by half. Propolis is an adhesive and resinous material with antimicrobial, antiviral, antifungal, antioxidant, antiparasitic properties, which the bees gather from plant shoots and buds and close the cracks and fractures. In this study, the use of propolis material produced by bees as a fill material in concrete cracks was investigated in order to close cracks and fractures in the chimney.

Keywords:

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Effect of Aging on Facial Expression Recognition

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ABSTRACT

This study investigates on the impact of aging on facial expression recognition (FER). FER is an active research topic in both engineering and psychology research fields. Although humans can recognize facial expressions without effort, an artificial FER system still struggles in presence of one or more disturbance elements, such as aging, identity information, intensity of the expression, pose, zoom, illumination, etc. Recent research in psychology underlined the importance of considering a complete lifespan of expressive faces, when working on expressions. In the parallel research area of computer vision, an automatic FER system must be resistant to age variation.

Inspired by the work done by Guo et al., we challenged the FACES database, introduced by Ebner et al. 2010. We compared the performance of the Sparse Representation based Classifier (SRC) on the 10-fold experiment on FER, with and without aging effect: faces of young actors (age: 19-31, 29 women, 29 men) have an average performance of 93%, faces of middle age models (age: 39-55, 27 women, 29 men) 86%, and faces of old actors (age: 69-80, 29 women, 28 men) result in an average accuracy of 79%. When working with all faces the FER experiment has an average hit rate of 87%. From our results we infer that age strongly affects the performance of the FER experiment. Looking at the pictures, we infer that a main issue is the different levels of intensity of the expression, and, a possible solution could be to work with high discriminative blocks of the face.

Keywords: Facial Expression Recognition, Aging, Sparse Representation based Classifier (SRC)

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EFFECT OF BOUNDARY CONDITIONS ON FORCED VIBRATIONS OF LAMINATED COMPOSITE PLATES OF SUPPORTED BY SPRINGS

Ihsan Kucukrendeci*¹, Kemal Ermis², Mehmet Caliskan³

ABSTRACT

This paper deals with effect of boundary conditions on forced vibrations on laminated composite plates of supported by spring. Classic finite element method is used in analyzes. The boundary condition equations of composite plate are obtained from the developed model. Special software is developed to analyze of these equations. The effects of boundary conditions on forced vibrations are seen as numerically. The obtained results are graphically presented and discussed. Results of study can be important for the use of composite plates. This study can provide great convenience to the users of composite plates.

Keywords: Laminated composite plate, Forced vibration analysis, Finite element method

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An Automatic System for Low, Middle and High Intensity Expressions Recognition

Elena Battini Sönmez^{1*}

ABSTRACT

Facial expression recognition (FER) is an active research topic in both engineering and psychology research fields. Automatic FER has several applications ranging from human-behaviour understanding, human computer interface, marketing, interactive computer games, etc. Currently, most of research on FER focuses on apex expressions, i.e. expressive faces with exaggerated mimic. However, expression evolves over that time, and the most natural and common ones have subtle guises. Inspired by the work done by Wingenbach et al., we challenged the ADFES-BIV database, which stores videos expressing low, intermediate and high intensity expressions acting the 6 basic emotions of Anger, Joy, Disgust, Fear, Surprise, Sadness, and the 3 complex emotions of Contempt, Embarrass and Pride, plus the Neutral face. We run the Leave-One-Subject-Out experiment on FER, we compared the performance of the Sparse Representation based Classifier (SRC) against the one of human beings, provided by Wingenbach et al: the average raw hit rate of humans is (49%, 68%, 75%) respectively for (low, middle, high) intensity expressions, while the average performance of the proposed computational model is (70%, 84%, 85%). The top accuracy is obtained when the SRC-based model takes advantage of the temporal information presents in the videos. However, when comparing the average performance of every expression at different levels of intensity, the accuracy of the proposed automatic system presents some anomalies: an increase in the amount of expressiveness of the mimic does not always correspond to an improvement in the classification rate. Future work includes investigation of this issue.

Keywords: Affective Computing, Multi Intensity Expressions, Sparse Representation based Classifier

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VIBRATION ANALYSIS FOR BRACKET OF HVAC COMPRESSOR IN VEHICLES

Mehmet Caliskan¹, Kemal Ermis², Ihsan Kucukrendeci^{3*} Bahadır Hakan Canpolat⁴

ABSTRACT

Bracket of compressor can be affected from vibrations of engine. These effects may be able to disorder of compressor and fatigue crack of its bracket.

In this study, the sources causing the vibration and noise problems were investigated in the air conditioning compressor of an intercity bus by experimental study. First of all, accelerations from 16 points were measured on around the air conditioner compressor, which was structurally connected to the engine compartment, where the vibration of the vehicle was active when the compressor was in operation or not. When the vehicle is no moving, the frequency analysis of the vibrations of the motor caused by the vibrations at different speeds in the air conditioner compressor bracket is made. As a result of the examination, it was seen that the air conditioning compressor resonated with certain frequencies originating from the motor. In addition, modal analysis was performed on the bracket model and the natural frequency values of the structure were obtained.

Keywords: Vibration analysis, Air conditioning compressor, Modal analysis

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COMPARISON OF NOVEL SPECTROPHOTOMETRIC TECHNIQUES FOR THE SIMULTANEOUS DETERMINATION OF CERTAIN ANTIRETROVIRAL AGENTS IN PHARMACEUTICAL FORMULATIONS

Nevin ERK *¹

ABSTRACT

First derivative ratio spectra, ratio subtraction and ratio difference spectrophotometric technique were presented for the simultaneous determination of antiretroviral agents mixture namely tenofovir disoproxil fumarate (TEN) and emtricitabine (EMT) in the pharmaceutical dosage forms. The firstly technique depend on the application first derivative ratio spectra spectrophotometric to resolve the interference due to spectral overlapping. The first derivative ratio spectra spectrophotometric technique by measuring the first derivative signals at 269.60 nm of TEN and 241.04 nm of EMT, respectively. The other one technique was ratio subtraction spectrophotometry where the λ_{max} signals at 260.6 nm for TEN, or 241.7 nm for EMT were selected to simultaneous determination TEN or EMT in their binary mixtures. On the other hand, the ratio difference spectrophotometric technique was applied for simultaneous determination of TEN or EMT drugs. The difference amplitudes in the ratio spectra at 245.3 – 261.3 nm and at 233.7 – 244.9 nm were selected to determine TEN and EMT in the binary mixture. The calibration curves were linear over the concentration range of 4.0-40.0 μgml^{-1} TEN, or 4.0-42.0 μgml^{-1} EMT, allowing a rapid, accurate and precise simultaneous determination of the concentration of both analytes. The proposed methods were applied to the determination of this compound in synthetic mixture and in pharmaceutical preparation. Regarding the precision of the presented spectrophotometric techniques a statistical comparison of the results was performed using Student's t-test and F-test at the 95 % confidence limits.

Keywords:

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Structural and Optical Peculiarities of High-Density Polyethylene Films with Incorporated InP and Ge Particles

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ABSTRACT

X-ray fluorescence microscopy in combination with atomic force microscopy, FT-IR spectroscopy was used to characterize the films of High Density Polyethylene (HDPE) with different thickness (10, 50, 100, 200 μm) and content (2,3,4,6,10 wt.%) of InP/Ge particles with the size of $<1 \mu\text{m}$. The distribution of the active components in the polymer matrix, surface morphology of the material as a function of InP/Ge content were determined. The results of these studies were used to optimize preparation technology and required properties for these films. The maps of the distribution of InP/Ge in a composite by scanning its surface with a spot of a beam 10 μm and 100 μm in diameter were constructed depending on the content (up to 10 wt.%) of the inorganic fillers - indium phosphide and germanium. The uniformity of the filler distribution in the films was controlled also by the Fourier-IR absorption spectra. The introduction of InP/Ge particles leads to redistribution of the IR intensities. This case was used to characterize the influence of the fillers on the crystallinity of the HDPE film. It was established the decreasing of the crystallinity degree of the initial HDPE samples from 65%, to 47% for the HDPE samples with the 10% InP/Ge filler.

Keywords: InP, Ge, high-density polyethylene, preparation, properties

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The Effect of Compaction Technique on Unconfined Compression Strength of Clay Soils

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ABSTRACT

Compaction is a stabilization technique for improving engineering properties of soils reducing gaps between grains and enhancing density and it is widely used especially in road pavement. This method is an application aimed to lessen the volume of soils without decreasing quantity of water and grain in the soil and changes the structure of soils (Crispim, ve diğeri 2011). There are many compaction methods available but dynamic and static compaction methods are most common ones in application (Aytekin 2004). In this paper change in unconfined compression strength of specimens prepared by means of static compaction and dynamic compaction with same initial conditions in different water contents are observed. As a result it is seen that the specimens are prepared by dynamic compaction method with standard proctor energy have more less unconfined compression strength compared to the specimens prepared by static compaction method. Besides it is found that the difference between unconfined compression strengths of the specimens prepared by static and dynamic method is more clear in the neighborhood of plastic limit and optimum water content and furthermore this decrease can be reach at %80 ratio for some specimens.

Keywords: Compaction method, unconfined compression strength, clay

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Paradigm Shift in the Definition of 'Domestic': A Global Perspective

Yunus A. Çengel¹

ABSTRACT

In the rapidly changing and competitive global environment, it is inevitable for the definition of domestic product or firm to undergo a fundamental change. The most domestic or national product of a country is one that is made by a company belonging to that country and provides the highest benefit to the people of that country regardless of the ratio of the domestic parts used and the country in which it is developed or manufactured. Likewise, the most domestic or national company is the one that belongs to that country and provides the highest benefit to the people of that country regardless of the ratio of the domestic parts it uses and the country where the manufacturing plants and research centers are established. The benefits provided to the people covers a wide range from increasing the gross domestic product to know-how development, from decreasing the current account deficit to contribution to the innovation ecosystem, and even overjoying the people with national pride as the world leader in a product or technology, like world championship in football.

Keywords: innovation, globalization, domestic goods, global cooperation, protectionism, national product, national firm

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The Effect Of Accelerators On Vulcanization Of Different Rubber Compounds

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ABSTRACT

The effect of accelerator type on vulcanization characteristics and mechanical properties of natural rubber and EPDM was investigated. Also the effect of growing quantity of MBTS on vulcanization characteristics and mechanical properties of natural rubber was investigated. The results show that the fastest cure time is obtained with thiurams and dithiocarbamates for natural rubber. Sulphenamides, especially TBBS gives the best tensile strength. The best elongation at break is obtained with dithiocarbamates. The cures time decreases and tensile strength increases by increasing dose of MBTS. Elongation at break first increases by increasing dose of MBTS and then decreases. The fastest cure time and best tensile strength for EPDM is obtained with dithiocarbamates. The higher elongation at break is obtained with DPG.

Keywords: Natural Rubber, EPDM, Accelerator, Vulcanization, Dithiocarbamates, Thiurams, Sulphenamides

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A INVESTIGATION OF KINETICS OF DYEING POLYESTER FIBERS IN MICROWAVE MEDIA

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ABSTRACT

The trend in the use of polyester fibers has been increasing in the world textile sector since their first production and introduction into the markets in 1940's and it is anticipated that this trend will continue to increase. The studies on improving the process conditions in the polyester fiber dyeing and finishing sector, developing new dyeing methods and the synthesis of disperse dyestuff used in dyeing are still continuing. In this thesis study, the performances of dyeing methods applied on 100% polyester fabrics using disperse dyestuff are compared and the differences are aimed to be determined. In this study, dyeability of polyester fiber is investigated in different dye baths using microwave and ultrasonic energy. By this purpose dyeing experiments have been done in different dye baths (six different liquors to good ratio: 1/10, 1/20, 1/30, 1/50, 1/70 and 1/100 and five different dyestuff concentration: %0.5, %1, %2 and %4 and optimum dye bath conditions were obtained. Dyeability of fibers was determined by using color strength values (K/S). In order to examine the kinetics of dyeing, diffusion coefficients in all methods were calculated..

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Evaluation of Some Concentrate Feedstuffs for Nutrient Contents, Metabolizable Energy Levels and Relative Feed Values

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ABSTRACT

The study was conducted to determine the nutrient contents, metabolizable energy levels, relative feed values and macro-element contents of eight different concentrate feedstuffs using in animal feeding. Accordingly, the concentrate feedstuffs were subjected to laboratory analyzes. According to the analysis results; dry matter contents 87.29-92.13%, crude ash contents 1.57-7.21%, organic matter rates 81.35-89.01%, crude protein contents 7.07-45.94%, crude oil contents 0.89-9.07%, metabolic energy values 3112.1-3265.3 kcal/kg, calcium contents 0.20-1.48%, magnesium contents 0.02-0.37%, phosphor contents 0.27-0.50%, potassium contents 0.36-2.60%, acid detergent fiber (ADF) contents 9.12 - 44.03%, neutral detergent fiber (NDF) contents 11.12-62.88%, digestible dry matter (DDM) contents 54.60-80.24%, dry matter intake (DMI) 1.91-13.16% and relative feed value (RFV) values 80.77-809.68 were changed at the intervals. As a result, the study revealed that the soybean pulp had the most superior properties as a source of protein and energy for livestock. The soybean pulp is followed by narbon vetch grains as a source of protein and energy. In addition to being a good source of protein, the narbon vetch grains have been also found to be a good source of energy. And in this respect it could be an alternative to grain fractures, which are commonly used in producing concentrated feeds in Turkey.

Keywords: Concentrate feedstuffs, crude protein, ADF, NDF, metabolic energy, mineral substances

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Nanoenhanced membranes by incorporation of MWCNTs and TiO₂ for water treatment

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ABSTRACT

Membrane technology is an appropriate and economic technology for water purification. However, widespread application of membrane technology, for water treatment process, some problems remain for membranes. The problems are, mechanical stability, limited flux, limited selectivity, membrane fouling on the active surfaces and blockage in the membrane pores. To address these problems, membranes are functionalized by incorporation of nanoparticles to the membrane. For these most of the prominent nanoparticles are carbon nanotubes (CNT) and titanium oxide (TiO₂) and also other nanoparticles.

High performance membrane design is important for affecting of membrane performance which can be possible by functionalisation with multi wall carbon nanotube (MWCNT) which has unique physical properties on polymer support, perfectly porous structure, and additionally photocatalytic activity of TiO₂ that can be minimize the membrane surface for fouling. There are numerous methods applied in order to functionalize the membranes with these nanoparticles.

In this presented work, nanoenhanced membranes was prepared with incorporation of MWCNTs and TiO₂ nanoparticles and characterized TGA, contact angle, SEM and AFM techniques. The obtained results will be presented.

Keywords:

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Solving Process Planning, WMS Dispatching, and WPPW Weighted Due-Date Assignment Simultaneously Using Random-Genetic-Hybrid Search

Halil Ibrahim Demir^{*}, Caner Erden, Abdullah Hulusi Kokcam, Onur Canpolat

ABSTRACT

Although traditionally process planning, scheduling, and due date assignment are three important manufacturing functions performed separately and sequentially. There are numerous works on IPPS (Integrated Process Planning and Scheduling) and SWDDA (Scheduling with due date assignment) and some works on IPPSDDA (Integrated process planning, scheduling, and due date assignment) problems. There are high interrelations between these three functions and they should be handled concurrently to improve global performance. Although according to classical view only tardiness should be punished, according to JIT philosophy both earliness and tardiness should be punished. Since nobody wants far due dates we should also penalize due date related costs and at this study, we penalized all of the weighted earliness, tardiness and due date related costs. Although in the literature due dates are assigned without taking into consideration of weights of each job, we assigned due dates according to the importance of the customers. More important customers get closer due dates. This provides substantial improvements in penalty function terms. In this study, we used hybrid and random searches as solution techniques. Since marginal improvements of random search is high at the beginning and later genetic search is a more proper tool in searching we combined power of random and genetic searches and we used hybrid search as solution techniques.

Keywords: Process Planning, Weighted Scheduling, Weighted Due-Date Assignment, Hybrid Search, Random Search

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Earthen Structures in Cyprus and Earthquake Respons

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ABSTRACT

Architectural heritage in Cyprus is stone and earthen construction. Maintaining the heritage is mission and global strategy. The physical properties of earthen and stone constructions materials are creating healthy indoors. Regarding the climat conditions in Cyprus new buildings can be built with earthen material.

Cyprus lies within the Alpine-Himalayan seismic zone. Seismic prevention of the new bearig wall construction in Cyprus is significant. Several studies at ITU (Istanbul Technical University) has shown that horizontal “energy dissipation layers” in the wall is preventing collaps of bearingwalls. The study on shaking table will be summerised to support the decisions on new buildings of earthen constructions in Cyprus.

Keywords: earthen construction¹, seismic zone², Cyprus³, shaking table⁴, energy dissipating⁵

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Innovative Design in Test Setup System for Prognosis and Diagnosis of Mechanical Failures

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ABSTRACT

Machines are in human life in last century with increasing usage respect to industrialization. The needs determine the functionality of machines that comes with the design period. The design comes into a product in manufacturing industries equipped with high technologies. Design period and manufacturing period results in delivering and installation for the customer that depends on a significant capital. As machines are assets for the industries, sustainability of these assets is crucial in feedback of the capital and releasing losses. Nominal life cycle of the machines base on the nominal working conditions. On the other hand, each enterprise has unique working conditions, production capacity and other sources that has different effecton on machines. Rather than policy of breakdown maintenance; predictive maintenance brings much more gainings to enterprises such as preventing loss in costs, time, quality and work safety. In order to follow machine health; physical symptoms should be monitored in prognosis phase regularly and action should be taken before or in diagnosis phase.

This research is based on monitoring mechanical asset health in prognosis and diagnosis phase respect to the physical data acquisition that can be integrated to Computerized Maintenance Management System (CMMS). A unique test setup system has been designed by the inspiration from real industry and academic bodies worldwide in order to make tests and acquire physical data in prognosis and diagnosis phase for analyzing the data to monitor machine health constantly. Results of the experimental mechanical failure data by the test setup found significant for the protection of machine asset health.

Keywords: Innovative, Prognosis, Diagnosis, Maintenance, Design, CMMS

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Vibration Based Failure Characteristics With Belt Driven Radial Fan Through Artificial Defects

Salih Seçkin EROL¹

ABSTRACT

Mechanical systems are mainly constructed with a limited number of machine elements. One of these elements that is widely used is belt-pulley systems. Transmission of the motion with belt-pulley system is a coupling element between driven and driver equipment. The calibration of the belt-pulley system is crucial in order to transmit power without loss and also crucial to prevent undesired vibration levels. Highest technology in calibration of belt-pulley systems is known as laser alignment systems which are in highly cost. Vibration technique is researched in this study in order to investigate capability in calibration of belt pulley systems that can be an alternative to laser alignment systems.

In this research, a radial fan that is driven with an electrical motor with the transmission element belt-pulley is investigated under the condition of artificial defects. Sensitiveness between the failures is studied and vibration data has been captured. Vibration data have been processed with Fast Fourier Technique (FFT) and failure characteristics are determined respect to the spectrum analysis base on frequencies. Results of the tests brought significant assistance in order to categorize and identify failure characteristics for similar conditional features. Vibration data has been found informative in the calibration of belt-pulley systems that will consequence in less energy consumption and less deterioration in machine elements.

Keywords: Vibration, Maintenance, Belt driven, Condition monitoring, Mechanical failure



Redox Chemistry, Spectroelectrochemistry and Catalytic Activity of Novel Synthesized Phthalocyanines Bearing Four Schiff Bases on The Periphery

Hüseyin Karaca*

ABSTRACT

First a schiff base is synthesized by the reaction of aniline and 4-hydroxybenzaldehyde in methanol. Then 4-nitrophthalonitrile was bound to synthesized group. Then well known Pc synthesize method was used for direct synthesize of both **Pc-6** and **Pc-7** (M=Zn and Co respectively) carrying four schiff base on four peripheral positions. FT-IR, ¹H-NMR, HRMS and UV-Vis spectroscopy techniques were used to characterize the metallophthalocyanine. UV-Visible spectra showed that both Pcs are nonaggregable molecules and also well solubles common organic solvents such as dichloromethane, chloroform, THF, DMSO and DMF. Cyclic voltammograms give two reduction reaction for **Pc-6** and one reduction reaction for **Pc-7**. The spectroelectrochemical investigation shows the ring based reduction potential for MPc's. **Pc-7** cobalt(II)phthalocyanine was investigated as catalyst in the catalytic oxidation of 2-mercaptoethanol. Turnover number, initial reaction rate and the oxygen consumption was found in the catalytic oxidation of 2-mercaptoethanol as 18.6, 0.34, 2.75 respectively.

Keywords: schiff base, phthalocyanine, redox, catalysis, UV-Visible

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Effects of Topping at Different Times on Fibre Yield and Quality Traits on Cotton

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ABSTRACT

This study was conducted in the Research Fields of Faculty of Agriculture, Dicle University in 2012 in order to determine the effects of topping at different stages of growth on fiber yield and quality on cotton. In the study, cotton varieties of Primera, Deltapine 499, Stoneville 453 and Berke (*Gossypium hirsutum* L.) were used as material. The experiment was established using the in completely randomized design in split plots with 3 replications. Application times (control, 100, 115, 130 and 145 days after sowing) constituted the main parcels; the sub-parcels were cotton varieties (Primera, DP-499, STV-453 and Berke). It was determined in the study that topping done 100 and 115 days after sowing date increased the fiber length; had statistically no significant effect on characteristics such as fiber yield, fiber fineness, fiber strength, short fiber index, fiber elongation, spinning consistency index and fiber uniformity.

Keywords: Cotton, fiber quality, fiber yield, topping

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Natural Products in Medicine

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ABSTRACT

Natural products play an important role in drug discovery and development process. Most of the active ingredient of medicines included the natural products. Natural products with their derivatives and analogs represent about 50% of all drugs in clinical use, with higher plant-derived natural products representing *ca.* 25% of the total. The World Health Organization estimates that 80% of the people in developing countries of the world rely on traditional medicine for their primary health care, and about 85% of traditional medicine involves the use of plant extracts. Bioactive compounds currently extracted from plants are used as pharmaceuticals, agrochemicals, flavor and fragrance ingredients, food additives, and pesticides[1]. The secondary metabolites are known to play a major role in the adaptation of plants to their environment, but also represent an important source of pharmaceuticals.[2] Paclitaxel (Taxol), vincristine (Oncovin), podophyllotoxin (a natural product precursor), and camptothecin (a natural product precursor for water-soluble derivatives) are natural products derived from plants. These substances embrace some of the most exciting new chemotherapeutic agents currently available for use in a clinical setting.[3] Flavonoids, a large group of natural products exhibited a large variety of bioactivity including anticancer, antioxidant, antibacterial, immune-stimulating and antiviral activities.[4]

Keywords: Natural products, drug discovery, active compounds.

