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V. International

ISCMP

TURKEY 2021

JOINT SCIENCE CONGRESS OF MATERIALS AND POLYMERS

BOOK OF ABSTRACTS & PROCEEDINGS

EDITORS

Ayhan ORAL, Ph.D.
Oğuz GÜRSOY, Ph.D.
Yusuf YILMAZ, Ph.D.

September 29 - October 1, 2021
Burdur / TURKEY

www.iscmp.org

ISCMP 2021

V. International Joint Science Congress of Materials & Polymers
29 September - 1 October 2021 Burdur,Turkey

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Editors:

Ayhan Oral, Canakkale Onsekiz Mart University, Turkey

Oğuz Gürsoy, Burdur Mehmet Akif Ersoy University, Turkey

Yusuf Yılmaz, Burdur Mehmet Akif Ersoy University, Turkey

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Sidas Medya Ltd. Şti.: Fevzipaşa Blv. Çelik İş Merkezi Kat:3 D: 302 Çankaya, İzmir, Turkey
Sertifika No: 44798, E-mail: sidasmedya@gmail.com

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Organized by

Burdur Mehmet Akif Ersoy University
Çanakkale Onsekiz Mart University
Prishtina University
University of Tetovo
Chemists Society
Materials Research Society of North Macedonia
Society of Chemists and Technologists of Macedonia
Tunisian Chemical Society

ISCMP 2021
V. International Joint Science Congress of Materials and Polymers
September 29 – October 1, 2021, Burdur, Turkey

ORGANIZERS, SUPPORTING AGENGIES & SPONSORS

WELCOME ADDRESS

Dear Colleagues,

International Joint Science Congress of Materials and Polymers (ISCMP), which is organized with the aim of sharing scientific developments related to materials science and technology with a wide range of stakeholders, has been held regularly every year since 2017. Following the first ISCMP (Ohrid, Macedonia) in 2017, the continuation of the congress were carried out successfully in Durres, Albania (ISCMP 2018), Pristina, Kosovo (ISCMP 2019) and Tetovo, Macedonia (ISCMP 2020).

The fifth of the congress (ISCMP 2021), hosted by Burdur Mehmet Akif Ersoy University in cooperation with the Chemists Society (Turkey), Canakkale Onsekiz Mart University (Turkey), Turkish Cooperation and Coordination Agency (TİKA), Presidency of Turks Abroad and Related Communities (YTB), University of Tetovo (North Macedonia), University of Prishtina (Kosovo), Society of Chemists and Technologist of Macedonia, Materials Research Society of Macedonia and Tunisian Chemical Society will be performed in Burdur, Turkey.

It is our pleasure and privilege to invite you to attend the unique international platform the 5th International Joint Science Congress of Materials and Polymers, which will be held in Burdur Mehmet Akif Ersoy University Lavanta Tepesi Hotel (5 Stars Hotel), Burdur, Turkey between 29 September to October 1, 2021.

The congress will include all areas of material science and technology including different related fields (e.g. chemistry, energy, food science and technology). Official language of the congress is English. Abstracts and full-texts will be evaluated double-blind & peer-review and published in the congress abstract/proceedings book (will be included in EBSCO) after the congress. Optionally, full-texts could be published in different supported journals after performing regular publication processes of the journals. A congress special issue will be published in Open Chemistry (SCI-Expanded, Impact Factor: 1.554, De Gruyter Open Access). Abstracts and the full texts which not presented during the conference will not be included in the congress abstracts/ proceedings book and not published in the journals special issues.

Congress attendees will have the chance to benefit from scientific exchange during either the formal activities or the informal meetings with colleagues from different backgrounds. They will also have a chance to see the natural and historical beauties of Burdur. Hereby, we would like to thank everyone who has supported us by accepting our invitation to be an invited speaker and to be organizing workshops. We would also like to thank all public and private sector organizations that provided economic support to our congress.

We hope you will enjoy the meeting and we are looking forward to welcoming you to Burdur!