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Production Potential and Development Opportunities of Pistachio (*Pistacia vera* L.) Grown in Gaziantep Province (Turkey)

Mikdat Şimşek^{1*} and Ersin Gülsoy²

ABSTRACT

When Gaziantep province is mentioned of pistachio, people's mind in Turkey come pistachio because this province has the most pistachio production with 75.298 tons. Turkey has 144.000 tons of total pistachio production. Gaziantep has about 51% of Turkey's pistachio production. Gaziantep is the motherland of pistachio. In Gaziantep, pear, quince, strawberry, mulberry, walnut, apple, plum, fig, apricot, cherry, wild apricot, cherry, persimmon and olive are also grown. However, the total production of these fruits is less than the pistachios grown in this province. In this study, through presenting the existing status of the pistachio production of Gaziantep province (Turkey), it was aimed to increase the awareness and set light to decision makers for making use of and directing the existing potential in future plans in both this province and the other provinces in our country.

Keywords: Gaziantep, pistachio, production potential, development opportunity.

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Computational Fluid Dynamics and its Applications in Microalgae Bioreactor Technology: A Review

Harrison O. Tighiri*¹, Emrah A. Erkurt²

ABSTRACT

Numerical simulation studies on microalgae bioreactors have seen rapid increase. Modeling and designing of microalgae bioreactor using Computational fluid dynamics (CFD) and more powerful tools have gained much attention than before. Microalgae are considered the most promising and flexible raw material considered as the future of crops. They grow quickly, requiring only sunlight, carbon dioxide and minerals. As a result, they can produce a wide range of markets, including biofuels, pharmaceuticals, human and animal nutrition and cosmetics. However, production costs remain high, which limits their commercial use of high value-added compounds. These cost reductions can be achieved through efficient bioreactor designs that achieve high biomass productivity. CFD in this case, can play an important role in optimizing the microalgae bioreactor design, light transfer, biokinetics interactions, heat and mass transfer, and fluid dynamics analysis. This study investigates recent advances in CFD modeling of microalgae bioreactors.

Keywords: Computational Fluid Dynamics (CFD), Microalgae, Photobioreactors, Modeling, Computation Simulation

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**A specific metabolome study of plant parts, tissue, organ and cell,
employing UPLC-QTOF Mass Spectrometry and dedicated library, in
search of valuable plant metabolites.**

Sergey Malitsky^{*1}, Nir Shahaf², Asaph Aharoni³, Arye Tishbee⁴

ABSTRACT

Plants are an important part of our diet and their nutritional role and value have been known for many years.

All plants contain essential primary metabolites like, lipids, carbohydrates, and amino acids, plants also produce secondary metabolites, mainly small potent molecules like alkaloids, Steroids, flavonoids, glycosylates, peptides etc. These secondary metabolites are complex group of organic compounds that are produced by the plant, as a defense mechanism, usually as a response to interaction with environment, and are extremely valuable and unique sources of pharmaceuticals, food additives, flavors and industrially important biochemical.¹ These secondary metabolites are accumulated in the plant body parts due to external stress, therefore plant culture became an attractive alternative technology for obtaining secondary metabolites that are either difficult to synthesize chemically or are produced in limited quantities in wild plants.

The advent of chemical analyses and the characterization of molecular structures have helped in identifying many of these plants and correlating them with their activity under controlled experimentation conditions.²

Here we present the use of a unique dedicated plant metabolite library we developed, (WEIZMASS)³ and GC-MS; UHPLC –SFC- QTOF-MS systems, for the analysis of polar, non-polar metabolites from a single sample.

Enabling us to uncover and identify in high-confidence dozens of metabolites in both common and exotic plant organs, new data of metabolites not reported previously in plants or not found yet in these plants organs to date, will be presented.

Keywords: Metabolome, UHPLC-MS, SFC, QTOF.

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Magnetite loaded chitinous microcages produced from microcrustacean (*Daphnia longispina*; water flea) ephippia for Cr(VI) removal

Gulsin Arslan^{*1}, Idris Sargin², Murat Kaya³

ABSTRACT

Among the biopolymers, chitin, a water-insoluble polysaccharide, and particularly its deacetylated soluble form, chitosan, have been extensively exploited to design carriers or matrixes for biomolecules and particles. Although it has been long known that chitin occurs in the exoskeleton of freshwater microcrustaceans *Daphnia* (water flea) and chitin is the main structural part of the robust shell of their resting eggs, called ephippia. Three dimensional chitinous microcages was produced by keeping the original shape of *Daphnia longispina* eggs (water flea) chitinous structure. Then, magnetite particles (Fe_3O_4) were successfully loaded into the microcages to enhance heavy metal sorption capacity. The FT-IR, SEM-EDX and TGA analysis proved the purity of chitin and the magnetite loading into the chitinous microcages. These obtained three-dimensional chitin microcages and magnetite loaded microcages were tested in Cr(VI) removal. Magnetite loaded microcages exhibited a better performance in removal of Cr(VI) ions; while unloaded microcages showed a higher affinity. This study demonstrated that the chitin microcages are suitable carriers for waste water treatment.

Keywords: Water flea, microcages, chitin, magnetite, Cr(VI)

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Key Intermediates and Their Dynamics in Catalytic Systems for Di-, Oligo- and Polymerization of Olefins

Etibar Ismailov*, Yadigar Abbasov¹

ABSTRACT

Electron magnetic resonance (EMR) and dynamic light scattering (DLS) technique are used to study the intermediate products of the catalytic systems of di-, oligo- and oligomerization of olefins based on the azo-, azomethine complexes of Ni(II) and Co(II) with organoaluminium compounds. The paramagnetic Ni(I) and Co(0,II) complexes, superpara/ferromagnetic particles of nickel and cobalt in the conditions, similar to catalytic, are identified.

In the table dynamic light scattering data on the evolution of liquid phase catalytic system of dimerization of olefins based on the Ni(II) azomethine complex and Et₂AlCl are given. This is the first direct experimental evidence for in situ detection of supramolecular structures in catalytic systems for di-, oligo- and polymerization of light olefins. It was shown that in situ, real time monitoring of catalytic system by DLS provides useful information regarding the formation, transformation of supra-molecular structures, dynamics of their size and concentration.

Table. DLS data on the catalytic system based on Ni(II) azomethine complex.

*Sample	Diameter of particles in liquid system, nm						Span	Diffusion Coef, E ⁻¹³ m ² /s.
	Diameter for 10, 50, 90 % of particles			Median	Mean	Mode		
	10	50	90					
1,a**	1,9	2,4	2,9	2,4	2,4	2,4	0,41	356
1,b	1,8	2,2	2,8	2,2	2,2	2,3	0,43	379
1,c	1,2	1,7	2,2	1,7	1,7	1,8	0,58	502
2,a	562,1	785,5	1053,8	785,5	797,7	814,0	0,63	1,08x10 ⁻²
2,b	538,8	804,6	1109,4	804,6	816,2	823,0	0,71	1,05x10 ⁻²
2,c	528,0	794,3	1112,8	794,3	809,7	820,0	0,74	1,07x10 ⁻²
3,a	504,0	837,5	1259,3	837,5	863,4	928,7	0,90	1,01x10 ⁻²
3,b	631,3	916,2	1260,1	916,2	933,2	938,8	0,69	0,93x10 ⁻²
3,c	539,0	869,8	1242,7	869,8	882,2	932,4	0,81	0,98x10 ⁻²

*Sample 1 is the liquid solution of Ni(II) azomethine complex before the interaction with Et₂AlCl; 2,3- the liquid solution of Ni(II) azomethine complex after reaction with Et₂AlCl in the absence and presence of ethylene, accordingly. **a,b,c are the each next measurements of the same system every 3 minutes.

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THERMO-ECONOMIC COMPARISON OF GEOTHERMAL COOLING SYSTEMS WITH CONVENTIONAL SYSTEMS

Kemal Ermis^{*1}, Lokman Ilbilgi², Halit Yasar³, Tahsin Engin⁴, Mecit Sivrioglu⁵,

ABSTRACT

The demand for air conditioning has been grown rapidly with the improvement of living standard. The consumption of air conditioning plays an important role in the energy consumption. Conventional cooling systems use more electricity than the geothermal cooling system.

In this study, economic analysis is performed by comparing geothermal absorption cooling system with the other conventional cooling systems for a case study of Princess Thermal and Spa Hotel in Tukey. Also, The thermodynamic analysis of the system components and its performance coefficients (COP) has been carried out. The estimated investment and operation costs have been compared with the costs of other alternative cooling systems for the case study. This study shows that the proposed cooling system can be used for economic benefit.

Keywords: Absorption cooling system, Geothermal Energy, Economic Analysis, Thermal Analysis

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NUMERICAL ANALYSIS OF CONVECTIVE HEAT TRANSFER OF NANOFLUIDS IN A LAMINAR FLOW PIPE

Kemal Ermis^{1*}, Numan Demir²

ABSTRACT

Nanofluids are the new generation of fluids that are supposed to replace traditional heat transfer fluids. Nanofluids are usually produced by mixing metallic nanoparticles into conventional heat transfer fluids. When compared to conventional heat transfer fluids, it is expected to increase heat transfer.

In this study, heat transfer was investigated numerically in copper tube at constant heat flux, with forced convection of the nanofluid in laminar flow conditions. The effect of nanofluids on heat transfer has been investigated. As fluid, nanofluids containing nanoparticles at different volume concentrations are discussed. In this study, the variation of the heat transfer coefficient and the Nusselt number along the pipe were investigated at various particle volume concentrations and Reynold numbers. The work was carried out with Ansys-Fluent software. The results are thought to be promising.

Keywords: Nanofluids, Heat transfer enhancement, Laminar flow, Numerical analysis

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Integrated Process Planning and WSPT Weighted Scheduling with WPPW Weighted Due-Date Assignment Using Genetic and Hybrid Searches

Halil Ibrahim Demir, Ozer Uygun, Enes Furkan Erkan, Onur Canpolat ¹

ABSTRACT

Although conventionally process planning, scheduling, and due date assignment functions are performed separately, recently there are numerous works on integrated process planning and scheduling and many works on scheduling with due date assignment. Unfortunately, there are few works on the integration of these three functions. In this study, we tried to integrate process planning with weighted scheduling and weighted due date assignment. At the literature many works are on single machine scheduling problem with common due date assignment but, here we have multiple machines and multiple jobs to be scheduled on these machines and each job has alternative routes. We assign a unique date for each job and important customers get closer due dates. This provides a substantial improvement in performance functions which penalize weighted earliness, tardiness, and due dates. We used ordinary solutions, genetic search, a hybrid search which is a mix of random and genetic searches and finally random search as solution techniques. Full integration of these three functions with genetic and hybrid searches are found as the best combinations.

Keywords: Process Planning, Weighted Scheduling, Weighted Due-Date Assignment, Genetic Algorithms, Hybrid Search, Random Search.

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Synthesis of copper ion incorporated uricase-based hybrid nanoflowers and their enhanced catalytic properties

Burcu Somtürk Yılmaz^{*1}, Nalan Özdemir²

ABSTRACT

Enzyme has been unique properties due to eco-friendly nature and superior catalytic activity, high reaction specificity and low toxicity [1]. However, their efficient use is limited due to some connatural disadvantages due to being without stability, difficulty in recovery and reusability, loss of catalytic activity after administration into the reaction and high cost. In order to overcome these disadvantages, several immobilization approaches have been developed. The expectancy with enzyme immobilization is to improve both catalytic activity and stability [2]. Recently, hybrid materials, combining with the advantages of organic and inorganic components have been widely applied for enzyme immobilization because of their unique properties. Herein, we present a study on the formation, catalytic activity and stability of hybrid nanoflowers (hNFs) containing uricase and copper ions.

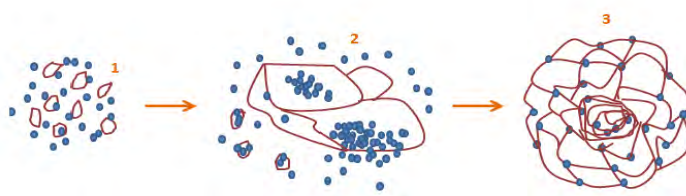


Fig. 1 Possible formation mechanism of uricase–Cu²⁺ hNF divided into three parts: (I) nucleation, (II) growth and (III) completion of the entire hNF formation. Blue dots represent the copper phosphate complex.

The proposed mechanism of hNF formation is illustrated in Fig. 1 [3]. The hNFs were characterized using SEM, EDX analysis, Bradford assay, UV-Vis spectrometry and XRD. The effect of reaction temperatures on the morphology of the hNFs was demonstrated with SEM images (Fig. 2).

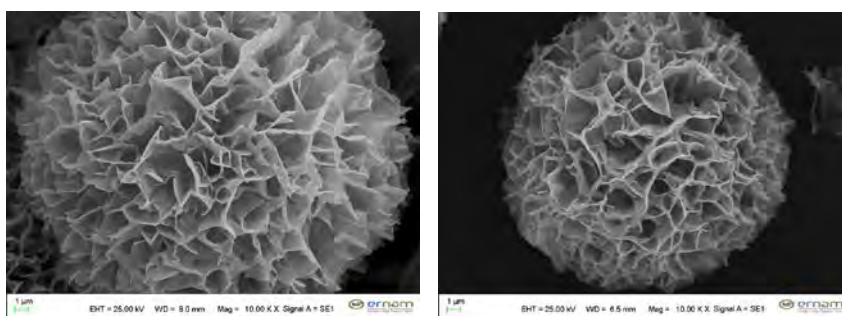


Figure 2. SEM images of hNFs synthesized at different incubation temperatures (A) +4 °C, (B) Room temperature.

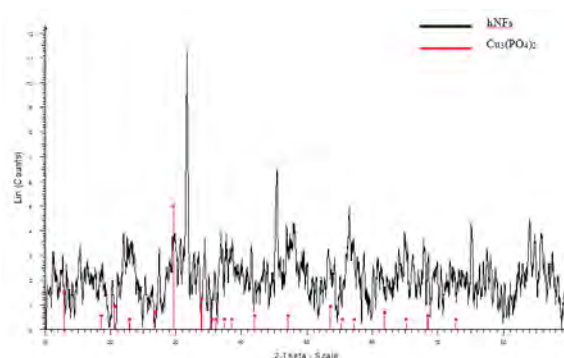


Figure 3. XRD patterns of the HNF (black line) consistent with the peak position of the $\text{Cu}_3(\text{PO}_4)_2 \cdot 3\text{H}_2\text{O}$ (red line, JCPDS (00-022-0548) located for comparison.

Keywords: uricase, nanoflower, catalytic activity

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A Case Study for Calculation of Boiler Efficiency by Using Indirect Method

Pınar Celen, Hasan Hüseyin Erdem

ABSTRACT

Boiler is one of the most important for generating steam to where it is used power generation and industrial applications. The calculation of boiler efficiency is major factor affecting thermal power plant performance. There are two methods to determine boiler efficiency: direct method and indirect method. In this study, the efficiency of a fluidized bed boiler having a steam production capacity of 462000 kg/h and 17.2 bar pressure was calculated by using indirect method. Moreover, the effect of the fuel moisture content and the excess air coefficient increase on power plant boiler efficiency is investigated..

Keywords: Boiler efficiency, indirect method, moisture content, power plant



Chitosan Containing Microcapsules For The Adsorption Of Cr(VI) Ions

Serpil Edebalı*, Büşra Erkan, Türkan Altun

ABSTRACT

Utilization of natural polymer as matrix for preparing microcapsules can improve the performance of the materials and render them environmentally friendly. Modification of biopolymers is an easy process to develop effective adsorbents for the removal of toxic metal ions from their aqueous solutions. In the present study, carob (C) was modified with chitosan and then crosslinked to the glutaraldehyde to obtain the final form (C-ch – GDA). The modified C was characterized by SEM, FTIR and XRD and investigated as adsorbents for the removal of Cr(VI) ions from their aqueous solutions. The adsorption process was carried out through the variation of time, adsorbent amount, pH and initial concentration of Cr(VI) ions. C-ch-GDA was observed to be an efficient adsorbent with a maximum adsorption capacity above its raw material. The kinetic data generated fit the pseudo-second order kinetics.

Keywords: Carob, chitosan, microcapsules, crosslinking, Cr(VI)

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Importance of Geometric Vision for Innovative Ideas in Science and Engineering

Zekâi Şen ¹

ABSTRACT

For the last three decades, the word “innovation” became frequently spelled not only in research and technology domains, but in many branches of engineering and natural sciences circles. In general sense, innovation is rediscovery, modification, improvement or development of an already known knowledge and information with addition of new visions or extensions that may lead to further methodological, technological or research directions with additional economic benefits. Such a goal has its successive rational stages among which are suspicion, imagination, geometric description (design), idea generation, discussion and criticism and final approval. Although, mathematics are thought at many education levels, but the basis of expressions, equations, algorithms or procedures are not founded on sound fundamentals. The basic fertile field for innovation should include philosophy and logical rules, which are missing in education systems. Innovative ideas do not come through systematic education only, but even each individual who is suspicious about the scientific information can bring out better ideas provided that he has rational, logical and approximate reasoning capabilities. It is emphasized in this presentation that whatever are the rational ideas even the centuries before the Christ geometry played the major role. Unfortunately, today's education systems mathematical courses are abundant without geometrical backgrounds and principles. In this presentation it is advised that the innovative ideas cannot be reached by Euclidian geometry or physical object shapes but also imaginative shapes of any thought in the mind.

Keywords: Engineering, innovation, geometry, logic, philosophy, science.

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ANTIOXIDANT, ANTIBACTERIAL, ANTIFUNGAL AND CYTOTOXIC PROPERTIES OF SYNTHESIZED BENZALDEHYDES

Metin Konuş*, Aslihan Kurt Kızıldoğan, Pembegül Uyar, Arif Kıvrak, Can Yılmaz

ABSTRACT

Benzaldehydes are cyclic compounds that can show several effects such as antimicrobial effect, cytotoxic, antioxidant and anticancer activity. Benzaldehyde derivatives, namely 5-bromo-2-(prop-2-yn-1-yloxy)benzaldehyde (a) and 3,5-di-tert-butyl-2-(prop-yloxy)benzaldehyde (b), were synthesized synthetically. Then, antioxidant, antimicrobial, antifungal and cytotoxic properties were determined with different methods. Antioxidant properties were analyzed by DPPH and ABTS assays. In order to determine antimicrobial effect of them, disc diffusion and minimum inhibitory concentration (MIC) assays were used. Furthermore, their cytotoxic effects were tested with XTT assay.

It was determined that while 1 mg of compound a had an 0,7 µg trolox equivalent antioxidant capacity, 1 mg that compound b had an 2,9 µg trolox equivalent antioxidant capacity in DPPH assay. Similarly, it was determined that while 1mg compound a had an 3,21 µg trolox equivalent antioxidant capacity, 1 mg that compound b had an 16,7 µg trolox equivalent antioxidant capacity in ABTS assay.

According to the disc diffusion and MIC assays results, both derivatives exerted weak to intermediate level of antibacterial activity against *B. subtilis* with a MIC value of 64 µg/ml. However, MIC values of 256-512 µg/ml were recorded for other indicator bacteria tested. As for antifungal activity, both derivatives showed intermediate level (MIC: 32 µg/ml) of antifungal effect on *A. niger*, while they showed a very low level of inhibitory effect on *C. albicans* (MIC: 256 µg/ml).

In addition, it was determined that compound b ($EC_{50}=40,1$ µg/ml) showed more cytotoxic effect through MCF-7 cells than compound a ($EC_{50}=173,5$ µg/ml) according to the XTT assay results.

Keywords: Antioxidant, Cytotoxic, Antimicrobial, Antifungal and Benzaldehyde Derivatives

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Shaping the Future of the Water Industry Breakthrough Technology in Water Desalination and Waste Water Treatment

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ABSTRACT

“New Environmental Problems cannot be solved with Old Techniques”

The vast industrial boom around the world have resulted in new environmental problems, in addition, to the existing chronicle ones. Using the old techniques to overcome these problems in most cases is not practical nor economical. The innovation pace is not matching the pace of the new environmental issues and their impact on the different aspect of mankind.

Third Direction Consulting, a Saudi base company and their technical partners Meyah Environmental Engineering and Consulting a Singaporean company have strived over the past few years to introduce innovative and economical solution to the water and waste water industry. The company have filed 14 patents in the field of water desalination and water treatment over the past two years.

Third Direction Consulting will share two innovative solution for water desalination and industrial waste water treatment. The first innovation is Green Liquid Discharge (GLD) which is a breakthrough technology in water desalination that will reshape the entire industry. This innovative solution will have enormous impact from economical, environmental point of view. The technology is environment friendly and will make water desalination extremely economical compared with any existing technology.

The Second patented Innovative solution is the OFR Technology. With this technology the Hydroxyl Radicals is generated by our specially designed and patented equipments to handle the most difficult contaminants without introducing chemicals that would have adverse effect on the environment.

Keywords: Water Desalination, Water Treatment, GLD, OFR

References

It is a brand new technology there is no references about it yet.



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Theoretical Investigation of Correlation, Quantum Electrodynamics and Breit Effects on The Energy Levels of Ca-Like Tungsten

Gülay Günday Konan^{1*}, Leyla Özdemir²

ABSTRACT

We have investigated the electron correlation effects, Breit interaction and Quantum electrodynamics (QED) effects on the energy levels of Ca-like tungsten (W^{54+}) using AUTOSTRUCTURE code developed by Badnell. All these effects are of great importance in heavy highly charged ions. In this work, the results obtained have been discussed and compared with other works.

Keywords: Energy levels, Correlation effects, Relativistic effects, QED

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The curves of parameters having economic importance in conventional milk during winter and spring season

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ABSTRACT

This study was aimed to investigate the milk parameters having economic importance such as fat and protein in conventional milk during winter (January, February) and spring (March, April, May) season. Milk data was collected from a milk company in Batman province during winter and spring period. The protein level of March month was statistically higher than that of other months. Milk protein levels were similar between the other months. The milk fat was secreted at its highest rate at the start of year (January) and then declined until March month and it remained stable from March to April. A decrease in milk fat rates was seen again after April month and the resistance to decline of milk fat rates was low during winter and spring months. Suitable roughage intakes to increase the production of milk fat are essential for achieving the economic benefits during winter and spring period.

Keywords: Milk, conventional, winter, spring, economic

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Incompatibility of oils as a violation of stability during their mixing

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ABSTRACT

The report presents the results of a study on violation of stability of the oils with a various origins during the mixing using dynamic light scattering in combination with the methods of electron spectroscopy in the ultraviolet and visible regions of the spectrum, electron magnetic resonance and measurements of viscosity and density. It should be noted that the successful development of technologies of the extraction, preparation, transportation of oil requires consideration of the colloid nature of the oil, involving accurate and reliable methods for quantitative analysis not only the elemental composition, but also for adequately describing the molecular, supramolecular structure of the oil. The main goal of the research is to analyze the reasons for oil incompatibility during the mixing the oils with different composition and violation of their stability and also to develop a technology to prevent undesirable deposits in the pipeline system: paraffins, resins, asphaltenes, etc. The report presents the results of studies of the incompatibility of oils of the southern region of Azerbaijan.

The dynamic light scattering in combination with magnetic resonance (EPR, NMR), UV/Vis methods and measurements of the viscosity and density was used to study the composition, chemical-physical parameters of the noted above oils and the dynamics, stability of these oils, asphaltene, asphaltene-tar-paraffinic structures during the mixing of oils with different compositions, to investigate the kinetics of their aggregation as a function of their concentration, composition of oil and the temperature of the measurement.

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THE INVESTIGATION OF GEOMETRIC AND ELECTRONIC PARAMETERS OF THE ESSENTIAL OIL OF *CAPPARIS SPINOSA L.* BY USING DFT

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ABSTRACT

Capparis spinosa, medicinal and aromatic herb in plants of Capparidaceae family, is largely distributed all over the Mediterranean Basin and is known as gebre, kebere, kapari in Turkey. It is traditionally used to treat many illnesses, such as liver and kidney diseases (Tlili et al. 2017). GC-MS analysis of the volatile oil constituents of the aerial parts of *Capparis spinosa* resulted in 24.66% methyl isothiocyanate and 12.44% isopropyl isothiocyanate as the major constituents in Egypt (Bakr and El Bishbishy 2016). The structural geometric parameters and electronic properties of the ground state of the methyl isothiocyanate have been calculated by using density functional methods (DFT). In addition, the frontier molecular orbital descriptors and the molecular electrostatic potential surface of the title molecule have been investigated with the Gaussian 09W software package.

Keywords: Essential oil, *Capparis spinosa L.*, methyl isothiocyanate

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DETERMINATION OF STRUCTURAL AND ELECTRONIC PARAMETERS OF THE ESSENTIAL OIL OF A *OCIMUM BASILICUM L.* BY USING DFT METHOD

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ABSTRACT

Ocimum basilicum L. is a precious essential oil and medicinal and aromatic herb in plants of Lamiaceae family. The chemical composition of the essential oil of *Ocimum basilicum L.* has been known to have antioxidant, antibacterial, antimutagenic, anticarcinogenic activities, anti-inflammatory, neuro-protective actions, etc. properties (Skendi, Irakli, and Chatzopoulou, n.d.; Werker 1993; Moghaddam et al. 2014). Padalia et al. (2017) reported that essential oil of the *Ocimum basilicum L.* consists of methyl chavicol (56.1–89.7%) and linalool (1.0–33.7%) as the major constituents (Padalia et al. 2017). The structural parameters (bond length, bond angle and torsion angle) and electronic properties of the ground state conformer which belong to methyl chavicol were calculated by using density functional methods (DFT). The molecular electrostatic potential surface and frontier molecular orbital descriptors of the title molecule have been investigated with the Gaussian 09W software package.

Keywords: Essential oil, *Ocimum basilicum L.*, methyl chavicol

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Preparation of chitosan-damson plum kernel shell (C-DPKS) and alginate-damson plum kernel shell (A-DPKS) nanocomposite materials and these investigate of adsorption capability for Chromium(VI)

Türkan Altun, Serpil Edebali

ABSTRACT

To make it more effective natural adsorbents, nanocomposites can be prepared. Functional groups within the structure of chitosan (as hydroxyl (-OH) and amino (-NH₂)) and alginate (as carboxylate (-COO-)) leads adsorbents to have a binding potential with heavy metals. In this study, nanocomposites of damson plum kernel shell (DPKS) natural adsorbent with chitosan and alginate were prepared. Chitosan-damson plum kernel shell (C-DPKS) and alginate-damson plum kernel shell (A-DPKS) nanocomposites were characterized FTIR analysis. Adsorption examinations of Cr(VI) with nanocomposites was performed in batch pots. The nanocomposites prepared were add to slowly in the previously prepared Cr(VI) solution and mixed in the pots in a certain time until equilibrium reached. The effects of initial Cr(VI) concentration (10-260 ppm), pH of solution(1-7), adsorbent dosage(0,01-0,1 g) and time on the equilibrium(0-240 minute) were studied. The adsorbed dosage of Cr (VI) ions decreased with increasing pH of solution, however increased with increasing contact time. Freundlich, Langmuir and Dubinin-Radushkevich (D-R) adsorption isotherms were applied to test the suitability of experimental data. Adsorption parameters (n, k, K_b, A_s, K, X_m, E) were calculated from these isotherms. Optimum conditions for Cr(VI) adsorption with nanocomposites were investigated and all the experiments were worked with obtained optimum values. The amount of Cr(VI) in the aqueous solution was evaluated using UV-visible Spectrophotometer. The results showed that C-SCKS composite could be used as an alternative to commercial adsorbents for the adsorption of Cr (VI) ions and C-DPKS, A-DPKS are an environmentally-friendly adsorbent.

Keywords: Adsorption, chitosan, alginate, nanocomposite, adsorption isotherm, Cr (VI), damson plum kernel shell

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Mobilizing With Organic Humic Substances in The Marmara Region Forest Areas; Evaluation Of Vegetation Type, Annual Precipitation Amount And Water Dependent Change By Algorithm Hierarchical Cluster (Ahc)

Method

Ali GÜREL, Mehmet ALAN², Betül UYGUR ERDOĞAN³, Mehmet ÖZDEMİR⁴, Ayhan HORUZ⁵, Ahmet TUTAR⁶ ¹

ABSTRACT

The Marmara Region (Kocaeli and Sakarya) was studied in *F.orientalis-R.ponticum* and *C.sativa-F.orientalis-R.ponticum* vegetation in the forested areas. Humus and soil samples were taken from 18 experimental sites, 3 replicates from soil horizons with 3 different loci (O₂) in both vegetation types. Vegetation types were determined in the PC ORD vegetation analysis program, taking advantage of the coverage rates according to the Braun Blanquet method of plant species in the sample areas. The temperature values of the sample points in the study area are calculated using the Lapse-rate formula using annual values determined for the Marmara Region. The Shreiber formula ($Y_h = Y_o \pm 54 * h$) was used to determine the precipitation values of the sample points in the study area. The annual water balance of the locations is based on the Thornthwaite method. Statistical evaluations of mobilization with humic substance compositions in humus (O₂) and soil (A₁) horizons depending on annual mean precipitation amount and water balance of different types of vegetation types were made by using Algorithm Hierarchical Cluster (AHC) method. As a result of this study, important data about organic matter management according to vegetation type and water balance have been obtained in forest ecosystems.

Keywords: : Humic Substance, Vegetation Type, Water Balance, Organic Matter Management, AHC.

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Preparation and Characterization of Horse Radish Peroxidase-Zn²⁺ Hybrid Nanoflowers

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ABSTRACT

In the literature, there are lots of reports about protein-inorganic hybrid nanoflowers. Most of these studies focused on protein-Cu²⁺ hybrid nanoflowers. It is known that, the selection of biomolecules and its corresponding metal ions plays a important role in formation of hybrid nanoflowers. And different metal ions can form hybrid nanoflowers of the same biomolecules with different functional properties. The composition and morphology of the enzyme-inorganic hybrid nanoflowers strongly dependent on the incubation time, precursors concentration (metal ions, protein etc.) and synthesis pH.

In this study, using Zn²⁺ ions, unlike Cu²⁺, hierarchical flowerlike horse radish peroxidase-Zn²⁺ (HRP-Zn²⁺) hybrids were synthesized according to published methods, with slight modifications using horse radish peroxidase (HRP), Zn²⁺ ions aqueous solution, and phosphate buffered saline. Then the synthesised HRP-Zn²⁺ hybrid nanoflowers were characterized using some techniques (SEM, EDX, XRD etc.).

This study is supported by a grant (Project Number: FYL-2017-7495) from Scientific Research Projects Committee of Erciyes University.

Key words: Enzyme immobilization, hybrid nanoflower, horse radish peroxidase, Zn²⁺ ions,

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INVESTIGATION OF ADSORPTION ON SOME INORGANIC IONS AND KOLESTEROL

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ABSTRACT

In this study; It was aimed to remove organic substances such as Na +, K +, Mg²⁺, Ca²⁺ inorganic ions and cholesterol from the solution medium by adsorption method using active surface centers, clay layers and pores of the clay mineral. The clay type which was brought from Tutmaç Village of Güzelsu District of Van Province, Gürpınar District, has been determined. The clay sample was dried and milled on to prepare 400 mesh (0.038 mm) for adsorption experiments. In Experimental work as adsorbate were used Na +, K +, Mg²⁺, Ca²⁺ inorganic ions and cholesterol as the organic substance. As a result of our experiments, it was found that organic compounds such as Na +, K +, Mg²⁺, Ca²⁺ inorganic ions and cholesterol were adsorbed from the clay solution medium. Chemical analyzes of adsorbates were carried out by using spectroscopy methods and the amounts of equilibrium in the solution medium were analyzed by AAS and UV instruments.

Keywords: Adsorption, Tutmaç Clay, Magnesium, Cholesterol

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**EFFECTS OF USING GHEE AND OLIVE OIL ON CHEMICAL, TEXTURAL, AND
SENSORIAL PROPERTIES OF CHOCOLATE SPREADS***

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ABSTRACT

In this research, it was intended to develop chocolate spreads by using ghee and olive oil. Six types of chocolate spreads, two of them is control sample, were produced and cocoa butter was substituted with ghee as a proportion of 0%, 0.75%, 1.5%, and 2.25% as order in the chocolate spreads which was produced with ghee and olive oil. Produced chocolate spreads were filled in glass jars and stored for 180 days. On the 3rd, 90th and 180th days samples were taken from chocolate spreads and moisture, pH, titratable acidity, free fatty acids, peroxide value, color (L*, a*, b*), fatty acid profile, texture analysis and sensory analysis were carried out.

The results obtained were compared statistically in terms of the chocolate spread variety and storage time. There was a significant difference at $P<0.01$ level for moisture content, pH, titratable acidity, free fatty acids, peroxide value and texture results in terms of the type of chocolate spread and storage time. According to the color measurements there is no significant difference in terms of the chocolate spreads variety ($P<0.05$), and there is a significant difference in terms of storage time at $P<0.01$ level. According to the results of the weighted evaluation of sensory analysis, the difference is significant ($P<0.01$) in terms of the spreadable chocolate variety, and is insignificant ($P>0.05$) in terms of storage time. According to the results of fatty acid profile analysis, the difference for contents of capric acid, lauric acid, palmitic acid, palmitoleic acid and linoleic acid is significant at $P<0.01$ level and the difference for content of linolenic acid is significant at $P<0.05$ level in the terms of chocolate spread variety. The difference for other fatty acids is insignificant.

According to the results of the sensory evaluation made by the panelists, ghee and olive oil, included chocolate spreads are more popular. It seems that 1.5% cocoa butter substituted chocolate spread has taken most liking. It was observed that the elapsed time of storage decreased the scores of 1.5% and 2.25% cocoa butter substituted chocolate spreads, and the highest score on the 180th day was found for 0.75% cocoa butter substituted chocolate spread.

Keywords: Chocolate Spread, Ghee, Olive Oil, Fatty Acid Profile, Sensory Analysis

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A New Solid-State Phosphate Ion-Selective Electrode Based On Silver-Polygluteraldehyde Phosphate

Ozlem TAVUKCUOGLU*¹ and Ibrahim ISILDAK²

ABSTRACT

An all solid-state phosphate ion-selective electrode has been developed by constructing a membrane layer of silver-polygluteraldehyde phosphate, silver (I) sulfide, copper (I) sulfide, epoxy and modified graphite. The phosphate ion-selective electrode response was based on the reaction between silver-polygluteraldehyde phosphate and hydrogen phosphate ions (HPO_4^{2-}) in alkaline conditions (Yinhua et al). We found that the electrode showed a near Nernst characteristics with a slope of -28 ± 1.0 mV/decade. Potential linear range was from 10^{-1} M to 10^{-5} M and detection limit was $4,7 \times 10^{-5}$ M in the pH of 8.5. The short response time for HPO_4^{2-} -ions indicates its fast response characteristic. Compared with a PVC matrix phosphate ion-selective electrode, the all solid-state phosphate ion-selective electrode was superior in terms of hardness and mechanical strength of the membrane and long life (Ganjali et al). Phosphate ion-selective electrode developed here can be used over a period of three months with good reproducibility and sensitivity. The manufacture process of the ISE is easy and inexpensive. It can be applied to quantitative analysis of phosphate in nutrient solutions used at hydroponic plant growing mediums.

Keywords: Phosphate electrode, Silverpolygluteraldehyde, Potentiometric detection, Nutrient Solutions, All solid-state

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Synthesis, Characterization and Computational Studies of N'-(4-carboxybenzylidene) nicotinohydrazide

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ABSTRACT

The chemistry aroylhydrazones derived from nicotinic acid hydrazide has been intensively studied due to their biological and physico-chemical properties and applications. Nicotinohydrazides possess antimycobacterial, antiviral, antimicrobial (Narang et al., 2012), anticonvulsant (Sinha et al, 2011), insecticidal (Deshmukh et al., 2012) activities. In the present study, a new hydrazone derivative compound, N'-(4-carboxybenzylidene) nicotinohydrazide, $C_{15}H_{11}N_3O_3$, is synthesized and characterized by elemental analysis, Fourier-transform Infrared (FT-IR) and Fourier-transform Raman (FT-Raman), and, 1H , ^{13}C NMR and UV-vis.spectroscopy techniques. Molecular geometry, vibrational wave numbers, frontier molecular orbital and non-linear optical (NLO) property of the title compound have been calculated using *ab initio* Hartree-Fock (HF) and Density Functional Theory (DFT), employing B3LYP functional at 6-311++G(d,p) basis set. 1H and ^{13}C NMR chemical shifts were calculated by using the gaugein dependent atomic orbital (GIAO) method at the HF and B3LYP methods with different basis sets. In addition the highest occupied molecular orbital (HOMO) and the lowest unoccupied molecular orbital (LUMO) have been obtained from DFT LSDA methods with 6-311++G(d,p) basis set. The NLO behaviour of the title compound has been studied by determining the electric dipole moment (μ) and hyperpolarizability (β) using both B3LYP / 6-311++G(d,p) and HF/ 6-311++G(d,p) methods. The energy gap ($\Delta E_{gap} = E_{LUMO} - E_{HOMO}$) of title molecule have been calculated at 4.21 with DFT-B3LYP/ 6-311++ G (d,p), at 2.82 DFT-LSDA/ 6-311++ G (d,p) and at 9.82 eV HF / 6-311++ G (d,p) level of theory, respectively. The observed value of energy gap is 2.827 eV. All computational studies have been performed with the Gaussian 09W program.

Keywords: Aroylhydrazones, Nicotinohydrazides, Molecular geometry, NLO, Hyperpolarizability

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Voltammetric determination of pendimethalin with nafion-graphene modified glassy carbon electrode and glassy carbon electrode

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ABSTRACT

Pendimethalin(3,4-dimethyl-2,6-dinitro-N-pentan-3-yl-aniline) is a dinitroaniline group pesticide[1-2]. Pendimethalin is used as a selective herbicide for the control of broad-leaved weeds(corn, potato, rice, cotton, soybeans, tobacco, peanuts and sun- flowers) and grass weed species in tobacco, tomatoes and cereals[3-4]. In this study, voltammetric behaviors of pendimethalin were examined using glassy carbon electrode (GCE) and nafion-graphene modified glassy carbon electrode (n-GR/GCE). Electrochemical characterization of pendimethalin was determined by cyclic voltammetry (CV). Differential pulse voltammetry (DPV) was employed in determination studies with GCE of pendimethalin and differential pulse adsorptive stripping voltammetry (DPAdSV) in the studies with n-GR/GCE. In the experimental studies of pendimethalin, first of all, optimal experimental conditions with GCE and n-GR/GCE were established; then calibration graphics were created and working ranges were identified. The calibration graphic of pendimethalin created by means of DPV method with GCE working ranges as 1.56×10^{-6} - 1.08×10^{-3} M and the limit of detection (LOD) value was found as 3.09×10^{-5} M for 1.peak. For 2 peak, working ranges as 1.56×10^{-6} - $9,73 \times 10^{-4}$ M and the limit of detection (LOD) value was found as 3.36×10^{-6} M.The calibration graphic of pendimethalin created by means of DPAdSV method with n-GR/GCE working ranges as 1.76×10^{-6} - 4.01×10^{-4} M and 8.12×10^{-6} - 2.18×10^{-3} M and the LOD value was found as 8.69×10^{-6} M. For 2 peak, working ranges as 1.96×10^{-9} - 7.53×10^{-4} M and the limit of detection (LOD) value was found as 8.1×10^{-9} M. Interference effects of the metal ions on the analysis of pendimethalin were studied in the presence of major interferents such as Ca^{2+} , Co^{2+} , Pb^{2+} , Cu^{2+} , Ni^{2+} .

Keywords: Pendimethalin, Electroanalysis, Nafion, Modified electrode, Graphene

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Experimental and Computational Studies of Structural, Electronic and Non-Linear Optical Properties of 2,3-, 2,4-, 2,5-, 2,6-Difluorophenylboronic Acid Molecules

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ABSTRACT

In this study, 2, 4-difluorophenylboronic acid molecule have been characterized by Fourier-transform Infrared (FT-IR) and Fourier-transform Raman (FT-Raman), and, ¹H, ¹³C nuclear magnetic resonance (NMR) and UV-Vis. spectroscopy techniques. Density Functional Theory (DFT), using B3LYP functional and *ab initio* Hartree-Fock (HF) calculations have been performed to characterize the ground state geometrical energy, the dipole moment (μ), mean polarizability (α), the total first static hyperpolarizability (β), highest occupied molecular orbital (HOMO) and the lowest unoccupied molecular orbital (LUMO) of 2,3-difluorophenylboronic acid (**I**), 2,4-difluorophenylboronic acid (**II**), 2,5-difluorophenylboronic acid (**III**), 2,6-difluorophenylboronic acid (**IV**) molecules using the 6-311++G (d,p) basis set. ¹H and ¹³C NMR chemical shifts were calculated by using the gaugein dependent atomic orbital (GIAO) method by using the DFT with B3LYP functional and HF methods, where the 6-311+G (2d, p) and 6-31G (d) basis sets were employed. All computational studies have been performed with the Gaussian 09W program. In addition, using the calculated the highest occupied molecular orbital energies (E_{HOMO}) and the lowest unoccupied molecular orbital energies (E_{LUMO}), electronic properties of the studied molecules such as energy gap ($\Delta E = E_{\text{LUMO}} - E_{\text{HOMO}}$), chemical potential, electrophilic index, ionization potential, electron affinity, electronegativity, molecular softness, molecular hardness were obtained. The energy gap ($\Delta E_{\text{gap}} = E_{\text{LUMO}} - E_{\text{HOMO}}$) of **I**, **II**, **III** and **IV** molecules have been calculated at 5.717, 5.998, 5.546 and 5.579 eV with DFT-B3LYP/6-311++ G (d,p), and 10.668, 10.787, 10.613 and 10.824 eV with HF/6-311++G (d,p) level of theory, respectively.

Keywords: 2,3-difluorophenylboronic acid, 2,4-difluorophenylboronic acid, $E_{\text{LUMO}} - E_{\text{HOMO}}$, DFT, HF.

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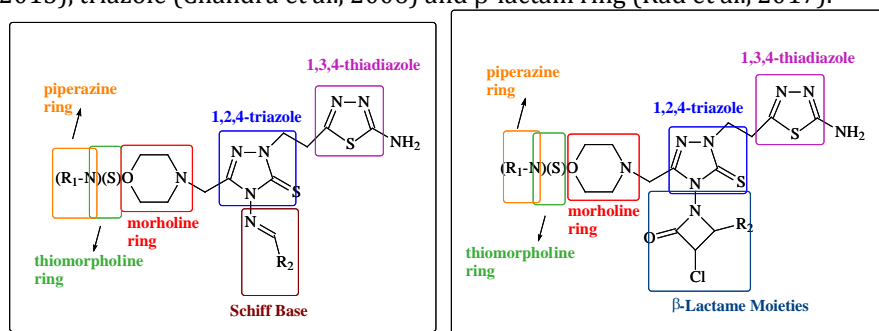
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Synthesis of New Hybrid Molecules Containing β -Lactam Ring, and Screening for their Antimicrobial, Antioxidant, Anti Ureas & Acetylcholinesterase Activities

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ABSTRACT

The need of synthesis of new derivatives of the drug compounds are very important because of the treatment results show the resistance of the microorganisms for corresponds to the effective value of the drugs which are currently used. Therefore, it is very important to design and synthesis new antimicrobial hybrid molecules which is combined with known increasing biological activity to block the microorganism resistance. Thus, in the obtained hybrid molecules each of the pharmacophore groups interact with different target group. And the synergistic antimicrobial combination has many advantages such as, to slow the development of resistance, to provide a wider spectrum of action, to low toxicity and reduction of the dose used. In the recent years, most are based on an analog basis of the work in this area and about two-thirds of the available drugs are obtained by modification of a drug known or optimization. With this in this study new hybrid compounds were synthesised containing different pharmacophores such as, morpholine (Heeres et al., 2010), thiomorpholine (Pulipati et al., 2016), piperazine (Tomar et al., 2007), Schiff base, oxadiazole (Taha et al., 2016), thiadiazole (Dawood et al., 2015), triazole (Chandra et al., 2006) and β -lactam ring (Rad et al., 2017).