Prof. Oğuz Gürsoy

Prof. Ayhan Oral

Chairpersons of of ISCMP 2021 Organizing Committee

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ISCMP 2021 – SCIENTIFIC PROGRAM

September 28, 2021 (Tuesday)

Check-in to the Hotel (through the day)	
12:00-18:00	Registration
16:00-16:45	**Tutorial :** Fundamental of controlled radical polymerization ***Prof. Metin Hayri Acar**, Istanbul Technical University, Turkey*
16:45-17:00	**Coffee Break**
17:00-17:45	**Tutorial :** Fundamental of controlled radical polymerization ***Prof. Metin Hayri Acar**, Istanbul Technical University, Turkey*

September 29, 2021 (Wednesday)

09:00-17:00	Registration	
10:00-11:00	**Opening Remarks** *Prof. Oguz Gursoy, Ph.D., Co-Chair of ISCMP 2021, Burdur Mehmet Akif Ersoy University, Turkey* *Prof. Ayhan Oral, Ph.D., Co-Chair of ISCMP 2021, Canakkale Onsekiz Mart University, Turkey* *Prof. Adem Korkmaz, Ph.D., Rector, Burdur Mehmet Akif Ersoy University, Turkey* *Protocol Members*	
11:00-11:15	Coffee Break	
Congress Hall A		
Session Chair	**Metin Hayri Acar,** *Istanbul Technical University, Turkey*	
11:15-11:40	**Piotr Koczon**	Infrared spectroscopy use for rapid evaluation of composition and quality of different materials ***(INVITED SPEAKER)***
11:40-12:05	**Rajka Bozanic**	Trends in the production of functional dairy products ***(INVITED SPEAKER)***
12:05-12:30	**Ahmed Jashari**	Synthetic strategies for some carborane analogues of coumarins with anticancer activity ***(INVITED SPEAKER)***
12:30-13:45	**Lunch**	
Session Chair	**Ahmed Jashari,** *University of Tetova, Republic of North Macedonia*	
13:45-14:10	**Arturs Viksna**	Accurate quantification of phosphorous and calcium in apatites ***(INVITED SPEAKER)***
14:10-14:25	**Serdar Salman**	Spare parts of living bodies: Biomaterials ***(INVITED SPEAKER)***
14:25:14:50	**Metin Hayri Acar**	Shape memory polymers with body temperature triggering
14:50-15:40	Coffee Break	
Session Chair	**Ayşegül Uygun Öksüz,** *Suleyman Demirel University, Turkey*	
15:40-16:05	**Latifa Latrous**	Trends in solid phase extraction techniques for sample preparation in environmental analysis ***(INVITED SPEAKER)***
16:05-16:25	**Ahmet Celil Sarı**	The removal of various heavy metal ions via adsorption by the cross-linked polycarboxylate-type adsorbent
16:25-16:45	**Cagdas Deniz Periz**	Preparation benzyl isothiocyanate loaded chitosan microspheres and investigation of antibiofilm activities
16:45-17:05	**Havva Elif Lapa**	The effect of TiO_2 thickness on efficiency of FTO/TiO_2/P_3HT:PCBM/Ag organic solar cells
17:15-18:00	***POSTER SESSION (Posters will be on poster boards all day)***	
18:00	***OPENING COCKTAIL***	

September 29, 2021 (Wednesday)

Congress Hall B		
Session Chair	**Rajka Bozanic,** *University of Zagreb, Croatia*	
13:45-14:10	**Jelena Miocinovic**	Technological challenges and improvements of goat milk products quality ***(INVITED SPEAKER)***
14:10-14:30	**Firuze Ergin**	Effect of lactose hydrolysis on physicochemical and microbiological properties of probiotic yoghurt
14:30-14:50	**Ioana Bodea Maria Bodea**	Development of bioactive bacterial cellulose membranes enriched with oregano and rosemary herbal extracts
14:50-15:10	**Mentor Ismaili**	Determination of heavy metals in several dairy products (yoghurt, cheese and cream) from Kosovo
15:10-15:40	Coffee Break	
Session Chair	**Piotr Koczon,** *Warsaw University of Life Sciences, Poland*	
15:40-16:05	**Patricia Munsch-Alatossava**	How N_2 gas flushing of raw milk could benefit various dairy products ***(INVITED SPEAKER)***
16:05-16:25	**Giorgiana Mihaela Catunescu**	Bioactivity assessment of bacterial cellulose membranes enriched with parsley and lovage herbal extracts
16:25-16:45	**Orhan Özünlü**	Use of biosensors in determination of meat quality
16:45-17:05	**Tuğba Güngör Ertuğral**	Preparation, characterization and thermal properties of n-tridecane/n-tetradecane polymethylmethacrylate (PMMA) microcapsules by miniemulsion polymerization for seafood cold storage
17:15-18:00	***POSTER SESSION (Posters will be on poster boards all day)***	
18:00	***OPENING COCKTAIL***	

September 30, 2021 (Thursday)

Congress Hall A		
Session Chair	**Avni Berisha,** *University of Prishtina, Kosovo*	
09:00- 09:25	**Arif Hepbaşlı**	Exergy management system standard: A way to sustainability ***(INVITED SPEAKER)***
09:25- 09:50	**Roohollah Bagherzadeh**	Stretchable electronics and energy harvesting devices ***(INVITED SPEAKER)***
09:50- 10:15	**Kledi Xhaxhiu**	The photo-sensitivity of polyazulene thin films ***(INVITED SPEAKER)***
10:15- 10:35	**Tayyar Güngör**	Transition metal doping effects on the impedance of Zn-related electrolytic materials
10:35-11:00	Coffee Break	
Session Chair	**Kledi Xhaxhiu**, *University of Tirana, Albenia*	
11:00-11:25	**Ayşegül Uygun Öksüz**	Radio frequency plasma modification of materials for potential applications ***(INVITED SPEAKER)***
11:25-11:50	**Avni Berisha**	Formation of 2D covalently bonded thin films on various materials via aryl radicals ***(INVITED SPEAKER)***
11:50-12:10	**Esin Eren**	Investigation of drug release properties of streptomycin sulfate-loaded PMMA/PEO fibers
12:10-12:30	**Gozde Yurdabak Karaca**	Catalytic poly(3,4-ethylenedioxythiophene): Polystyrene sulfonate motors as anticancer drug carrier
12:30-14:00	Lunch	
Session Chair	**Arturs Viksna,** *University of Latvia, Latvia*	
14:00-14:25	**Sarper Sarp**	Disposable face masks - Analysis of the release of synthetic micro and nano particles and chemical contaminants - linked to the COVID-19 pandemi ***(INVITED SPEAKER)***
14:25-14:50	**Attila Levente Gergely**	Piezoelectric nanofiber production using electrospinning ***(INVITED SPEAKER)***
14:50-15:10	**Mustafa Ismael Khaleel**	Structural and thermal analyses of rigid polyurethane foams containing micron-sized turkey feather powder
15:10-15:30	**Öznur Özge Özcan**	Metronidazol loaded human serum albumin nanoparticles production and characterization
15:30-16:00	Coffee Break	
Session Chair	**Roohollah Bagherzadeh,** *Institute for Advanced Textile Materials and Technologies, Iran*	
16:00-16:25	**Bruno Ameduri**	Recent advances in the conventional radical (co)polymerization of VDF and fluoroalkenes and applications therefrom ***(INVITED SPEAKER)***
16:25-16:50	**Büşra Şimşek**	Coating method to prevent deformation caused by alcohol-based cleaning materials on artificial leather
16:50-17:10	**Volkan Eskizeybek**	Integrated modeling and optimization of out-of-autoclave processing of carbon prepreg laminates
17:15-18:00	***POSTER SESSION (Posters will be on poster boards all day)***	
20:00	***GALA DINNER***	

September 30, 2021 (Thursday)