All newly synthesised compounds were screened for their antimicrobial activity, antioxidant activity, anti urease and acetylcholinesterase capacity.

Keywords: Morpholine, Thiomorpholine, Piperazine, Oxadiazole, Thiadiazole, Triazole, Schiff Base, β -Lactam.

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The Investigation of Using of Sodium Chlorite (NaClO_2) in The Treatment of Textile Wastewater

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ABSTRACT

The wastewater discharged by some of our industries is harmful to human health [1]. The textile industry is one of the most water consuming industrial sectors, as well [2]. The science world has been developing new methods to eliminate the toxic properties caused from process chemicals and dyes of textile wastewaters with economically sustainable [3]. If we consider that the share of the textile industry in industrial production is very wide in our country, the necessity of the treatment of textile waste water becomes important. Today environmental pollution problems caused from the paint used in textile industry are due to azo dyes in particular [4]. As a result, pollution problems arise from the spreading of these non bio-degradable products in the environment [5]. Although various technologies are available such as biodegradation, sorption, electrochemical degradation and photocatalytic degradation [6,7] oxidative degradation via catalytic chlorine dioxide oxidation are known to be a very attractive and powerful method in the treatment of wastewater containing azo dyes [8, 9]. Chlorine dioxide produced from sodium chlorite has been used commercially for the first time as an oxidizing agent for bough bleaching and water disinfection/treatment [10]. Chlorine dioxide is highly toxic and therefore requires very careful handling [11].

In this study, oxidative bleaching which is known as chemical treatment method for colored textile wastewaters has been investigated. ClO_2 (chlorine dioxide) has been used as an environmentally friendly chemical to remove the color of the textile wastewater by using catalytic oxidative bleaching technique. It was aimed to bleach the color of textile wastewater with chlorine dioxide obtained in situ during the bleaching process using NaClO_2 (sodium chlorite) as the reagent and phosphate. For this purpose some largely used commercial textile dyeing materials have been supplied, and the studies have been carried out. NaClO_2 was added at different concentrations of 375, 750, 1500 and 3000 ppm for the colored samples and the color changes in these solutions were observed against the time at 25-50 °C at pH: 3.6 and 4.5 when the reactions catalyzed. PNR-396-BE and $\text{MnCl}_2 \cdot \text{H}_2\text{O}$ as the catalysts and phosphate buffers for tuning the pH were used. Measurements were made in UV-Vis spectrophotometer at a range of 200-800 nm. The wave lengths to be measured were determined

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from the UV-Vis spectra of the bleached dye sample and the color values were expressed in Pt-Co (platinum cobalt) according to the 'Waste Water Discharge Regulation' color parameter.

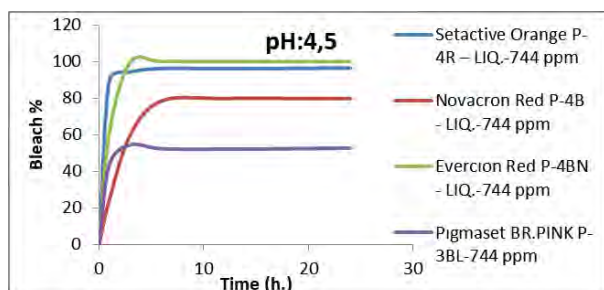


Fig. 1. 750 ppm NaClO₂, 0.48 ppm PNR-396-BE catalyst, 50°C.

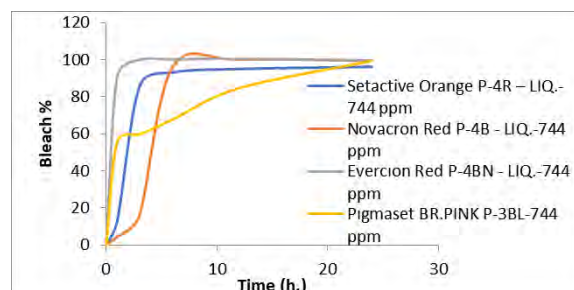


Fig. 2. 750 ppm NaClO₂, pH: 4.5 buffer, 50°C.

We can say from the evaluation of these studies that, by optimizing the amount of NaClO₂ dosages and catalysts for satisfying the environmental conditions according to the characteristics of the textile effluents, it is possible to bleach the colored waters below the required Pt-Co value to conform to the wastewater specification. The results obtained in these studies can be adapted to the operating conditions and the possibility of being used in wastewater color improvement processes is able to put forward.

Keywords: NaClO₂ (sodium chloride), catalytic bleaching, textile dye removing, wastewater treatment.

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Determination of the Critical Buckling Load of Columns with Variable Cross-Section by Using the Method of Power Series

1st Ayşe Polat Yazıcı*¹, 2nd Fuad Okay²

ABSTRACT

There are several types of buckling in structural mechanics. The most simple case is the flexural buckling of columns. In general way of thinking, buckling can be defined as losing the stability of a column under compression. The problem was first studied by the Swiss mathematician Leonhard Euler in 1757. He derived a linear differential equation with constant coefficients, from the buckled shape of pin-pin ended column and achieved the solution of the problem by using the method of undetermined coefficients. The reason for that is the mentioned method is simply good for columns that have constant cross-section, even with different end conditions.

However, for the cases with variable cross-section, the governing differential equation comes out with variable coefficients and consequently method of undetermined coefficients becomes insufficient for using the problem.

The authors propose the solution using the method of power series for determining the buckling load of variable cross-section columns. The method is checked for constant cross-sectional columns for two different end conditions. It is observed that the series converge rapidly and give rather satisfactory accurate solutions.

Thus, it can be concluded that the method is viable for determining the critical loads of columns with variable cross-sections, in the forthcoming stages of the study. A case for a nonuniform column is also investigated in the study.

Keywords: Buckling, Nonuniform columns, Power Series Solution, End Conditions, Modes

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Copper and Humic Acid Interaction in Cucumber (*Cucumis sativus L.*) Plant

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ABSTRACT

The aim of this study is to determine the effects of Cu x HA interaction on the plant fruit yield, plant dry weight and plant height. For this purpose, 2 treatments Cu (0 and 5 ppm) with CuSO₄.5H₂O and 5 treatments HA (0, 100, 200, 400 and 800 ppm) which contains pure liquid HA at 15% obtained from leonardite were applied according to the factorial experiment in a randomized complete block design with 3 replicates. According to variance analysis, while increasing doses of HA without and with copper decreased plant yield and plant height in cucumber, DW and stem+leaf Cu content increased significantly (P<0,05). Humic acid Cu interaction was found to be significant in plant yield at 1% level, while it was found significant in plant height at 5% level. The highest fruit yield was found as 638,29 g/plant in control dose without copper, plant dry weight was found as 31,10 g/plant in 5ppm Cu+100 ppm HA dose, plant height was found as 129 cm in control and stem+leaf Cu content was found as 7,27 ppm in 5 ppm Cu+400 ppm HA dose. According to the results obtained, while increasing HA increased the Cu content of cucumber up to 200 ppm without copper and up to 400 ppm HA dose with copper, it was found that humic acid applied in higher dose decreased plant yield and decreased the stem+leaf Cu content. As a conclusion, too much humic acid should not be applied on soils; otherwise, plants may be exposed to the risk of Cu deficiency.

Key words: Humic acid, Copper content, Cucumber, Fruit yield, Growth

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Effect of Silicic Acid on Some Macro and Micro Nutrients in Tomato Plant Leaf in NaCl Stress Conditions Under Solid Media Culture

Ahmet Korkmaz^{*1}, Arife Karagöl², Güney Akınoğlu³, Abdulkadir Sürücü⁴, Ayhan Horuz⁵

ABSTRACT

The aim of this study is to determine the effect of silicic acid on the nutrient contents of tomato plant (Tybiff Aq seed variety) leaves under increasing stress conditions of sodium chloride (NaCl). Nutrient solutions were prepared adding 0.0, 0.5, 1.0 and 2.0 mM silicic acid at 0, 44.4 and 70.4 mM level of NaCl doses. The experiment was carried out in 1:1 peat:perlite mixture which put in each 3-liter pot as 770 grams basing on 3x4 factorial experimental design with 3 replications. The nutrient solution containing macro and micro element was applied daily as 100 ml from planting to the flowering period; as 200 ml from fruit blooming to harvest. The effects of silicic acid on the leaf nitrogen and phosphorus content were not found to be significant, on the other hand they were significantly increased at high doses of NaCl (70,4 mM). The effects of silicic acid and NaCl in the leaf magnesium content were found to be negligible. Because of NaCl supplement, the leaf sulphur content decreased significantly; on the other hand, the content of sulphur in the leaf has significantly increased at the dose of 1.0 mM silicic acid. The content of iron in leaf has significantly increased with silicic acid. The effect of NaCl was not found to be significant. As the NaCl dose increased, Mn content in the leaves of the plants showed a decrease, whereas it has significantly increased at the dose of 1.0 mM silicic acid. The effects of silicic acid and NaCl on the zinc content in the leaf were not found to be significant but the silicic acid significantly reduced the copper content in the leaf, at 0 and 44.4 mM levels of NaCl dose, but it increased significantly at 70.4 mM the level. Silicic acid supplement with NaCl at 44.4 mM level did not significantly affect to the boron content of the leaves. However 1 mM silicic acid that added in 70.4 mM of NaCl dose was significantly increased the boron content in the leaves.

Keywords: Tomato, Solid medium culture, NaCl, Silici Acid, Nutrient content.

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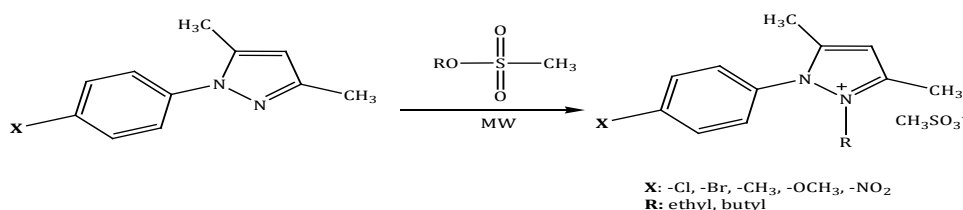
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1-aryl-2-alkyl-3,5-dimethylpyrazolium based tunable aryl alkyl ionic liquids

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ABSTRACT

Ionic liquids (ILs) are organic molten salts with melting points below 100 °C. Owing to their remarkable properties, they have been widely used for various applications as environmentally benign alternative to volatile organic solvents over the last decade [1,2]. In recent years the new generation of ILs called tunable aryl alkyl ionic liquids (TAAILs) has drawn attention for modifying the properties of ILs for specific applications [3,4]. Unlike commonly known alkyl substituted ILs the properties of TAAILs can be tuned with inductive, mesomeric and steric effects. In this study, ten new tunable aryl alkyl pyrazolium methanesulfonate ionic liquids were synthesized under microwave (MW) irradiation and characterized. Eight of the salts can be classed as room temperature ionic liquids (RTILs). The synthesized ionic liquids have a high thermal stability up to 284.93 °C. It was found that the electron-withdrawing (-NO₂, -Cl, -Br) substituents tend to higher melting points than the electron-donating (-Me, -OMe) substituents.



Keywords: Ionic liquids, TAAILs, Pyrazolium cations, Methanesulfonate, Substituent effects

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A Development of New Generation Biosensors with 2D Materials Beyond Graphene

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ABSTRACT

The use of glucose biosensors, which can measure by continuous measurement technology, has become an intensive research topic in diabetes patients' follow-up and treatment applications. Unfortunately, an electrochemical glucose biosensor or measurement system capable of continuous measurement with the requisite precision and sensitivity is not currently available on the market. Therefore, the development of fast, simple and inexpensive techniques in this area has great importance. This work aim to develop a new generation glucose sensitive electrochemical biosensor using two-dimensional extra-trans-element metarials (MoS₂, MoSe₂, WS₂, WSe₂) for the first time, which can be used for versatile, marketable, clinical, pharmacological and environmental samples.

Keywords: Dichalcogenide structures, graphene, Glucose biosensor, glucose oxidase

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**Investigation of Thermoelectric Properties of
Poly(ethylene dioxythiophene)-Poly (styrene sulfonic acid)/Copper Sulfide Nanocomposites**

Naseer Subhi AHMED¹, Ferdane Karaman¹

ABSTRACT

Thermoelectric materials can create a potential difference between two ends if there is a temperature difference between them. The present thermoelectric materials are made from the scarce elements in the earth such as bismuth, telluride or toxic metals like lead [Hanus et. al, 2017]. At the same they are high cost and rigid. Because of disadvantages of the these commercial thermoelectric materials, it was attempted to make polymeric thermoelectric materials with high performance [Shi et. al, 2017]. The most promising polymer is poly(ethylene dioxythiophene) (PEDOT) and its nano composites [Kim et. al, 2017].

In this study, at first copper sulfide nanoparticles was synthesized by a simple solution method and characterized by XRD, XPS and SEM. Then, PEDOT synthesized in the aqueous solution with poly (styrene sulfonic acid). The composites of the polymer and copper sulfide nanoparticles were prepared at various compositions by mixing them at ambient conditions. The electrical conductivity and Seebeck coefficients of these nanocomposites were measured on films coated on a glass substrate.

Keywords: Thermoelectric, PEDOT, copper sulfide, composite, nanoparticle

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Some Applications of Deep Eutectic Solvents for the Microextraction of Trace Inorganic and Organic species

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ABSTRACT

Within the framework of green chemistry, solvents occupy a strategic place. Green solvents are used widely in chemistry to minimize the environmental problems associated with the use of traditional solvents in chemical production as well as to reduce the cost and improve safety and health. The following four directions towards green solvents have been developed.

Quercetin and Patent Blue V in an aqueous medium were preconcentrated out by a deep eutectic solvent based ultrasound-assisted liquid phase microextraction (DES-UALPME) method and concentration of quercetin and Patent Blue V in extraction phase were determined in 370 nm and 627.5 nm by UV-VIS spectrometry.

Copper was preconcentrated with a deep eutectic solvent based liquid phase microextraction method and concentration of Copper was determined with FAAS. The developed methods were used for enrichment and quantification of very low concentration of analytes in different samples.

Keywords: Green solvent, DES, Quercetin, Patent Blue V, Microextraction



Extraction of Humic Substances from Leonardite with Polymer Inclusion Membranes

Aynur Manzak*¹, Yasemin Yıldız², Abdil Özdemir³, Ahmet Tutar⁴

ABSTRACT

Leonardite is a very important source of humic substances. The disuse of chemical fertilizers and growing interest in organic farming enhances the importance of leonardite and derivatives like humic acid, fulvic acid in agricultural activities. Leonardite was used in many areas such as, cosmetics, pharmaceutical industry, drilling sectors, filter systems and animal feed industry. The quality of the humic substances obtained from the extraction of the Leonardite varies depending on Leonardite source and extraction method.

Humic and fulvic acid was extracted from Leonardite by using polymer inclusion membrane. The advantage of the new method is that it is a one-step separation and a clean process. PIMs were prepared by using cellulose triacetate as polymer, a cationic carrier, tricaprilmethylammonium chloride (Aliquat-336), modifier tributyl phosphate and plasticizer 2-nitrophenyl pentyl ether. Extracted humic substances were characterized by UV-VIS and FTIR spectroscopic methods.

Keywords: Leonardite, Humic acid, Fulvic acid , Aliquat 336

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Phytotherapy and Medical Importance: Past to Present

Mahfuz ELMASTAŞ*¹

ABSTRACT

Phytotherapy is an increasing area in application for populations all over the world, including Turkey. For the first time in 1978, the Alma-Ata Declaration recognized the role of traditional and complementary medical application in the health system. Today, Traditional and Complementary Medicine has been recognized in developed and developing countries and has been used in many indications, and has been approved and integrated in the system by many healthcare systems in many countries. The social awareness and recognition of phytotherapy has increased and has become one of the important topics of medical research all over the world. Today, it is understood that the medical plants passed through the scientific research screen are much more useful to human beings and are very important in the treatment of diseases. The Green Wave or Green Drug, known as the return flow to the healing process, affects all of Europe and America. Phytotherapy plays a complementary role in many countries in the national health system. However, the issues such as safety, reliability, therapeutic approach, training need and ethical approach are important. There is a great need for well-planned research to better understand the benefits and harms of phytotherapeutic practices. As in the rest of the world, traditional medical doctors and healthcare professionals in our country who have only education at the undergraduate level and who are unable to put the idea of continuous and lifelong education into practice can not adequately respond to the development process in health and related scientific fields and the related needs. Because of this situation, graduate education is inevitable in special areas. Providing specialization in special fields will contribute to the further development of the ability to identify problems, to deal with events scientifically, to interpret and to find solutions.

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Design of Dielectric Lens Loaded Horn Antenna for Radar Applications

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ABSTRACT

In this paper, an effective approach to improve gain and directivity of a horn antenna is presented in Ka-band frequencies. A double-ridged horn antenna is designed and its performance result is analyzed in CST microwave studio programme. After that several shapes of dielectric lenses such as square paper, pyramid-shaped and triangle lenses are designed and placed into the aperture of the horn antenna. The horn antenna with these lenses is reanalyzed. Optimization of low side lobe level and insertion loss are examined and directivity results are at least 2.8 dB increased.

Keywords: Horn antenna, Dielectric loaded antenna, Ka-band.

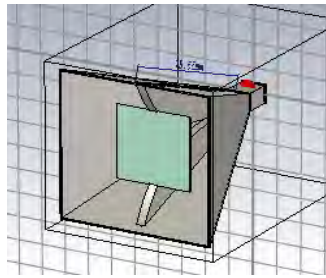


Figure: Horn Antenna with square paper lens

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Thermally Desorption of Methanol from the Surface of the Aluminosilicate SIRAL Used as Carrier of the Catalyst for the Hydrogenation of CO₂ into Methanol Based on the Data of Thermal Analysis, Chromatography and IR Spectroscopy Methods

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ABSTRACT

The catalytic hydrogenation of carbon dioxide to methanol is currently of considerable interest from the point of view of its utilization in valuable chemical products [1,2]. Hydrogenation of carbon dioxide to methanol is thermodynamically favorable ($\Delta H_{298K} = -49.5$ kJ/mol). Despite significant progress in this area, the search for effective catalysts to this day remains the main problem of catalytic chemistry. In the present work, the results of the study of thermal desorption of methanol from the surface of SIRAL-1.10.40 carriers based on the data of thermal analysis (thermal analyzer "STA-449 F3", NETZSCH in a stream of nitrogen gas at a temperature rise rate of 10 ° C / min), chromatography (Autosystem XL, Perkin-Elmer, USA). The infrared spectra of the initial and after interaction at different sample temperatures were recorded using an IR spectrometer FT-IR, Alfa, Bruker. Three temperature intervals for the desorption of methanol from the carrier surface were established: <300, 300-500 and > 500 ° C. IR spectra characterized catalyst samples heated at the indicated temperature intervals for 20 min. current of nitrogen. At the same time, products of the reaction of thermal desorption of methanol from the surface of the tiles were identified on-line chromatography. The influence of the carrier composition on the nature of the interaction of methanol with the carrier surface is discussed.

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Comparison of the catalytic activity of amine group substituted cobalt and manganese phthalocyanine complexes as hydrogen peroxide catalysts on oxidative bleaching

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ABSTRACT

Phthalocyanines (Pcs) and metallophthalocyanines (MPcs) have drawn considerable attention as molecular materials. The increasing interest in phthalocyanines arise from their thermal and chemical stability. Moreover, the architectural flexibility that allows the chemical and physical properties of these molecules to be regulated is an extraordinary feature for material science [1]. MPC's have important uses not only as commercial pigments but also as important functional materials in many fields [2].

In recent years, there has been a continuous interest in the search for new functional molecular materials for catalytic applications. The exceptional catalytic properties of phthalocyanines, such as oxidation of olefins, alkanes, alcohols and aromatic compounds have received considerable attention [3]. Especially, cobalt and manganese phthalocyanines have been employed in oxidation reactions because of their high catalytic activities [4].

In present work, we described the design, synthesis and characterization of four new phthalocyanine derivatives as the new bleach catalyst. We aimed to develop laundry bleaching at lower temperatures by means of decreasing activation energies with this kind of catalyst. We measured the oxidative bleach performance of this synthesized catalysts at room temperature in presence of H₂O₂ by online spectrophotometric method.

Keywords: Phthalocyanine, catalysis, bleaching.

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The Protective Effects of Fulvic Acid on the Skin Under the Chronic Water Avoidance Stress Conditions

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ABSTRACT

Introduction&Objectives: Stress is a common condition which is affecting all living organisms. Chronic life stress induce or worsen many inflammatory skin diseases such as atopic dermatitis, psoriasis and urticaria. It may be related to infiltration and activation of mast cells because mast cells cause inflammatory and allergic reactions by release inflammatory mediators upon stress activation. Water avoidance stress (WAS) is an animal psychological stress model which acts like life stress of human when its duration is five days minimally.

Fulvic acid is a water-soluble humic material. It can enter the cell by passing through all the morphological barriers with its relatively low molecular weight. It is non-toxic naturel agent and has antiinflammatory property.

The aim of this study is to investigate unfavourable effects of water avoidance stress (WAS) on the rat skin and if so, fulvic acid can protect the skin from chronic psychological stress by inhibit mast cell activation via its antiinflammatory property.

Materials&Methods: Spraque-Dawley male rats were divided into three groups as follows: Control (C), Water Avoidance Stress (WAS) and Water Avoidance Stress+Fulvic Acid (WAS+FA). Histological sections obtained from skins of animals were histochemically stained with Masson's trichrome and toluidine blue methods.

Results: Epithelial damage, dermal inflammation and increase in mast cell number and activation were found in the WAS group compare to the control group C. In WAS+FA group ameliorated epithelial damage, reduced dermal inflammation and reduced numbers and activities of mast cells were shown when compared with the WAS group.

Conclusion: The results of the study demonstrated that the fulvic acid established the protective effect on the skin via its antiinflammatory property under the chronic psychological stress conditions.

At the future fulvic acid may be used as a therapeutic agent for healing stress induced disorders if it is tested at various doses.