Congress Hall B		
Session Chair	**Latifa Latrous,** *University of Tunis El Manar, Tunisia*	
09:00-09:20	**Sabiha Demirci**	Methacrylated gelatin (GELMA) and GELMA hydrogel synthesis and characterization
09:20-09:40	**Yonca Alkan Göksu**	The degradation behaviors of an amorphous and a semicrystalline PLAs with similar molecular weights under different temperature and environmental conditions
09:40-10:10	**Merve Danisman**	Surface modification of silica with enzyme catalyzed reaction
10:10-10:30	**Veprim Thaçi**	An experimental and theoretical study of methoxy and triflouro 2,5-diarylidenecyclopentanone derivatives
10:30-11:00	Coffee Break	
Session Chair	**Tayyar Güngör,** *Burdur Mehmet Akif Ersoy University, Turkey*	
11:00-11:20	**Nusret Kaya**	Rheological investigation of linear viscoelastic properties of polypropylene and polypropylene/hexagonal boron nitride composites
11:20-11:40	**Havva Kaya**	Biochemical basis of metal nanomaterial synthesis manufactured using plant extract with sample of silver nanoparticle synthesis
11:40-12:00	**Mehmet Akif Hafızoğlu**	Fabrication and characterization of mullite reinforced TiO_2 added ZrO_2 ceramics
12:00-12:20	**Esra Şen**	Synthesis and characterization of MASn(Ix, Br3-x) perovskite materials
12:20-14:00	Lunch	
Session Chair	**Volkan Eskizeybek,** *Çanakkale Onsekiz Mart University, Turkey*	
14:00-14:25	**Arben Merkoçi**	Nanobiosensors for diagnostics applications ***(INVITED SPEAKER)***
14:25-14:45	**Elif Muslu**	Investigation of non-enzymatic electrochemical glucose sensor application of prussian blue-based flexible thin films
14:45-15:05	**Yunus Emre Bülbül**	Antibiotic release and antibacterial features of polymer coated magnesium microparticles
15:05-15:25	**Ferda Hacıvelioğlu**	Synthesis and characterization of sulfonimide substituted polyphosphazene polyelectrolytes
17:15-18:00	***POSTER SESSION (Posters will be on poster boards all day)***	
20:00	***GALA DINNER***	

October 1, 2021 (Friday)

Congress Hall A		
Session Chair	**Attila Levente Gergely,** *Sapientia University, Romania*	
09:00- 09:25	**Masami Otsuka**	Strategic design of an anti-fibrosis compound
09:25-09:45	**Halil Özbaş**	Coronavirus disease 2019 and biomaterials
09:45-10:05	**Belgin Sever**	Examining pharmacodynamic and pharmacokinetic properties of L-HIPPO for HIV treatment
10:05-10:25	**Yalçın Coşkun**	Cytotoxic effects of the wild verbena ethanol extract on cancer cells in vitro conditions
10:25-10:35	Coffee Break	
Session Chair	**Halil Özbaş,** *Suleyman Demirel University, Turkey*	
10:35-11:05	**Mikako Fujita**	Multimerization of HIV proteins
11:05-11:25	**Halil I Ciftci**	Structure-based anti-HIV drug development
11:25-11:45	**Mesut Karahan**	New generation vaccine models
11:45-12:30	***CLOSING REMARKS***	
12:30-14:00	Lunch	
14:00-18:00	***SOCIAL ACTIVITY (SALDA LAKE EXCURSION)***	

ISCMP 2021 - POSTER PROGRAM

September 29, 2021 (Wednesday)

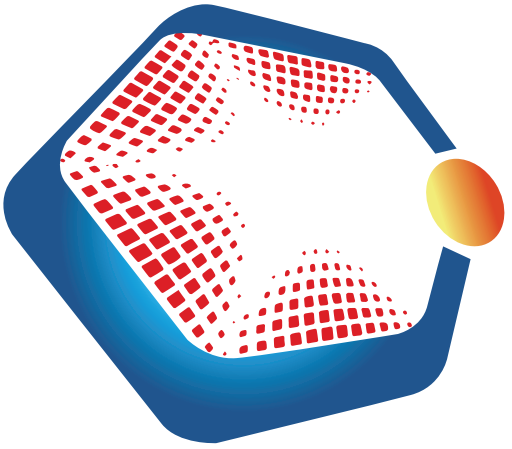
NO	PRESENTER	TITLE
1	Belgin Sever	Determination of anticancer effects of 1,3,4-oxadiazole derivatives against glioblastoma multiforme
2	Belgin Sever	Determination of anticancer effects of 1,3,4-oxadiazole derivatives against glioblastoma multiforme
3	Halil İbrahim Çiftci	Pyrazoline derivatives as anti-glioma agents
4	Emine Kutlu	Preparation of composite nanoparticles suitable for magnetic resonance imaging
5	Namik Durmishi	Control of some physical, chemical and microbiological parameters of drinking water in pet packaging
6	Elif Büşra Çelebi	Synthesis and characterization of sulfonic acid substituted polyphosphazene/polypyrrole composites
7	Ferda Hacıvelioğlu	Preparation of perfluorinated sulfonic acid functional proton conducting phosphazenes
8	Tulay Tutenocakli	Effect of infusion time on the phenolic content and free radical scavenging capacity of olive leaf tea
9	Hale Seçilmis Canbay	Compatibility studies of tetracycline with different excipients by using DSC and FTIR
10	Mehlika Dilek Altıntop	New imidazothiazole-hydrazone hybrids as potent EGFR-targeted anticancer agents
11	Nahide Gülşah Deniz	Synthesis of N-substituted quinones and impact of these derivatives on the clinically important pathogen responses
12	Cigdem Sayil	Synthesis and biological activity of new vitamin K3 (menadione) analogues
13	Halime Çevikbaş	Investigation of antibacterial effects of rose essential oil and rose absolute
14	Merve Koranoz	Enhancing tribological and lubricant properties of oil by nanoparticle additives
15	Oğuz Gürsoy	Conjugated linoleic acid (CLA) contents, fatty acid compositions and chemical properties of commercial and homemade butters
16	Oğuz Gürsoy	Effect of ultrasonication of heat-treated and cooled milk on physicochemical, rheological and sensory properties of kefir samples
17	Ahmet Küçükçetin	Possibilities of using bacteriophages as bioprotective agents in milk and dairy products
18	Yusuf Yılmaz	Effect of ultrasound-assisted vacuum impregnation pre-treatment on antioxidant activity of diced apples during convective drying
19	Yusuf Yılmaz	Effect of ultraviolet (UV-C) light in a static system on color properties of egg yolks
20	Deniz Akın Anakök	Design of a new biosensor platform for creatinine determination
21	Ilkay Konçe	Determination of swelling ratio on carboxymethyl cellulose-based hydrogel using a central composite design
22	Ilkay Konçe	Determination of inclusion complex formation of metronidazole with 2-hydroxypropyl-ß-cyclodextrin by HPLC method
23	Emel Atılal	New generation of biodegradable / ecofriendly synthetic esters as lubricants

24	Cagdas Deniz Periz	Investigation of antibacterial and antibiofilm effects of phenyl isothiocyanate
25	Halime Çevikbaş	Antioxidant and coagulant activities of rose essential oil and rose absolute
26	Derya Kahraman	Polypyrrole film based electrochemical sensor for the determination of amoxicillin
27	Tayyar Güngör	Discharge voltage induced structural and optical properties of bimetallic Ag:ZnO nanoparticles by the spark generation
28	Hakan Akat	Based on natural waste seeds polymeric composite materials with and their physical properties
30	Berna Körpınar	Radiation shielding of styrene-based unsaturated polyester-tungsten(VI) oxide composites

September 30, 2021 (Thursday)