Keywords: Fulvic Acid, Water Avoidance Stress, Inflammation, Skin, Mast Cell

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DETERMINATION OF PROTONATION CONSTANTS OF TRIAZOLE DERIVATIVES BY COMPUTATIONAL METHODS

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ABSTRACT

Triazole derivatives have various biological properties including antimicrobial, antifungal, antiviral, antituberculosis, anticancer, antioxidant, anticholinesterase, anti-inflammatory, antidepressant, anti-anxiety and anticonvulsant activities. The well-known CNS active drugs loreclezol, rizatriptan are triazole derivatives [1]. 1,2,4-Triazole, a five membered heteroalkane having two carbons and three nitrogen atoms and the molecular formula $C_2H_3N_3$. This compound is a basic aromatic heterocycle having two different tautomeric forms. The 1,2,4-triazole core structure represents an important pharmacophore commonly used in medical chemistry. 1,2,4-triazole-based compound derivatives have been developed as fungicide, anti-inflammatory and anti-cancer agents [2]. The knowledge of the acidity constants of compounds has a very high prevalence in the understanding of many biochemical and chemical reaction mechanisms. The pK_a determination is mostly done experimentally. However, the fact that the right pK_a determinations that can be made with theoretical chemistry methods can be done before the synthesis of the molecules gives very important advantages in terms of reaction mechanisms. Our aim in this study is to theoretically calculate the PCA's by computational chemistry methods of 7 different 1,2,4-triazole derivative compounds (Figure 1) synthesized by Calapoğlu [3] and colleagues and empirically calculating PCA's.

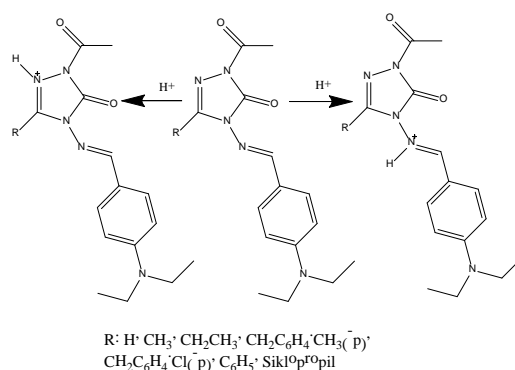


Figure 1

Keywords: Triazole, pK_a determination, M062X

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RELATIONSHIP BETWEEN BASIC INDEX PROPERTIES OF STONE AND CAPILLARITY VALUES

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ABSTRACT

Through the instrument of magmatic, metamorphic and sedimentary rocks have been used as main structural elements (to carrying loads such as walls, columns and beams) or they have been used as a floor and wall tiles by being processed directly or formed in many buildings from the past to the present day. Although the stones are not used as structural elements in today, they are used as a cladding, tiles and paving for aesthetic purpose in modern constructions. These building stones can lose some of their quality due to some atmospheric effects in over time. The most effective element in this process is atmospheric water (rain, snow, etc.) that penetrates to the rock as capillary of groundwater.

Although it is possible to remove atmospheric water from the historical buildings, it is not possible to completely remove groundwater from the structure.

The capillarity is that the ground water rises along the capillary cavities in the rock with the opposite direction to gravitational acceleration. In some cases, the rising water and dissolved salt minerals are transported into the rock. Therefore, by the evaporation of water, the salt is recrystallized in the pores and the pore pressure is increased. While in other case water rising due to capillarity depending on the atmospheric conditions causes freeze in the pores and pressure is increased again. Because of both repeated processes, undesirable breakdowns occur in the rocks. The most effective element in this process is the capillarity, which is very difficult to understand because the capillarity mechanism in the rocks depends on many factors such as pore diameter, clay content and whether the pores are connected to each other.

In this study, capillarity values of rocks were estimated more simply and understandably by using the basic index properties of rocks. For this purpose, 80 rock samples have been used as structural elements in historical constructions and capillarity values have been estimated by simple regression analysis using basic index properties of rocks. It has been observed that the rocks have a very high correlation coefficient with capillarity values and many basic index properties. Beside that similar rock clusters are clustered in a certain region has been observed too.

Keywords: Capillarity, building stone, index properties, simple regression analysis

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APPLICATION OF SOLAR ABSORPTION REFRIGERATION SYSTEMS IN NORTHERN NIGERIAN

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ABSTRACT

The objective of this work is to design a 10kW solar vapour absorption refrigeration system to be used in northern Nigeria. It will be driven by hot water which will be generated by the help of evacuated tube solar collectors connected to the absorption refrigeration system. COP of the system was found based on selected generator and cooling water temperatures. A General review on energy was made. The need for using renewables around the world was also emphasized. Solar energy, solar system technologies and some other cooling techniques were also discussed.

The two refrigeration systems, namely, vapour compression refrigeration systems and vapour absorption refrigeration systems (VCRS and VARS) were discussed with different refrigerant/absorbent combinations. Absorption refrigeration system with Lithium bromide-water cycle was used in this work. The basic difference between the two systems were also mentioned. Solar absorption cooling was discussed. Some refrigerants like R717, R718, and R419a were highlighted. The design of LiBr-water absorption refrigeration system was made and a good COP was achieved. Mass flow rates were calculated and the heat input requirement was found to be 15.35kW. The COP of the system is calculated to be 0.65. Cooling degree days found to be 501 and energy saved per year is found to be 1909kWh of electricity. The CO₂ emission reduction as a result of energy savings is also calculated to be 687.24kg/year.

Conclusion From this design of a solar 10 kW Refrigeration Systems for rural application, positive results were found. Operation of absorption refrigeration systems using low-grade heat proved to be very economical, cost competitive and can be possible to run in both rural and urban areas as it requires little or no electricity at all. Different refrigerant-absorbent combinations were studied but LiBr-water combination was selected as the best choice as it is environmentally friendly, it does not emit any harmful gases to the atmosphere and does not contribute to global warming. Flat plate solar collectors were selected as the most suitable technology for this work because the heat input required to run the generator not very high. The temperature needed can be attained using the selected technology. The system has achieved a very good COP (0.65) with generator temperature of 75°C. Also, a good amount of energy has been saved and CO₂ emission has been reduced. Higher temperature can be converted into work, but such is not possible with low grade heat. Since the electrical energy use of the system is low, it might be possible to have a small PV system with batteries connected to the whole system so that the system can run independently. A hybrid system can also be introduced to the absorption refrigeration system to produce both heat and electricity simultaneously to run the heat pump independently.

Keywords: Absorption, Refrigeration, Refrigerant, Lithium bromide.

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Hospital Location Selection using TOPSIS and Fuzzy AHP

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ABSTRACT

Choosing a hospital location is a long-term strategic decision to ensure that the hospital can provide good service and maintain its continuity. Many criteria must be taken into account when choosing a hospital location. In this study, two of the multi-criteria decision making methods in which are fuzzy AHP and TOPSIS are used for hospital location selection. The linguistic expressions of experts have been transformed into fuzzy numbers to achieve more realistic results. Two methods have been applied for choosing the most suitable location among the 5 alternatives for the hospital location selection. Although orders of the alternatives has been found different, the most suitable location has been found same in both. Fuzzy AHP and TOPSIS methods provided close results in choosing hospital location. It has been shown that decision-making methods can support decision-makers considerably, especially when long-term strategic decisions are at hand.

Keywords: Fuzzy Logic, Fuzzy AHP, TOPSIS, Hospital Location Selection

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DETERMINATION OF SOME HEAVY METAL (Lead, Nickel, Cadmium and Zinc) POLLUTION OF ROADSIDE SOIL AT THE ŞANLIURFA-VİRANŞEHİR HIGHWAY

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ABSTRACT

The aim of this research is to determine the levels of lead (Pb), nickel (Ni), cadmium (Cd) and zinc (Zn) pollution that can be generated from traffic intensity in the roadside soil of between Şanlıurfa province and Viranşehir district highway roads. For this purpose, a total of 54 soil samples were taken from the 0-20, 20-40 and 40-60 cm depth at a distance of 5, 15, 30 m. The 3 different points of 50's m right and left sides of the highway. The soil samples were prepared to analysis with using acid digestion method. The obtained elements were identified by ICP. The average Pb, Ni, Cd and Zn contents of the soils were 78.67, 69.44, 0.577 and 25.07, respectively, and it has been identified that the results were changed between Pb 48.11-101.7, Ni 44.91-85.11, Cd 0.588-1.181, and Zn 14.61-48.97 mg kg⁻¹. It. According to the limit values of soil pollution parameters; Pb, Cd and Zn values were found to be below the limit values (300 mg / kg, 3 mg / kg and 300 mg kg⁻¹, respectively) but Ni values were found to be slightly above the limit value (75 mg kg⁻¹). Pb, Ni, Cd, and Zn concentrations varied with depth and direction distance interaction. Although it was not found to be significant as statistically, it has been observed that the concentration of heavy metals decreases as away from the highway. These results showed that the accumulation of heavy metal in the soil of the roadside is traffic intensity originated. These heavy metals are followed in the order of Pb > Ni > Zn > Cd in the soil in terms of quantity.

Keywords: Soil Pollution, Heavy Metal; Traffic Pollution, Şanlıurfa, Roadside

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Uğur BİLGE ve Kerim Mesut ÇİMRİN " Viranşehir-Kızıltepe Karayolu Kenarındaki Topraklarda Motorlu Taşıtlardan Kaynaklanan Ağır Metal Kirliliği." *Journal of Agricultural Sciences*, 19 (2013) 323-329.

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ELECTROCHEMICAL PROPERTIES AND VOLTAMMETRIC DETERMINATION OF CERTAIN ANTIDIABETIC AGENTS IN BULK AND PHARMACEUTICAL FORMULATION

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ABSTRACT

Empagliflozin (EMP) is indicated as an adjunct to diet and exercise to improve glycemic control in adult patients with type 2 diabetes [1]. EMP,(2S,3R,4R,5S,6R)-2-[4-chloro-3-[[4-[(3S)-oxolan-3-yl]oxyphenyl]methyl] phenyl]-6- (hydroxymethyl)oxane-3,4,5-triol (Figure 1), is an antidiabetic agent.

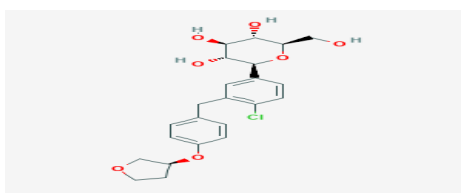


Figure 1. Chemical structure of EMP

The adsorptive and oxidative behavior of Empagliflozin (EMP) at a glassy carbon electrode was studied using cyclic and differential pulse voltammetry [2]. A simple, selective and precise differential pulse adsorptive stripping voltammetry was presented. The adsorptive stripping responses were evaluated with respect to pH, accumulation potential and accumulation time. The optimal experimental parameters for the EMP; accumulation time: 80 s, frequency: 120 Hz, pulse amplitude: 40 mV, accumulation potential: -1.0 V, and accumulation time: 5 s. The EMP in Britton Robinson buffer pH 3.0 was oxidized at +1300 mV, giving rise to well defined peak. The response was linear over the concentration range of 1.0×10^{-4} – 4.0×10^{-5} M, allowing a rapid, accurate and precise determination of the concentration of EMP. Under optimal conditions, limit of quantitation and limit of detection for EMP were calculated. The proposed method was applied successfully without any interference from excipients, to the determination of EMP in bulk form and in pharmaceutical preparation.

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A Research on Past, Present and Future of Pomegranate Cultivation in Turkey

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ABSTRACT

Pomegranate plant that its gene center is between South Caucasus, Iran, Afghanistan, South Asia, West Asia, Anatolia and the Mediterranean regions is one of the oldest cultivated agricultural products. This species that a engravings which in places of worship mentioned in the sacred boks and that have taken place in depicting and tables is a very special fruit that gives its name to a variety of settlements. Pomegranate cultivars has find the most common habitat, in regions where Mediterranean rainfall regime to be effective, fields up to 1000 meters altitude from the coast. In this context, in Turkey, the Mediterranean, Aegean and Southeast Anatolia are the regions producing the most amount of pomegranate, respectively. In terms of provinces, Antalya, Mugla, Mersin, Adana, Denizli, Hatay and Gaziantep are foremost in pomegranate farming. Until 2002 in Turkey approximately 60 thousand tons production were made using around 3 million pomegranate trees. In the period after 2002, it was established a new pomegranate orchards due to government support and favorable market conditions. As a result of this, the number of the pomegranate trees has exceeded 17 million and also the production reached 465 thousand tons by the end of 2016. In addition, many pomegranate cultivars such as Hicaznar, Silifke aşısı, Zivzik, Fellahyemez 1 and İzmir 1 or hundreds of pomegranate types such as 56PER021, 56PER022, 56ŞİR21, 56PER003 and 56PER019 in Turkey are grown. Pomegranate cultivars should be cultivated according to modern conditions and ecological conditions. Depending on the pomegranate variety and its characteristics, these are a fruit that can be consumed as fresh, as well as pomegranate juice and pomegranate molasses are the most common application areas of it. In Turkey, many studies on pomegranate cultivation have been carried out from past times to day. In this context, scientific studies on pomegranate should be continued. As a result, through presenting the existing status of the pomegranate cultivation and production, problems and solution proposals of Turkey, it was aimed to increase the awareness and set light to decision makers for making use of and directing the existing potential in future plans.

Keywords: Pomegranate, cultivation, cultivar, production, problems and solutions, Türkiye.

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Determination of *Diplostomum sp.* in *Capoeta umbla* from Elazığ District

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ABSTRACT

Fish are always confronted with parasitic infestation as the nutrients in the water from the upper part of the pyramid. These parasites are harmless if they are a few numbers in fish, but a significant problem if found in high numbers. When the natural ecosystems are out of balance due to pollution, the harmful effects of the parasites on the fish are increasing. In this case, it is very important to detect parasites in fishes. In our study, we aimed to determine the parasites in *Capoeta umbla* which collected from Karakaya, Keban and Hazar lakes in Elazığ district. In the hunting, nets with a width of 70, 42 and 15 mm were used. In a total 150 specimens were obtained with *Diplostomum sp.* which is a dominant parasite group in fish. The determination of *Diplostomum sp.* were made according to the protocol of Bykhovskaya-Pavlouskaya (1964), Hoffman (1967), Kennedy (1974), Ekingen (1983). The voucher parasites were deposited in ethanol 96%. *Diplostomum sp.* were found in the eyes of fish and blind the eyes and prevent the fish from hunting and this can result in the death of the fish. Minitab analyses were made by the parameters of age, size, weight and sexes of *Capoeta umbla*. As a result of the analysis, it is showed that the *Diplostomum sp.* were increased due to the increase in age, size and weight.

Keywords: *Capoeta umbla*, *Diplostomum*, parasite, Fish, Elazığ

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Green Polymeric Materials From Liquefied Biomass-Based Polyols

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ABSTRACT

This study reviews a number of studies about polyesters, polyurethane foams, adhesives, and epoxies, which were produced via biomass-based bio-polyols from polyhydric alcohol based liquefaction in combination with some industrial chemicals. In the liquefaction technique, the biomass degraded in an organic solvent (e.g., glycerol, ethylene glycol, polyethylene glycol) in the presence of an acid or alkaline catalysts at moderate temperatures elevated temperatures without a catalyst under atmospheric pressure. The plenty hydroxyl groups of biomass make it possible to convert the lignocellulosic polymers into intermediate bio-polyols. For example, degradation of cellulose during liquefaction with ethylene glycol progresses with the formation of a huge quantity of hydroxyethyl glucosides, in the early stage of reactions. These glucosides subsequently decomposed into the 2-hydroxyethyl levulinate. However, lignin degrades into smaller fractions, which are exposed to the recondensation in the presence of an acid catalyst. A condensation reaction takes place between the carbonium cations at the α -position and electron-rich aromatic-ring carbons of the lignin derivatives, generating the diphenyl-methane structures. Polyurethane foams can be prepared from the bio-polyols reacted with isocyanates in three different structures comprised the rigid type using polymeric methylene diphenyl diisocyanate (PMDI), semi-rigid type using polyaryl polymethylene isocyanate (PAPI), and flexible type using toluene diisocyanate (TDI). The phenolic bio-polyols can easily react with an aldehyde to form novolac type resin under acidic conditions or resol type resin under basic conditions. The liquefied biomass can also react with bisphenol A and epichlorohydrin to prepare epoxy resins or adipic acid and phthalic acid anhydride as reagents and dibutyl tin oxide as the catalyst to prepare polyesters.

Keywords: Green polymers, Liquefaction, Biomass, Polyhydric alcohols, Bio-polyols

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Infrared-Microwave Combination Baking of Gluten-Free Cakes: An Optimization Study

Özge Şakıyan Demirkol

ABSTRACT

Combination of microwaves with near infrared heating is a promising development in microwave baking. The infrared-microwave combination oven combines the browning and crisping advantages of near infrared heating with the time saving advantages of microwave heating. In this study it was aimed to optimize the formulation of a functional cake (soy-cake) to be baked in infrared-microwave combination oven, and to optimize the processing conditions of the combination baking. Response surface methodology was used for optimization. Three levels of baking time (8, 9, 10 min), the soy flour concentration (30, 40, 50%) and the DATEM (diacetyltartaric acid esters of monoglycerides) concentration (0.4, 0.6 and 0.8 %) were used as independent variables of the study. As the dependent variables, specific volume, weight loss, total color change and firmness of the cake samples were chosen. The optimization was performed for minimum weight loss, maximum total color change and minimum firmness values. The results showed that the responses of the optimum points were almost comparable with those of conventionally baked soy-cakes which is a good sign for considering infrared-microwave combination baking a promising technique to produce high quality soy cakes in a very short time.

Keywords: Microwave-infrared combination, Baking, Optimization, Response Surface Methodology, Cake



Investigation of Lead Adsorptive Capacity of Modified Olive Core Shells from Aqueous Media

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ABSTRACT

Husk of olive seed is rich in cellulose and lignin [1,2] Enough olive husk for investigation was crushed between 650 – 800 µm size in order to determine removal effect of this cellulosic structure from the aqueous medium. This cellulosic structure was purified unwanted contents by process at 100°C water and later extraction with carbon tetrachloride[3,4,5]. Then, the sample was dried oven temperature of 110 °C and was used as an adsorbent for experiments. A total of sixteen experiments were performed by changing parameters which pH. Temperature, lead concentration and adsorbent amount. Lead analysis of experimental examples was performed using the standard dithizone method. The best adsorption was obtained at pH 6 and 7. At pH values which lower than 6 and higher than 7, the adsorption was decreased. Other experiment cycles were performed at temperature of 20°C, 30 °C, 50 °C and 60 °C. The highest adsorption was obtained at temperature of 60 °C. This result means that some chemical adsorption might be occurred besides physical adsorption as well as. Among the tests that concentration affected, the best adsorption yield was obtained for the experiment with the highest initial concentration. At equilibrium state 1 g adsorbent removed % 60 of lead from 50 ppm – 200 ml lead solution. Adsorption yield was 6 mg Pb/g adsorbent. Experiments according to the adsorbent dose, the peak adsorption was at the solution has the most adsorbent concentration and the low adsorption was at the solution has the least adsorbent concentration. At optimal conditions, using 2g of adsorbent, 95% of lead was removed from 2 ppm lead 200 ml of solution. On the other hand, under proper circumstances, the adsorption yield was 0,2375 mg Pb / g adsorbent.

Keywords: Core shells, Adsorption, Sorbent, cellulose, Adsorption isotherm

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Determination of the total polyphenol content of the yellow pine bark

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ABSTRACT

Polyphenols, bioactive organic compounds which have a member of more than 8,000[1,2]. polyphenols are used in the treatment of many diseases due to their antioxidant properties and pharmaceutical industry[1]. Flavonoids is represent half of polyphenols and anti flavonoids is the other half. Flavonoids, have a common framework structure formed by linking two aromatic benzene ring by a chain of three carbons. Polyphenols are a good π electron donor behave as Lewis acid [3,4]. Total polyphenol determination methods have been developed by utilizing the reducing property of polyphenols. In this study we chose the pine bark as a source of Polyphenols[5,6]. We refine crude sample before the purifying 450 mm particle size from coarse dirt. In the extraction process, we used recently developed and applied microwave and ultrasonic extraction methods separately. As the solvent, water, methanol and ethanol substances were used. We did a total of six experiment on the basis of these five variables. In the separation of extract Folin-Ciocalteu Reagent (FCR) method was used. The total polyphenol content of samples was appointed by using UV-vis device. The amount of total polyphenols were expressed as Gallic acid equivalent. In this point we demonstrated that the ultrasonic extraction method was more successful than the microwave method to be. On the other hand it was understood that the ethanol generally gave better results compared to other solvents. Under optimal conditions, in the presence of 1 g of pine bark 1,098 mg polyphenols were determined.

Keywords: Pinus sylvestris; Antioxidant; Flavonoids; Extraction; Optimization

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On a New Investigation of Some Sets via Mappings

Özlem Elmalı¹, Erdal Ekici^{*2}

ABSTRACT

Applications of the sets in the most of the branches of mathematics were studied and considered for many investigations. In 2011 and 2012, Ekici studied and considered some sets for generalized hyperconnected spaces and generalized submaximal spaces [E. Ekici, Generalized hyperconnectedness, *Acta Mathematica Hungarica*, 133 (1-2) (2011), 140-147; E. Ekici, Generalized submaximal spaces, *Acta Mathematica Hungarica*, 134 (1-2) (2012), 132-138]. The goal of this paper is to present a new investigation of some sets via mappings.

Keywords: Investigation of set, Mapping, Application of sets, Generalized topology

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On The Concepts Used in The Characterizations of Some Topological Spaces

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ABSTRACT

One of main studies of the topology is to characterize topological subjects which are connected spaces, compact spaces, Lindelöf spaces, etc. Characterizations of some topological spaces and topological subjects have been studied by many Authors: Dontchev, Ekici, Singal and Mathur, etc. The aim of this paper is to study new applications of some concepts used in the characterizations of some topological spaces.

Keywords: Special space, Characterization, Condition, Topological space

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The Synthesis of New Group of Tetracyclic Diazaquinones and Naphthoquinone Compound

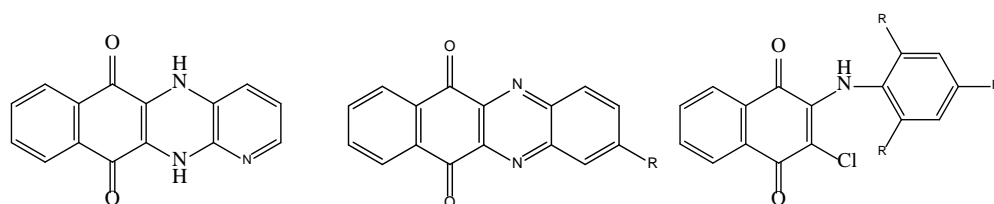
Cigdem Sayil*¹, Nahide Gulsah Deniz¹, Semih Kurban¹

ABSTRACT

Polycyclic azaquinones possess various biological activities and are promising for practical use in other directions. For example, tricyclic diazaquinones exhibit high anticancer activity, tetracyclic benzo[*b*]phenazine-6,11-diones and products of their modification are under studies for potential use as dyes.

In recent years increasing recognition of biological activities of natural and synthetic 1,4-naphthoquinone derivatives has stimulated enormous interest in this class of compounds. The clinical importance of this class of compounds has led to the development of new agents in which retaining the core 1,4-naphthoquinone moiety could exhibit variety of biological effects including cytotoxic, antiviral, molluscidal, anti-inflammatory, antiplatelet, antiallergic, antimalarial, antileishmanial, antibacterial, antifungal and antiproliferative activities. (Deniz, N. G. et al., 2015, Zvarych, V. et al., 2016) Structure–activity relationship studies from quinonoid compounds indicated that the number and position of nitrogen (N) atoms substituted in the heterocyclic ring were considerably important factors to affect the biological activities. The presence of amino, thio- or chloro-moiety on the quinones was considerably important factor to effect antifungal activity.

In conclusion, we synthesized a new group of tetracyclic diazaquinones as potentially biologically active compounds. All new compounds were characterized on the basis of nuclear magnetic resonance spectroscopy (¹H- and ¹³C-NMR), mass spectrometry (MS), and fourier transform infrared spectroscopy (FT-IR).



Keywords: Synthesis, Quinoxaline, Phenazine, Naphthoquinone

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Thermal profile of the borage (*Trachystemon orientalis* L.) plant polyphenol oxidase

Esma Hande Alici¹, Gulnur Arabaci^{*2},

ABSTRACT

The purpose of this work is determining the thermal profile of polyphenol oxidase (PPO) enzyme of borage plant. Within this scope, a crude enzyme extract that contains polyphenol oxidase was obtained from borage plant. The sample was homogenized in phosphate buffer containing 1 mM ascorbic acid, 0.5% (w/v) polyvinylpyrrolidone and 2% (v/v) Triton X-100 at 4 °C. The homogenate was filtered and centrifuged at 5000g for 15 min. The enzyme activity was measured at different temperatures from 5 to 70 °C to determine the optimum temperature of borage PPO using catechol, 4-methylcatechol, pyrogallol and caffeic acid as substrate. The thermal stability of the enzyme was studied by heating the enzyme solution at various temperatures in the range of 30–80 °C using 4-methylcatechol as substrate. A constant volume of incubated enzyme solution was cooled in an ice bath at periodic intervals and residual enzyme activity was measured under standard assay conditions. The results showed that the optimum temperature for borage PPO activity was at 5 °C with 4-methylcatechol, 10 °C with catechol, 20 °C with caffeic acid and 30 °C with pyrogallol as substrate. Borage PPO enzyme was stable at 20–50 °C and also 40% of its activity remained after incubation at 60 °C for 60 min. It was completely inactivated when heating at 70 °C and 80 °C for 60 and 12 min, respectively. In conclusion, we found that borage PPO enzyme is a thermally stable enzyme particularly up to 70 °C.

Keywords: Borage, Optimum temperature, Thermal inactivation, *Trachystemon orientalis* L.

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Investigation Fractions of Some Heavy Metals In The Sapanca Lake Sediment Samples By Using Microwave Assisted Sequential Extraction Procedure

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ABSTRACT

Sapanca Lake is one of the most important sources of drinking water in Turkey and Marmara region. Chemical speciation is important for the assessment of mobility and toxicity of heavy metals (Tokalioglu, S, 2005). Total metal content measurements are basically a poor indicator of bioavailability, mobility or toxicity of the metal, depending on the chemical composition of the different components of the sample (Arain, M.B., 2008). Microwave assisted sequential extraction method, optimization works were performed and the method was developed to give the best result with BCR 701 standard reference material. In this study, a microwave assisted extraction procedure was used for investigation fractions of some heavy metals in the Sapanca lake sediment samples. Sediment samples were collected from ten different stations in Sapanca Lake. The sediment samples are analyzed using inductively coupled plasma mass spectrometry. Chemical fractions of the heavy metals (Cr, Cu, Fe, Pb, Mn, Ni, and Zn) were determined by using microwave assisted BCR sequential extraction procedure in the in the sediment of Sapanca Lake. The obtained results will be presented in 1st International Conference on Innovations in Natural Science and Engineering (ICINSE 2018).

Keywords: Sapanca Lake, Sediment, Sequential extraction, ICP-MS.

Acknowledgement

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Development of calcium-selective potentiometric sensor using 4-Bromo-4-Bromo-kalsimisin compound as ionophore

Ömer İŞILDAK

ABSTRACT

Calcium is an important component of a healthy diet and a mineral necessary for life. Calcium is a mineral that people need to build and maintain strong bones and teeth. It is also very important for other physical functions, such as muscle control and blood circulation. If we do not have enough calcium in our diets to keep our bodies functioning, calcium is removed from where it is stored in our bones. Over time, this causes our bones to grow weaker and may lead to osteoporosis (a disorder in which bones become very fragile). Calcium needs vary with age. The need recommended dietary allowance for calcium by Food and Nutrition Board is approximately 1300 mg per day for adolescents and 1100 mg per day for adults (Petrovich et al., 2007; Mahan and Stump, 2002). Several techniques have been used to quantify calcium in foods and environment samples, mainly flame atomic absorption spectrometry (FAAS) (De la Fuente and Juárez, 1995), titrimetry (Baccan et al., 2001), inductively couple plasma optical emission spectrometry (ICP OES) (Murcia et al., 1999) and inductively couple plasma mass spectrometry (ICP-MS) (Nobrega et al., 1997). There is a high demand for chemical analysis of foods and environment samples with simplicity, low costs, generated residues and time, without loss of quality in results obtained.

This work deals with preparation of micro-size composite potentiometric calcium-selective sensor. For this aim, calcium-selective sensor membrane was prepared by coating composite cocktail on the surface of contact transducer in solid state (Isildak and Isildak, 2013; Isildak and Covington, 1998). Calcium-selective sensor was not constituted internal reference electrode or solution. The potentiometric performance of calcium-selective chemical sensor (selectivity constant, liner working interval, detection limit, response time, pH working interval, repeatability, lifetime, and time dependent potential decay) was determined using computer controlled measurement system in static conditions. Potential behavior and linearity exhibited against the concentration gradient of calcium (II) ion of all-solid-state PVC membrane potentiometric calcium-selective sensor.

Keywords: Potentiometric sensor, ionophore, selectivity to calcium.

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Semiz otu (*portulaca oleracea*) içindeki etken bileşiklerin kimyasal aktivitelerine teoriksel yaklaşım

Theoretical approach to the chemical activities of the active compounds in *portulaca oleracea*

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ABSTRACT

Portulaca oleracea L., a member of the Family *Portulacaceae*, as vegetable and also herbal medicine against several diseases have been used from many ethnic groups for many centuries (1). Kaempferol, apigenin, myricetin, quercetin and luteolin were determined on capillary electrophoresis with electrochemical detection (CE-ED) in plant species.(2) Antioxidant activities of three phenolic alkaloids;oleracein A (OA), oleracein B (OB) and oleracein E (OE), isolated from *Portulaca oleracea* were determined the scavenging activity against 1,1-diphenyl- 2-picryl-hydrazyl (DPPH) radical and inhibitory effect on hydrogen peroxide-induced lipid peroxidation in rat brain homogenates. The DPPH radical scavenging activities of these phenolic alkaloids were lower than caffeic acid but higher than ascorbic acid and α -tocopherol, being in the following order: OB > OA > OE. OE was most potent in preventing formation of malondialdehyde (MDA) close to that of caffeic acid [3]. In our study; the chemical activity of some effective substances in *Portulaca oleracea* L. for different phases were investigated by using Density functional theory (DFT) as theoretical.

Keywords: *Portulaca oleracea* B,A,E, L., oleracein, caffeic acid,DFT

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INVESTIGATION OF EFFECTS ON RIPENING OF DIFFERENT TYPES OF FRUITS USED IN KASHAR CHEESE PRODUCTION

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ABSTRACT

In this study, six types of Kashar cheese, one of them is control sample, were produced. While control cheese was produced without adding any fruits; the others were processed to cheese by adding blueberry, cranberry, black grape, black mulberry and pistachio as 3% according to the milk used. Then, all cheeses were vacuum-packed and ripened at $7\pm 1^\circ\text{C}$ during 3 months and dry matter, fat, pH, titratable acidity, salt, total protein, ripening rate, non-protein nitrogen rate (NPN), amino nitrogen rate, electrophoretic casein fractions, textural properties and sensory analyses were performed by taking cheese samples during the 3rd, 30th, 60th and 90th days of ripening.

The results were compared in terms of the types of cheese and ripening period, statistically. The values of adhesiveness, springiness and resilience parameters of texture profile analyses and also the values of structure-texture parameters of sensory analyses were not statistically significant ($P>0.05$). The values of fat and the values of springiness parameters of texture profile analyses were determined statistically significant ($P<0.05$). All of the other parameters were obtained statistically significant ($P<0.01$).

As a result of sensory evaluation made by panelists, ripened cheeses had more acceptability than fresh cheeses. Also as cheese type, samples with cranberry and black mulberry exceeded in common with control sample.

Keywords: Fruit, Kashar Cheese, Ripening.

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Synthesis of New Derivatives from Naphthoquinone Containing an Electron-withdrawing Group (EWG) in the Aromatic Ring

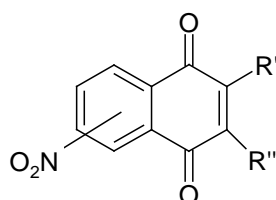
Cigdem Sayil*¹, Nahide Gulsah Deniz¹, Aesha F.SH. Abdassalam¹

ABSTRACT

2,3-Dichloro-1,4-naphthoquinone is a special naphthoquinone with four electrophilic sites, useful for applications in organic synthesis and preparation of a diverse new compounds, such as 2,3-substituted derivatives and heterocycles, including those with the core naphthoquinone structure fused. It has also been used for the preparation of compounds for evaluation against several biological targets.

Naphthoquinones are compounds found in higher plants which have been used in folk medicine for the treatment of various diseases. Naphthoquinones have been reported to possess a variety of pharmacological properties including antibacterial, antifungal, antiviral, anti-inflammatory, antiatherosclerotic and anticancer effects (Deniz, N.G. et.al., 2015). 1,4-Naphthoquinone encompasses the quinone pharmacophore which is typically associated with most of the biological activity of similar molecules. Recent studies have shown that the incorporation of a chlorine atom into 1,4-naphthoquinone derivatives is essential for antifungal activity. In addition, 1,4-naphthoquinones possessing an amino or a substituted amino group in the 2-position, have been used in a variety of medical and biological applications, including as antituberculars, antimalarials, antibacterials, antitumor agents, larvicides and molluscicides, herbicides, and fungicides.

All new compounds were characterized on the basis of nuclear magnetic resonance spectroscopy (¹H- and ¹³C-NMR), mass spectrometry (MS), and fourier transform infrared spectroscopy (FT-IR).



Keywords: Synthesis, EWG group, Amines, 5/6-Nitro-Naphthoquinone

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Computational study of opened-shell hydrogen bonding of HSO and HOO radicals with NH₂COOH stable molecule

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ABSTRACT

Computational methods are applied to investigate the opened-shell intermolecular hydrogen bonding between NH₂COOH (carbamic acid) and HOO and HSO radicals. All the complexes are computed at MP2 and B3LYP methods using 6-311++G(d,p) basis set. HOO and HSO radicals attached to three different sites of NH₂COOH for investigating intermolecular hydrogen bonding. From the geometrical minimization it is showed that all the complexes are consists of seven membered cyclic structures. The optimized geometrical parameters showed that O—H---O and O---H—O intermolecular hydrogen bonds are stronger than the N—H and S—H hydrogen bonds. The bond lengths and frequencies analysis shows that O—H and N—H bonds are elongated and its stretching frequencies decreases in complex formation which indicating red shifted hydrogen bond while S—H bond contracts and its stretching frequencies enhances in the complexes which confirmed blue shifting hydrogen bond. The site-1 (S-1) is more favorable for HOO and HSO as compared to site-2 (S-2) and site-3 (S-3). The counter poise corrected interaction energies show that C-1 and C-2 are stronger hydrogen bonded complexes. Electron density (ρ) and Laplacian of electron density ($\nabla^2\rho$) are calculated using AIM analysis, confirming that O—H---O and O---H—O bond are comparatively stronger. Natural bonding orbital analysis is employed to explain the mechanism of X—H frequency shifts through electron density redistribution, hyperconjugation, rehybridization and to determined the E-index which give the reason for red and blue shifting.

Keywords: Opened-shell, intermolecular hydrogen bonding, Red Shifting, Blue shifting, AIM analysis

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DFT and AIM computation of charge transfer complex between 2,6-diaminopyridine and picric acid

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ABSTRACT

A computational study is the leading approach to investigate charge transfer in donor-acceptor complexes. It is an important tool to predict the nature of donor or acceptor molecules. The charge transfer complex between 2,6-diaminopyridine (DAP) as electron donor molecules and picric acid (PA) as charge acceptor molecules is studied at density functional theory (DFT/B3LYP) and employed 6-311G(d,p) basis set. It is observed that on complexation, DAP bond length parameters are increased considerably. Lengthening of bond lengths suggest that charge density moves from DAP to PA. The NBO charge distributions are observed on different atoms between free species and the formed complex significantly, with very few exceptions. This effect shows that the charge is transferred from the donor to acceptor molecule and also from acceptor to donor molecules respectively by back donation method. The Atoms in Molecules (AIM) analysis also showed that there is stronger hydrogen bonding exists in the donor-acceptor molecules which proved the formation of charge transfer complex between the species. Likewise, TD-DFT, HOMO-LUMO analysis, ionization potential, electron affinity and thermodynamical data proved the charge transfer complexation between DAP and PA. The results are comparable with experimental results.

Keywords: Charge transfer complexes, DFT, HOMO-LUMO, NBO, AIM analysis

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A research on Production Potential of Fruitsgrown on Ağrı Province

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ABSTRACT

One of the most important factors limiting the fruit growing of Ağrı province of East Anatolia Region of Turkey are the ecological conditions. In this province, six fruit species are grown and These fruits's name are apple, pear, plum, apricot, cherry and sour cherry. According to 2016 statistics total fruit production was realized to be 159 tons in Ağrı. Considering the same year's total fruit production of Ağrı districts, Doğubeyazıt, Tutak, Taşlıçay, Hamur and Center are 99, 32, 20, 6 and 2 tons of fruit productions, respectively. No fruit production has Eleşkirt and Patnos districts. However, even though some fruit species, especially almonds and peach, grow up in this province according to our researches, these fruits's data we do not have the Turkish Statistical Institute until now. In this study, through presenting the existing status of the fruit production potential of Ağrı province, it was aimed to increase the awareness and set light to decision makers in future plans.

Keywords: Ağrı, Fruit Production, Development opportunities.

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Enzyme based hydrolytic microextraction of manganese in food samples

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ABSTRACT

The usage of hydrolytic enzymes for the innovative, green and simple microextraction of manganese in food samples has been presented. The ultrasound assisted-enzyme based hydrolytic microextraction method (UA-EH-ME) was applied for the separation and determination of manganese in food samples prior to its micro-sampling flame atomic absorption spectrometric determination (MS-FAAS). Analytical parameters influenced on the enzyme based hydrolytic microextraction method such as pH, type of enzyme, amount of enzyme, temperature and ultrasonic irritation time were optimized by using NCS ZC73033 scallion certified reference material. Total manganese in 5.0 mg of food samples was extracted to 800 μ L of aqueous phase at pH 1.0 by 1 mg of pepsin as microextraction agent (hydrolytic enzyme). The procedure can be completed in 15 min. The most important advantage of the UA-EH-ME procedure is the using of mg level of pepsin for breaking down certain bonds of bio-molecules for extraction of manganese in food samples. The limit of detection (LOD), the limit of quantification (LOQ), and relative standard deviation were found as 4.9 mg kg⁻¹, 16.3 mg kg⁻¹ and 4.8 %, respectively.

Keywords: hydrolytic microextraction, manganese, food samples

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Microextraction of Ni(II) from environmental samples and its flame atomic absorption spectrometric determination

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ABSTRACT

A new, green, deep eutectic solvent based liquid phase microextraction method was developed for preconcentration and determination of nickel. Nickel was complexed with sodium diethyldithiocarbamate and was extracted to deep eutectic solvent phase. In this regard, tetra butyl ammonium chloride- decanoic acid components was used as deep eutectic solvent liquid for microextraction of Ni (II)- diethyldithiocarbamate chelate. After phase separation, the enriched analyte was determined by flame atomic absorption spectrometry (FAAS). Analytical parameters such as pH of solution, volume of sample solution, the volume of DES solvent and matrix effect that would affect the extraction efficiency were systematically examined and optimized. Quantitative recoveries for analytes were obtained at pH 3.0. The validation of the developed method was estimated by the analysis of the certified water reference materials and addition-recovery test. The developed deep eutectic solvent based liquid-liquid microextraction method was successfully applied for determination of nickel in water and environmental samples.

Keywords: Microextraction, Nickel, spectrometric determination

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Cu(II) sorption performance of novel chitosan/ter-(vinyl pivalate-maleic anhydride-N-tert-butylacrylamide) microcapsules

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ABSTRACT

In this study, novel chitosan/ter-(vinyl pivalate-maleic anhydride-N-tert-butylacrylamide) microcapsules were synthesized. In microcapsule production, chitosan polymer served as a matrix for acrylamide ter-polymers with four different molar ratios. The microcapsules were characterized by FT-IR and SEM analyses. Cu(II) sorption efficiency of the microcapsules were tested at different pH, temperature, sorbent dosage and metal ion concentration. Comparison with blank chitosan microbeads revealed that incorporation of acrylamide ter-polymers into the cross-linked chitosan matrix enhanced the metal sorption. Sorption capacities of the sorbents were recorded; blank chitosan microbeads: 67.03 and chitosan/acrylamide ter-polymer microcapsules: in range of 75.39-98.64 mg g⁻¹. The findings demonstrated chitosan/acrylamide ter-polymer microcapsules can be applied in sorption of Cu(II) ions in water treatment.

Keywords: Adsorption, acrylamide, microcapsule, water treatment, Cu(II) removal

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Preparation of maltase-inorganic hybrid nanoflowers and investigation of influence on enzymatic activity of synthesis conditions

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ABSTRACT

Enzymes have found widespread in various scientific and technical fields, including chemistry, biochemistry, medicine, pharmaceutical science and industry [1]. Although enzymes have unique properties, such as high catalytic activity, reaction specificity, stability, selectivity, low toxicity and water solubility, their efficient use is very limited due to their innate disadvantages associated with instability during storage, loss of catalytic activity after implementation into the reaction, high production cost and lack of recovery from reaction medium, substrate- and product-inhibitions [2]. In order to overcome these limitations, several immobilization approaches have been developed.

In this study, maltase-copper phosphate hybrid nanoflowers (HNFs) synthesized and at the same time formation mechanism, catalytic activity and stability under different experimental parameters (pHs, temperatures) was investigated. The hNFs were characterized using SEM, EDX analysis, Bradford assay, UV-Vis spectrometry and XRD. The effect of reaction temperatures on the morphology of the hNFs was demonstrated with SEM images (Fig. 1).

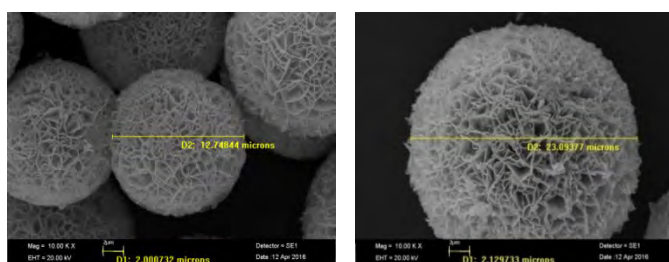


Figure 1. SEM images of hNFs synthesized at different incubation temperatures (A) +4 °C, (B) Room temperature

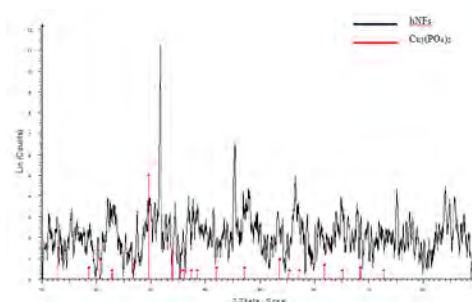


Figure 2. XRD patterns of the HNF (black line) consistent with the peak position of the $\text{Cu}_3(\text{PO}_4)_2 \cdot 3\text{H}_2\text{O}$

(red line, JCPDS (00-022-0548) located for comparison.

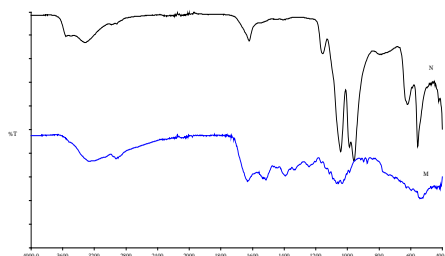


Figure 3. FTIR analysis of free maltase (blue line) and HNF (black line)

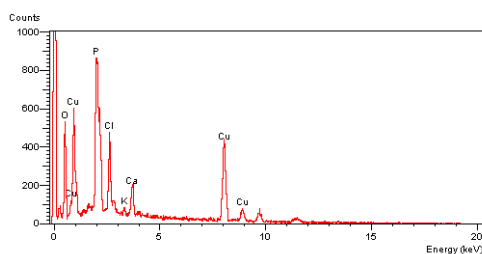


Figure 4. EDX analysis of the maltase hybrid nanoflower

Keywords: maltase, nanoflower, catalytic activity, stability

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Effect of ultrasound expose time on the partical distributions optical properties of solution for deposition of ZnO film

Gökhan Savaroglu^{*1} and Saliha Ilican²

ABSTRACT

ZnO film widely used as antireflection layer in solar cells, gas sensors, uv-photodetectors. Solution methods were preferred because of low-cost system. However, the obtained film quality is poor. The properties of solution are very important for deposition high quality ZnO film. In this study, it was investigated effect of ultrasound expose time on the solution properties such as optical properties and particle distributions of solution. As a solution, zinc acetate dihydrate was used. 2-methoxyethanol and monoethanolamine (MEA) were used as a solvent and stabilizer, respectively. The molar ratio of MEA to ZnAc was maintained at 1.0 and the concentration of ZnAc solution was 0.2 M. ZnAc was first dissolved in a mixture of 2-methoxyethanol and MEA solution at room temperature. The solution was stirred at 60 °C for 2 h to yield a clear and homogeneous solution, and then cooling to room temperature. The prepared solution was exposed with ultrasound (20kHz; 350W) for different times (0, 15, 30, 45, 60 min). Properties of exposed ultrasound solutions are compared to un-exposed ones.

Keywords: Ultrasound, particle distrubition, optical properties.

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Radiative Transition Probabilities for $3d^2$ and $3p^53d^3$ Transitions in W^{54+}

Gülay Günday Konan^{1*}, Leyla Özdemir²

ABSTRACT

We have reported the electric dipole (E1), magnetic dipole (M1) and electric quadrupole (E2) transition probabilities for some levels of $3d^2$ and $3p^53d^3$ in Ca-like tungsten ion (W^{54+}) using the AUTOSTRUCTURE code, which uses non-relativistic or kappa-averaged relativistic wavefunctions and the full Breit interaction in the Pauli approximation. In calculations, quantum electrodynamical (QED) contributions and correlation effects have been also taken into account. The results obtained have been compared with the available experimental and theoretical results.

Keywords: Radiative transition, Transition probabilities, QED, Correlation

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The Importance of Calcium on Human Health

Duygu ULAŞ¹, Murat ÇİMEN^{*2}

ABSTRACT

Calcium is a major and basic component of bones and teeth. It is an essential nutrient that is necessary for many functions in human health. Therefore, importance of calcium on human health was reviewed in this research. Inadequate calcium is a possible risk factor of osteoporosis. Calcium is needed for the clotting of blood to stop bleeding and for normal working of the muscles, nerves and heart. Also, adequate daily calcium intake may reduce the risk of colon cancer. Alcohol intake can affect calcium status by reducing its absorption. Coffee and tea intake can modestly increase calcium excretion and reduce absorption. High sodium intake increases urinary calcium excretion. Similarly, high protein intake increases calcium excretion and negatively affects calcium status. Extremely high levels of calcium can cause Hypercalcemia and can affect the electrical system of the heart causing abnormal heart rhythms. Inadequate calcium is a possible risk factor of osteoporosis and postmenopausal bone loss. Daily overdose of calcium likely plays a role in kidney stone formation. Doctors recommend adequate rates of daily calcium intake (but not low or high) for a healthy life.

Keywords: Calcium, human, health

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Purification and Characterization of The Carbonic Anhydrase Enzyme From Kangal Akkaraman Sheep in Sivas, Turkey and Inhibition Effects of Some Metal Ions on Enzyme Activity

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ABSTRACT

Carbonic anhydrase is a very important enzyme, which basically ensures that the CO₂ emerging from respiration is dissolved in water, transported and driven out of body as well as plays an important role in many physiological events such as acid-base balance, oxidative process, ion exchange, regulation of the cardiovascular system.¹⁻³ In this work, the carbonic anhydrase (CA) enzyme was purified from Kangal Akkaraman sheep in Sivas, Turkey with specific activity value of 6681.57 EU/mg and yield of 14.90% with using affinity column chromatography. For designating the subunit molecular mass and enzyme purity, sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS-PAGE) method was used and single band for this procedure was obtained. The molecular mass of CA enzyme was found nearly 30.11 kDa, liver, and striated muscle tissues. In this study, the optimum temperature, optimum pH were obtained from 30 and 7.5. V_{max} and K_m values for p-nitrophenyl acetate substrate of the CA were determined from Lineweaver-Burk graphs. Additionally, the inhibitory results of different heavy metal ions (Hg⁺, Fe²⁺, Pb²⁺, Co²⁺, Ag⁺ and Cu²⁺) on Kangal Akkaraman sheep in Sivas, Turkey were tested. Indeed, CA activities of Kangal sheep were investigated with using esterase procedure under in vitro conditions. IC₅₀ values of Hg⁺, Fe²⁺, Pb²⁺, Co²⁺, Ag⁺ and Cu²⁺ against CA enzyme were obtained 0.40, 1.22, 0.11, 0.42, 1.15, and 0.63, respectively. On the other hand, K_i values of this metal ions were determined 0.543 ± 0.12 , 0.915 ± 0.065 , 0.120 ± 0.038 , 0.401 ± 0.085 , 1.36 ± 0.41 , and 0.571 ± 0.13 , respectively

Keywords: Kangal Akkaraman sheep; carbonic anhydrase; enzyme purification; Characterization

Kinetic parameters	Values
Optimum pH (0.04 M, Tris-SO ₄ buffer)	7.5
Optimum ionic strength (M, Tris-SO ₄)	0.04
Optimum temperature (°C)	30.0
K_M (mM)	7.34
V_{max} (EU/mL)	0.95
Molecular mass (kDa)	30.11

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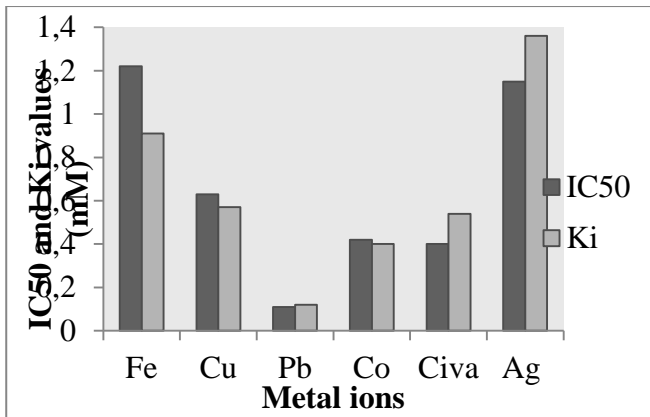


Figure 1. IC₅₀ and K_i values of metal ions

Tablo1. Kinetic parameters CA activities of Kangal sheep

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Evaluation of Fiber Technological Properties of The Breeding Lines Obtained From Advanced Generations in Cotton (*G. hirsutum* L.)

Sema BAŞBAĞ^{1*}, Erkan SERT¹, Gülbahar AKIN¹, Remzi EKİNCİ¹

ABSTRACT

Selection of varieties is very important for successful cotton production. Cotton variety improvement is required the genotypes have high yield capacity, as well as superior fiber technology and minimally affected by environmental stresses. This study has been carried out on the experimental field of Dicle University, Faculty of Agriculture, Field Crops Department. One hundred forty three promising cotton breeding lines selected from Sayar314xBeliizvor432 and Sayar314xOgosta644 hybrids obtained from F6 generation were used as materials. The study, fiber fineness, fiber maturity, fiber uniformity, fiber strength, fiber elasticity, short fiber content, fiber length examined changes in the limits of the properties are grouped as statistically, fiber fineness, fiber length, fiber strength, fiber elasticity examined promising cotton breeding lines were changed as 3.22 - 5.82 micronair; 22.38- 30.38 mm; 15.80-35.80 g/tex; 5.10-6.80% respectively.

Keywords: Cotton, breeding lines, fiber quality, generation

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Antioxidant activity of *Salvia cryptantha*

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ABSTRACT

Salvia genus, belonging to the Lamiaceae family including about 900 species, is widespread through the world [1]. Owing to the secretion of varied secondary metabolites, many *Salvia species* display a large variety of biological activities, such as antioxidant, anticancer, anti-inflammatory, cardioprotective, antibacterial, antimicrobial, anticholinesterase, antituberculous [2]. Dried plant material was boiled in water for 2 h. After filtration, the filtrate was extracted with ethyl acetate, and n-butanol to yield the ethyl acetate and n-butanol extract. A sample of water part was lyophilised to yield the water extract. Antioxidant assays including total phenolic content, DPPH• free radical, ABTS•+ scavenging and reducing power were used for ethyl acetate extract, n-butanol extract and water extract. Ethyl acetate extract consisted of the most phenolic contents and revealed the highest antioxidant activity in all assays among the extracts.

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A portable proactive healthcare device employing disposable strip type Li⁺-selective selective electrode and implementing internet of things

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ABSTRACT

Accurate and rapid monitoring of the Li⁺ activity in blood for the patients in lithium therapy is critically important as the gap between its therapeutic and toxic levels are very close. There are increasing need to provide patients with a reliable home-based monitoring tool for obtaining lithium ion levels. Recently our attention turned in the development of a potentiometric device, consisting of strip type Li⁺ -ISEs. Consequently a new disposable single-use strip type Li⁺-selective electrode with improved selectivity (lithium to sodium; 1:1000) has been developed together with a low cost portable proactive healthcare device implementing internet of things concept. In the device, disposable strip type Li⁺-selective selective electrode generates DC signal. This signal is filtered by analog low pass filter to increasing signal/noise ratio. Due to the high input impedance of the electrode, its signal generated is always need to be conditioned. A unity-gain buffer operational amplifier is used to decrease this impedance near by zero theoretically. An analog to digital converter device controlled by a micro-controller were used to read DC potential signal. There were also a temperature sensor plugged into the micro-controller for sensor temperature compensating. After reading the sensor's signal, the micro-controller's communication ports have many ways to implement an internet of things application. With its flashed control software and physical wireless peripherals, the sensor's data can be transferred to mobile phones or internet via Wi-Fi network or Bluetooth platforms and dynamic RFID tag technology. The user interface have LCD screen and control buttons by which the lithium concentration could be reliably and accurately determined within several minutes after the patient supplies a blood sample by finger prick, and results reported in real time to the clinician. Frequent home monitoring by the developed healthcare device could be used both to regulate dosage and to confirm patient is taking the prescribed medication. This will improve patient care as well as decrease medical costs.

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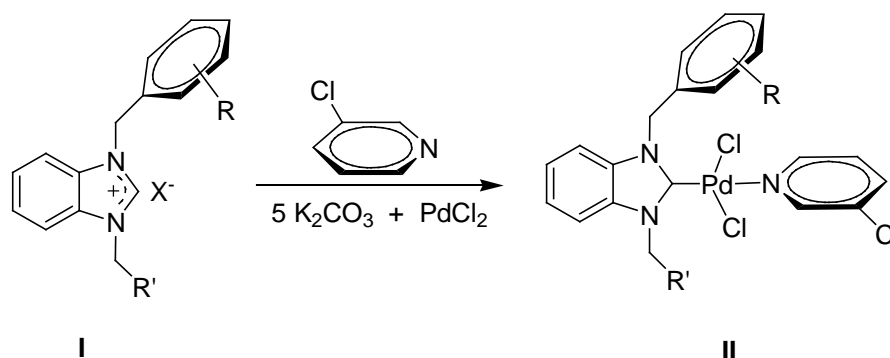
New Organic and Inorganic Compounds: Synthesis, Characterization and Cytotoxic Activity

Senem Akkoç^{*1}, İlhan Özer İlhan¹, Zülbiye Kökbudak¹ and Halime Güzin Aslan¹

ABSTRACT

NHC metal complexes including gold (Au), silver (Ag), platinum (Pt), ruthenium (Ru), rhodium (Rh), zinc (Zn) and palladium (Pd) have become popular compounds due to their *in vitro* and *in vivo* anti-tumour properties. Platinum-based drugs are frequently used in the treatment of different types of cancer. However, they have intrinsic disadvantages, and display adverse side effects including myelosuppression (reduction in bone marrow activity), ototoxicity (hearing loss), neurotoxicity (nervous system damage), and nephrotoxicity (reduced kidney function and damage) [1-3]. Therefore, novel metal complexes with improved effectiveness and fewer side effects would be attractive candidates as alternative anticancer therapeutics.

Benzimidazolium salts (I) and their Pyridine Enhanced Precatalyst Preparation Stabilization and Initiation (PEPPSI) palladium *N*-heterocyclic carbene (Pd-NHC) based complexes (II) have been synthesized and their structures characterized with a number of different instrumental techniques including NMR (¹H and ¹³C), IR, EI-MS, X-ray and elemental analysis. The cytotoxicity of all the compounds was tested using the human embryonic kidney (HEK-293T), human breast epithelial adenocarcinoma (MDA-MB-231), and human colon epithelial colorectal adenocarcinoma (DLD-1) cell lines. The benzimidazolium salts had more cytotoxic activity against cancerous cells compared with the metal complexes, which curiously exhibited no activity against any of the cell lines.



Scheme 1. Synthesis of new benzimidazolium salts and their silver, palladium metal complexes.



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Keywords: *N*-Heterocyclic carbene, PEPPSI, benzimidazolium salts, cytotoxic activity, X-ray, confocal and incucyte images.

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Synthesis of 1-(2-Hydroxybenzylideneamino)-5-(4-methylbenzoyl)-4-(4-methylphenylpyrimidin)-2(1*H*)-one and Its Ni Complex

Halime Güzin Aslan¹, Zülbiye Kökbudak¹, İlhan Özer İlhan¹ and **Senem Akkoç^{1*}**

ABSTRACT

Pyrimidine derivatives have various biological and pharmacological activities such as anti-bacterial, anti-tumor, antiviral. Therefore, many pyrimidine derivatives have been synthesized for searching their biological activity in recent years [1-3].

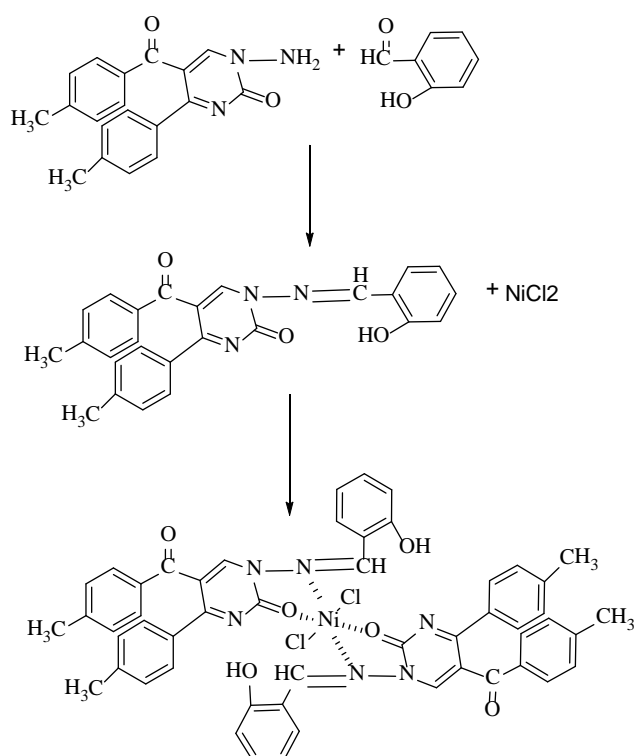


Figure 1. The 1-(2-hydroxybenzylideneamino)-5-(4-methylbenzoyl)-4-(4-methylphenylpyrimidin)-2(1*H*)-one and its Ni(II) complex.

1-(2-hydroxybenzylideneamino)-5-(4-methylbenzoyl)-4-(4-methylphenylpyrimidin)-2(1*H*)-one and its Ni(II) complex were synthesized from 1 mole of ligand and 2 moles of Ni (II) in ethyl alcohol (Figure 1). The reaction mixture was refluxed for 1 hour and was checked by thin layer chromatography. Then,



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the reaction mixture was stirred at room temperature for 1 week. At the end of the reaction period, product was obtained as a light green precipitated. These two compounds were characterized by spectroscopic and analytic methods. The resulting complex is stable in air.

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Computational Studies on Structural, Conformational Analysis and Non-linear Optical Properties of (Z)-1-[4-(Trifluoromethyl)benzylidene] thiosemicarbazide

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ABSTRACT

Derivatives of thiosemicarbazide are known to be potentially used as antibacterial agents, optical storage, analytical reagents for the analysis of metals and absorbents (Osman et al., 2017). In this study, geometric parameters (bond lengths and bond angles), vibrational frequencies, the dipole moment, mean polarizability, the total first static hyperpolarizability, highest occupied molecular orbital (HOMO) and the lowest unoccupied molecular orbital (LUMO), ¹H and ¹³C NMR chemical shifts values for (Z)-1-[4-(Trifluoromethyl)benzylidene] thiosemicarbazide molecule in the ground state have been calculated by using *ab initio* Hartree-Fock (HF) and Density Functional Theory (DFT)/B3LYP methods, with 6-311++G (d, p), 6-311+G (2d, p) and 6-31G (d) basis sets, respectively. All computational studies have been performed with the Gaussian 09W program. In addition, the highest occupied molecular orbital energies (E_{HOMO}) and the lowest unoccupied molecular orbital energies (E_{LUMO}), electronic properties of the studied molecule such as energy gap ($\Delta E = E_{\text{LUMO}} - E_{\text{HOMO}}$), chemical potential, electrophilic index, ionization potential, electron affinity, electronegativity, molecular softness, molecular hardness for the title compound have been determined using *ab initio* calculations. Structural values of this molecule compared with data in the literature. Structural values of these molecule compared with data in the literature. There is good agreement between the observed and the calculated geometric parameters.

Keywords: (Z)-1-[4-(Trifluoromethyl)benzylidene]thiosemicarbazide, $E_{\text{LUMO}} - E_{\text{HOMO}}$, Dipole moment, hyperpolarizability, polarizability

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Computational Studies on 4-Amino-2-, 3-Substituted Phenylboronic Acid

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ABSTRACT

In this study, the ground state geometrical energy, the dipole moment (μ), the polarizability (α), the hyperpolarizability (β) energies, the highest occupied molecular orbital energy (HOMO) and the lowest unoccupied molecular orbital (LUMO) of 4-amino-2-fluorophenylboronic (I) and 4-amino-3-fluorophenylboronic acid (II) 4-amino-2-chlorophenylboronic acid (III) 4-amino-3-chlorophenylboronic acid (IV) molecules were calculated by using ab initio Hartree-Fock (HF) and Density Functional Theory (DFT/ B3LYP) using 6-311++ G (d,p) basis set. ¹H and ¹³C NMR chemical shifts calculations have been performed by using the DFT with B3LYP functional and HF methods, where the 6-311+G (2d,p) and 6-31G (d) basis sets were employed. Besides, using the calculated the highest occupied molecular orbital energies (E_{HOMO}) and the lowest unoccupied molecular orbital energies (E_{LUMO}), electronic properties of the studied molecules such as energy gap ($\Delta E = E_{\text{LUMO}} - E_{\text{HOMO}}$), chemical potential μ , electrophilic index ω , ionization potential **IP**, electron affinity **EA**, electronegativity χ , molecular softness **S**, molecular hardness η were obtained. The dipole moment for I, II, III and IV molecules are calculated at 3.46, 1.68, 3.85 and 1.71 Debye with DFT-B3LYP/ 6-311++ G (d,p) and 3.09, 1.37, 3.47 and 1.39 Debye with HF/6-311++G (d,p) level of theory, respectively. The dipole moment value of III molecule was the highest the dipole moment values in the studied molecules All computational studies have been performed with the Gaussian 09W program.

Keywords: 4-amino-2-fluorophenylboronic, 4-amino-2-chlorophenylboronic acid $E_{\text{LUMO}}-E_{\text{HOMO}}$, Dipole moment, hyperpolarizability

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Preparation of Metal Containing Epoxy Polymers and Investigation of Their Properties as Fluorescent Probe

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ABSTRACT

Schiff base ligands are very effective in constructing supramolecular architectures such as coordination polymers, double helical and triple helical complexes [1]. In addition, Schiff base derivatives incorporating a fluorescent moiety are appealing tools for optical sensing of metal ions [2]. Metal containing polymers (MCPs) are well-known systems in which the combinations of local parameters are possible by means of fluorometric techniques. Generally, without incorporation of the fluorescent groups with polymers is unspecific, and it is not useful to analyze their fluorescent properties. Therefore, it is necessary to prepare a new type epoxy polymers with fluorescent groups in terms of metal sensing prop and the other photochemical applications [3].

Schiff base complexes were prepared as di-hydroxyl functional monomers by the template reaction of salicyl hydrazone with OH- substituted aromatic aldehydes in the presence of metal salts such as Cu(II), Ni(II), Cd(II), La(III), Sm(III) and Gd(III). The prepared Schiff base metal chelate complexes were polymerized with the di functional monomer diglycidyl ether Bisphenol-A (DGEBA) to obtain metal containing epoxy polymers. The preparations of epoxy polymers have been carried out at 150 and 185 °C. The synthesized complexes and polymers were characterized by FTIR, UV-VIS and mass spectroscopies. The solid phase UV-Vis and fluorescence spectra were recorded for the prepared polymer composites to characterize the photophysical properties (Fig 1).

The prepared polymers have some interesting photo physical properties, and they might have availability potential for the above mentioned technology fields.

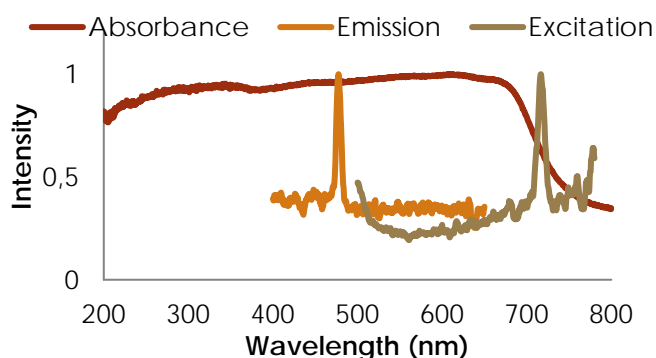


Fig.1. UV-VIS and Fluorescence Spectrum of metal containing epoxy polymer in solid phase.

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Keywords: Schiff base, complex, epoxy polymer, photophysical properties.

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A Stable Aqueous Anaesthetic Gel Formulation For Clinical Use

Aysenur ERTUNC^{1*1} and Ibrahim ISILDAK²

ABSTRACT

Use of laparoscopic and robotic surgery in pediatric population has been rapidly increasing over the last 10–15 years, and it's become a standard of care for many of the surgical operations (Spinelli and Weiniger). Extended duration local anaesthetic formulations in current development or clinical use (MacKenzie), and systemic toxicity through overdose of local anaesthetic agents (Malamed) are a real concern. By encapsulating local anaesthetics in a polymeric carrier to produce a system for prolonged release, its duration of action can be extended (Weiniger). This polymeric carrier can also improve the safety profile of the local anaesthetic as it is released at a slower rate. However, in this study, a stable aqueous gel formulation suitable for topical laparoscopic use in pediatric population comprising lidocaine hydrochloride, Chlorhexidine Dihydrochloride, skin permeation enhancer and a viscoelastic hydroxyethylcellulose polymeric carrier. The skin permeation enhancer was glycerol viscoelastic polymeric carrier was hydroxyethylcellulose. The aqueous gel formulation developed here was free of preservatives (methyl paraben or propyl paraben) and phosphate buffer, and it has low particulate count (particles of less than 80 microns). The pH of the aqueous gel formulation was about 6.5. The degradation of lidocaine hydrochloride in the formulation was measured after 3 months by high pressure liquid chromatographic method. There was no change found in the formulation characteristics (e.g. viscosity and pH), and stability of the gel.

Keywords: Aqueous gel, Extended stability, Anaesthetic formulation, Lidocaine

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SURVEY ANALYSIS OF SUPPLY CHAIN MANAGEMENT FRAMEWORKS

1st Salim Mukhtar Sani*¹, Asst. Prof. Dr. Ayşe TANSU TUNÇBİLEK ²

ABSTRACT

The active management of supply chain is to maximize customer value that needs to achieve a sustainable competitive advantage that is known as Supply Chain Management (SCM) (Mentzer et.al, 2001)

The research aim is to provide an exploratory study of Supply Chain Management (SCM) framework by employing a survey on the academic research conducted on the supply chain management frameworks with the objective of investigating their trends and current status in academic research over a period of time. The eight frameworks are the following: Customer relationship management, customer service management, demand management, order fulfilment, manufacturing flow management, supplier relationship management, product development and commercialization and returns management.

The study will perform analysis on the collected data with effect from comparison between the eight (8) supply chain frameworks with parameters like: The framework with highest number of publications, the highest number of Citations, Institution of authors, Years in which journals were published per framework and the framework with least amount of academic research within the research period.

Totally, 381 journals resulted to be the number of journals/articles published under the context of SCM frameworks from year 2015 to July 2017. Customer relationship management had the highest number of published articles, having 34% of the total number of articles. 53% of the articles were published in 2015, 36% in 2016 and the remaining 11% in the year 2017, The results indicate that there is an annual decline in the amount of articles published under the SCM framework articles. Therefore, SCM framework are having little amount of attention in the academic research context.

Keywords: SCM, framework, supply chain, published, research.

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An evaluation of Coal Fly Ash as an Adsorbent for the Removal of Methylene Blue from Aqueous Solutions: Kinetic and Thermodynamic Studies

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ABSTRACT

The removal of methylene blue (MB) by using fly ash (FA) from an aqueous solution was investigated in this study. The factors those are the effect of the dose and particle size of the adsorbent, initial dye concentration, initial pH, contact time and temperature were studied to understand how the adsorption happened. Then the results found as the optimized conditions were determined. The FA dose was found to be 2 g and the under 270 mesh sized particles were found to be effective particles for adsorption. The adsorption process reached its maximum value at 0.5 mg/L dye concentration and attained equilibrium within 10 minutes. The adsorption isotherm was found to follow the Langmuir model. The estimated adsorption free energy (ΔG_0), enthalpy change (ΔH_0), and entropy change (ΔS_0) for the adsorption process were $-37.77 \text{ kJ mol}^{-1}$, $-13.44 \text{ kJ mol}^{-1}$ and $122 \text{ J mol}^{-1} \text{ K}^{-1}$ respectively at 298 K. The adsorption process was exothermic, feasible and spontaneous. The positive value of ΔS_0 shows the affinity of FA for MB while the low value of ΔG_0 suggests a physical adsorption process.

Keywords: adsorption, dye, methylene blue, fly ash, langmuir isotherm

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Practical Biomedical Applications based on molybdenum disulfide

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ABSTRACT

Molybdenum disulfide has properties that make it of great interest for developing biosensors. graphene and other 2D materials, MoS₂ offers large surface areas that enhance its biosensing performance. suitable bandgap, the overall sensitivity of devices based on 2D MoS₂ is much larger than that of graphene and graphene oxides which have either no or small bandgap. Theoretically, we are first studying the electronic and optical behavior of the biosensor material, which is defined by structural, band structure calculation, effective mass, and carrier mobility calculations. 2D Monolayer MoS₂ direct band gap (1.7 eV), 3D Bulk MoS₂ indirect band gap (1.16 eV) was calculated. Calculations were made by adding spin-orbit interactions.

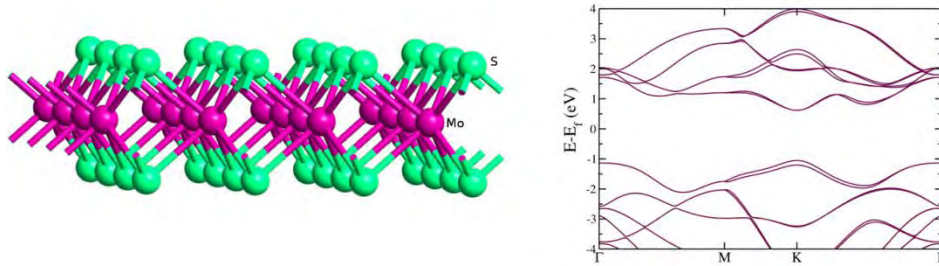


Figure 1. Monolayer (2D) of MoS₂ and its band structure calculation.

Keywords: : Molybdenum sulfide, 2D, bio-sensing.

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A Simple Green Preparation Method for Zinc Sulfide Nanoparticles

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ABSTRACT

ZnS has remarkable properties that can be utilized for versatile applications including field emitters, flat panel displays, electroluminescence, photoluminescence, catalyst and biosensors (Ummartyotin, et. al, 2016). Besides ZnS has low cost and environmentally benign material.

Compared to bulk ZnS, nano ZnS possess distinctive physical and chemical properties such as: enhanced surface to volume ratio, the quantum size effect, macroscopic quantum tunneling effect, more optical absorption, chemical activity and thermal resistance, enhanced performance, enhanced shell-life and the low melting point (Kaur et. al, 2016). ZnS is considered more suitable for visible and UV light based devices than ZnO (3.4 eV) since ZnS exhibit large band gap of approximately 3.54 eV and 3.91 eV for its two polymorphs, zinc blend and wurtzite respectively. For the fabrication of ZnS nanoparticles there exist various methods such as chemical precipitation, sol-gel, hydrothermal, inert-gas evaporation etc. in the literature (Wang et.al, 2013) Most of these methods needs some special equipments to apply high temperature, high pressure and inert media with difficult processing conditions.

In this study, we reported a simple and green method to synthesize ZnS nanoparticles which were characterized by XRD, XPS, FTIR, UV-Vis. and SEM.

Keywords: zinc sulfide, green synthesis, environmentally benign, nanoparticle, nano ZnS

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Evaluation of anti-browning compounds and some metals on Princess tree Polyphenol Oxidase activity

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ABSTRACT

Enzymatic browning reaction caused by an enzyme called Polyphenol oxidase (PPO) is the one of the biggest problem in the food industry during handling and processing of fruit and vegetables. Polyphenol oxidase (PPO) is a copper-containing enzyme which catalyzes the conversion of phenolic compounds to quinones and assists the polymerization of their products. Lately, researchers are very interested in developing new PPO inhibitors to slow the enzymatic browning. Natural anti-brown compounds commonly used for the PPO enzyme are honey, aliphatic alcohols, ascorbic acid and cysteine. In addition to these substances, some metals can affect enzyme activities positively or negatively. For example zinc, iron and copper are essential for survival of plants, but some heavy metals such as mercury, lead, etc. can affect the enzyme activities involved in the defense system of plants. In this work, the effects of some metals, anti-browning compounds and their complexes were examined on the PPO enzyme from princess tree (*Paulownia tomentosa*) leaf. The results demonstrated that glutathione (GSH) was more powerful anti-browning compound than the others. Ni(II) and Mn(II) metals increased the PPO enzyme activity. But, Pb(II) had the efficient PPO inhibitor. Na(I), Cu(II) and Fe(II) had no significant effect on the PPO activity. Additionally, the effects of metal-anti-browning complexes were examined on the PPO activity. The results showed that metal-L-Cys, metal-Ascorbic acid and metal-GSH complexes had inhibitory effects but metal-EDTA complexes had no significant effect on the PPO activity.

Keywords: Polyphenol oxidase (PPO), princess tree, anti-browning, metal, inhibition

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Sunset Yellow-Selective PVC Membrane Potentiometric Sensor

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ABSTRACT

Sunset yellow (SY) are synthetic food colors used most extensively as food additives, to improve the appearance, color, and texture of foods [1]. When added in excess, however, these synthetic food colors can be pathogenic [2]. To ensure food safety, the Chinese government has imposed rigorous standards on the permitted levels for various synthetic food colors [3]. For the same reason, it is important to develop effective methods for analyzing synthetic colors in food.

In this work, sunset yellow-selective PVC membrane potentiometric sensor was produced. Potentiometric performance characteristics were investigated in a static medium. Electrode showed a linear response in the concentration range 1×10^{-5} - 1×10^{-2} M with 25.1 mV slope in ten fold change in concentration ($R^2 = 0.9864$). Detection limit of electrode is 1×10^{-5} M.

Keywords: Sunset Yellow, Potentiometric sensor

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The Effects of Fulvic Acid Against Water Avoidance Stress-Induced Damage of Rat Colonic Mucosa

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ABSTRACT

Introduction&Objectives: Psychological stress is involved in the etiology of functional gastrointestinal disease. Many human under the chronic life stress have gastrointestinal disorders including symptoms like abdominal discomfort, pain, constipation or diarrhea. It's known stress conditions induce changes in gastrointestinal motility, epithelial ion secretion, and macromolecule permeability. Water avoidance stress (WAS) is an animal psychological stress model which acts like life stress of human if it is chronic. Fulvic acid is natural non-toxic agent can enter the cell cytoplasm and pass through all the morphological barriers. This organic structure has stable atomic structure and establishes an antioxidant and antiinflammatory effects by forming a bond instead of reactive oxygen species. In this study, we investigate the therapeutic effects of fulvic acid on the damage of rat colonic mucosa is exposed to the water avoidance stress.

Materials&Methods: Three experimental groups were established (18 Sprague-Dawley male rats,300 gr): Control (C), Water Avoidance Stress (WAS) and Water Avoidance Stress+Fulvic Acid (WAS+FA). Colonic samples were collected from each three groups and were histochemically stained with Hematoxylin-Eosin, Periodic Acid Shiff (PAS) and toluidine blue methods.

Results: Normal colon mucosa with crypts and a little amount of intact mast cells were seen in the C group. Although degenerated epithelium, severe inflammatory cell infiltration into the connective tissue and increased number and activity of mast cells observed in the WAS group. Reversal of degenerated epithelium with cripts, decreased inflammatory cell infiltration and intact mast cells were observed in the WAS+FA group.

Conclusion: It was understood that the fulvic acid established healing effect on the colonic mucosa under the chronic psychological stress conditions. but the amount used was not sufficient to show its antioxidant effect. As a result, at the future studies fulvic acid should be tested at higher doses to reveal the therapeutic effect.

Keywords: Fulvic Acid, Water Avoidance Stress, Oxidative Stress, Inflammation, Colon

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MODELING OF BSA-METAL ION- POLYCOMPLEXES OF POLY(METHYL VINYL ETHER-CO-MALEIC ANHYDRIDE) BY THEORETICAL METHODS: SEMI-EMPERICAL PM6 AND DOCKING STUDY

Vildan Enisoğlu Atalay*, İbrahim Barış Ölüç, Mesut Karahan

ABSTRACT

The best known function of albumin is protein constructs that allow the transport of a large number of chemical compounds. Many endogenous and exogenous compounds are transported into the bloodstream after complexing with serum albumin [1]. In order to understand the nature of the transport and distribution of these compounds within biological organisms, it is important to examine the interactions of ions and molecules with proteins.

In this work, the binding constants of experimentally studied metal-BSA complexes were calculated by using computational chemistry and molecular docking methods. Bovine serum albumin (BSA, pdb code: 4OR0), polycomplexes of poly (methyl vinyl ether-CO-maleic anhydride) (PMVEMA) and eight different metal ions (Cd^{+2} , Co^{+2} , Cu^{+1} , Cu^{+2} , Fe^{+2} , Fe^{+3} , Ni^{+2} and Zn^{+2}) were investigated by molecular docking study [2, 3]. The study was carried out in two stages: As the first step, the stability of the complexes was calculated by the semi-experimental PM6 method, in which Spartan4, GaussView5.0 and Gaussian09 programs were used. In the second step, the complex formation energies of the stable ligands were performed using AutoDock Vina. BSA- Cu^{+2} - (PMVEMA) complex is found to be the most stable complex in all the metal complexes that has been studied so far whereas BSA-(PMVEMA) complex structure was not subjected to experimental study with Cu^{+1} ion previously [4]. In the docking study, BSA- Cu^{+1} - (PMVEMA) complex was found to be the most stable (which gives the best binding energy in the obtained results. The BSA- Cu^{+1} - (PMVEMA) complex is more effective in interaction with the surrounding amino acids and BSA- Cu^{+2} - (PMVEMA) complex was found to be the second best stable complex. Therefore, experimental and theoretically consistent results show that it is important to investigate the Cu^{+1} complex experimentally in future studies.

Keywords: Molecular Docking, BSA, DFT

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Assessment of essential elements and chemical contaminants in Twenty fish species from the Sakarya, Turkey using ICP-OES

1st Huseyin ALTUNDAG*¹, 2nd Ebru YILDIRIM², 3rd Esra ALTINTIG³

ABSTRACT

In this study Cu, Fe and Zn trace element amounts were determined over the 15 different species 20 fish in total that were collected by Sapanca Lake, Sakarya River and Western Blacksea (Karasu). After samples were provided, microwave process was applied with reverse aqua regia following the preparation. Heavy metal analysis was conducted with ICP-OES device on the samples and Cu, Fe and Zn amounts were determined. Also verification was provided with DORM-3 standard reference material (Fish Protein Certified Reference Material for Trace Materials). As the result, obtained results for the heavy metal amounts of the samples were found below the limit values of Turkish Food Codex (TFC), Food and Agriculture Organization (FAO) and World Health Organization (WHO) and by the way the consumptions did not result threaten the health. The obtained results will be presented in 1st International Conference on Innovations in Natural Science and Engineering (ICINSE 2018).

Keywords: Trace elements; fish; ICP-OES, sample preparation, digestion.

Acknowledgement

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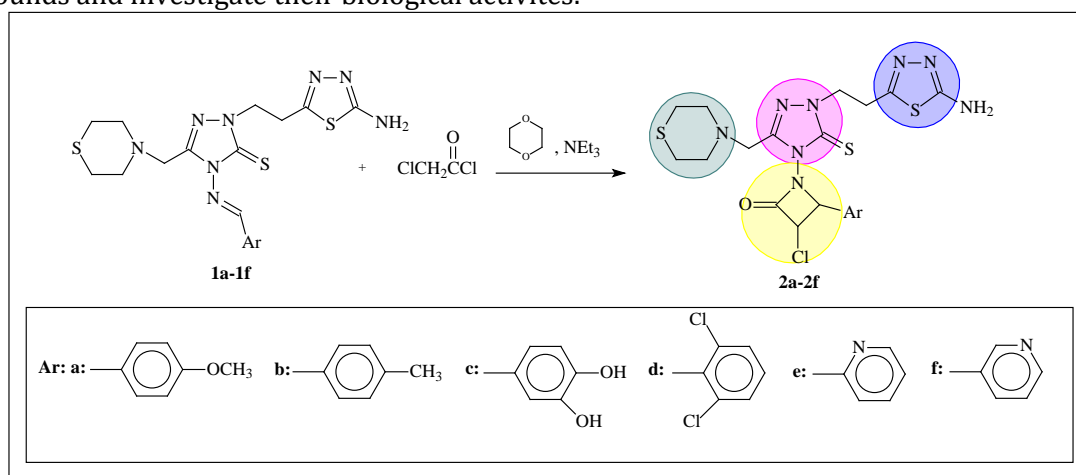
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Antimicrobial, Antioxidant, Anti Ureas & Acetylcholinesterase Activity of some New β -Lactam Analogs Containing Thiomorpholine and Azole rings

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ABSTRACT

The azetidione-2-one (β -lactam) ring system is the key of biological activities in β -lactam antibiotics which are a large group of antibiotics, such as penicillins, cephalosporins, nocardicins, carbapenems and monobactams that have been widely used as chemotherapeutic agents for treating microbial diseases (Jarrahpour et al., 2016, Rad et al., 2017). Therefore, it is essential to synthesis new compounds and investigate their biological activities.



All newly synthesised compounds were screened for their antimicrobial activity, antioxidant activity, anti urease and acetylcholinesterase capacity.

Keywords: Thiomorpholine, Thiadiazole, Triazole, Schiff Base, β -Lactam.

This study is supported by a grant from Scientific and Technological Research Council of Turkey (TUBITAK) (Project Number: 115Z770)

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Synthesis of novel Schiff base metal complexes and investigation of their catalytic properties for bleaching applications

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ABSTRACT

The catalytic activities of Schiff base metal complexes are known very well and a lot of work has been done with them. Examples of reactions in which the Schiff base metal complexes exhibit catalytic activity include polymerization reactions, reduction reactions of ketones, Heck reactions and oxidation reactions etc.^[1] The ligand molecules used in the oxidation reactions has the chiral structure and forms the -O-N-O type bond with metal ion. In these Schiff base metal complexes, vanadium (IV), titanium (IV), copper (II), zinc (II), manganese (III), ruthenium (III) etc. transition metals were used. The use of Schiff base complexes in oxidative reactions as bleaching catalysts is one of these applications. Hydrogen peroxide-containing systems have been used for many years to degrade chromophoric molecules. However, since the year 2000, especially manganese complexes of Schiff base ligands have been used in these applications as the catalysts.^[2]

In this work, synthesis of Schiff base ligand from 2-hydroxy-1naphthaldehyde and methyl ester of anthranilic acid was carried out.^[3] Then, new Schiff base metal complexes were obtained by using metal acetate salts (Cu, Ni, Zn, Mn, Cd, Co). For determining the structure of the synthesized compounds FTIR, ¹H-NMR, ¹³C-NMR, UV spectroscopic methods and melting point determination was used. The catalytic bleaching properties against the morphine stain of the synthesized complexes were investigated. The obtained results will be presented and discussed comparatively in the 1st International Conference on Innovations in Natural Science and Engineering (ICINSE 2018).

Keywords: Schiff base complex, bleach catalysis

Acknowledgement

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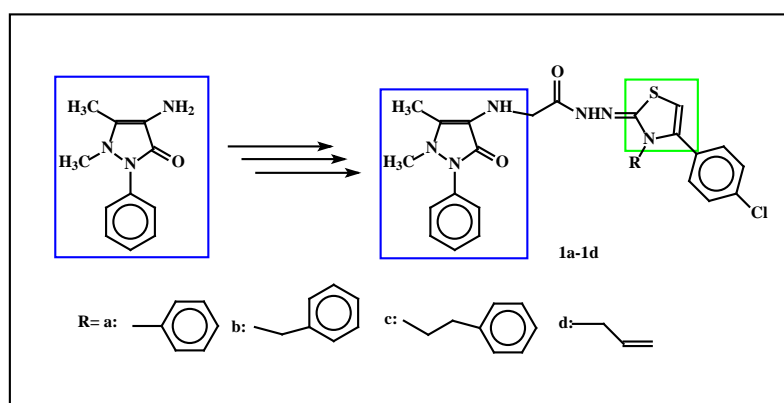
Antimicrobial Activity and Synthetic Route of some New Heterocyclic Compounds Containing Antipyrine

Hacer BAYRAK^{*1}, Yıldız UYGUN CEBECİ², Şengül ALPAY KARAOĞLU³

ABSTRACT

The first pyrazoline-5-one derivatives used for the treatment of pain and inflammation as anti-inflammatory, analgesic, antipyretic and antimicrobial agent is Antipyrine (Rostom et al., 2009, Bayrak et al., 2010). Five membered heterocycles containing nitrogen and sulphur atoms are involved in drug discovery process and have an important role in the manufacture of various biologically active drugs (Rane et al., 2013).

In this study we synthesized new kind of antipyrine containing compounds and screened for their antimicrobial activities.



Keywords: Thiazole, Antipyrine, Antimicrobial Activity

This study is supported by a grant from Karadeniz Technical University Scientific Research Project (KTU-BAP) (Project Number: FBB-5289)

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Adsorption of remazol orange RGB by rigid foam prepared from peanut shell

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ABSTRACT

Human health is in risk with the dye pollution from various industrial wastewaters such as rubber, plastic, dyeing and cosmetics. Even, some dyes show carcinogenic and mutagenic effects when inhaled and contacted skin. In this work, the kinetics and isotherm studies on the adsorption of remazol orange RGB dye from aqueous solution by batch adsorption method using polyurethane type rigid foam prepared from peanut shell were investigated. The effects of initial dye concentration (10-150 mg/L), pH (3-9) and temperature (20-60 °C) on the adsorption of remazol orange RGB were investigated as a function of contact time. Batch adsorption experiments were conducted with 0.25 g foam and 50 ml dye solution using a temperature-controlled shaking water bath under all conditions. After shaking in at 130 rpm for various times, the samples were centrifuged at 5000 rpm for 5 min by taking from shaking bath. The concentrations of dye remained in supernatant were determined using T80 UV/Vis Spectrometer at $\lambda_{max} = 478$ nm.

The adsorption increased with increasing initial dye concentration and temperature while the adsorption increased with decreasing pH. The maximum adsorption was found to be about 98 % under all the experimental conditions studied. The kinetics of adsorption was in the best consistent with the pseudo second-order model. Adsorption isotherm was also obeyed the Freundlich model. As a result, it may be said that polyurethane type rigid foam prepared from peanut shell will also be used as a potential sorbent for the removal of other dye pollution from environment.

Keywords: Adsorption, Isotherm, Kinetics, Thermodynamics, Remazol orange RGB,

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