NO	PRESENTER	TITLE
1	Avni Berisha	Theoretical study of the internal rotational barriers of mono-, di-, and trihalogenated ethanes
2	Veprim Thaçi	Spectroscopic and theoretical study of the 2E, 5E) -2,5-Bis (2-methoxybenzylidene) cyclopentanone
3	Mentor Ismaili	Heavy metal presence in the dairy products collected from vicinity of power plants (Kosova A and B) in Kastriot
4	Hamit Ismaili	Determination of some physic-chemical parameters as fats, humidity salinity at soft, semi-strong and strong cheese produce in North Macedonia
5	Hamit Ismaili	Determination of some physic-chemical parameters as fat, humidity salinity at soft, semi-strong and strong cheese produce in Kosovo
6	Azizahmad Karimi	Synthesis of aluminum-graphene foam for heat absorbance
7	Enis Haxhijaj	The synthesis of novel derivatives of their corresponding tetrazoles and their antimicrobial activity
8	Enis Haxhijaj	Synthesis of new tetrazole derivatives and their antimicrobial activity
9	Besar Racaj	The synthesis and anticoagulant properties test of new coumarine derivatives
10	Besar Racaj	Anticoagulant properties of newly synthesized coumarine derivatives
11	Rinor Besim Zejnullahu	The adsorptive removal of Pb(II) and Cr(VI) ions from aqueous solution by graphene oxide
12	Rinor Besim Zejnullahu	Graphene oxide as an effective adsorbent for Cd(II) and Ni(II) ions
13	Arjan Ganiji	Synthesis of some novel thiazolo-4-hydroxycoumarin derivatives with potential biological effects
14	Marghali Sonia	Exploration of bioactive compounds and antioxidant properties of cauliflower and broccoli
15	Sinem Yildiz	Phantom preparation for microwave breast cancer imaging
16	Faten Gorsane	Food production improvement: a promising ecofriendly technique for crops to cope with environmental stresses
17	Gülşah Çobankaya	Antibiotic resistance of *Staphylococcus aureus* isolated from raw milk and dairy products
18	Akriche Toumi Samah	Heterogeneous catalysis of diesel fuel for aerobic oxidative desulfurization using micro-crystals of heteropoly amphiphilic Keggin-type catalyst

19	Akriche Toumi Samah	Enhancement of structural, electrical, dielectric and luminescent performance of hybrid organic cation diphosphate nanomaterial
20	Ahmet Özdemir	A new series of EGFR-targeted antitumor agents against non-small cell lung cancer
21	Ivan Tolstobrov	Towards membrane materials for fuel cells via ATRP
22	Andrei Bushuev	Obtaining copolymers of vinylidene fluoride and hexafluoropropylene with a high HFP content
23	Gülen Türker	Evaluation of antioxidant properties of seaweeds from Çanakkale, Turkey
24	Esin Eren	Investigation of antibacterial effects of streptomycin sulfate-loaded PMMA/PEO/bis-chalcone derivatives-based fibers
25	Yunus Emre Bulbul	Electrospinning of polyethylene oxide/graphene-lithium perchlorate as a potential lithium polymer electrolytes
26	Elif Büşra Çelebi	Synthesis and characterization of benzenesulfonimide substituted proton conductive polyphosphazenes
27	Vjoda Hoda	Cancer in Balkan region



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Burdur, Turkey 2021

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Burdur - Turkey **2021**

INVITED LECTURES

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V. International ISCMP TURKEY 2021
Joint Science Congress of Materials and Polymers
September 29 - October 1, 2021 Burdur / Turkey

Infrared Spectroscopy Use for Rapid Evaluation of Composition and Quality of Different Materials

Piotr Koczon*
Prof.
Department of Chemistry, Warsaw University of Life Sciences, Poland

Infrared spectroscopy is spectral method used currently to analyze various mixtures including biological mixtures, without necessity of their separation into single components. Collection of spectral data of given material, followed by processing them with statistical techniques (e.g. PLS or PCA), that is chemometric approach, allows to rapid, accurate, non-invasive and environment friendly discrimination (DA) of various materials, as well as determination of content of desired chemicals contained in those materials (RA). In both cases (DA and RA) construction of statistical model is crucial. Discrimination requires spectral data exclusively, while determination of content of given chemical usually requires data from reference method. IR spectroscopy can be applied to solid state, liquid, paste and gas materials. Examples of discrimination of following materials are given in the presentation: (1) discrimination of microbiologically contaminated lab coats from contamination-free lab coats, (2) discrimination of microplastic contaminated soils and plant samples from microplastic-free samples of soils and plants, (3) discrimination of fresh tomatoes and cucumbers from temperature treated vegetables. Examples of determination of (i) calorific value of oat samples and wood samples, (2) content of ethanol in alcoholic beverages, (3) number of microorganisms existing over surgery materials with use of IR spectroscopy are presented. Weak and strong points of IR spectroscopy are shown.

Keywords: Infrared Spectroscopy, Chemometric Approach, Discrimination

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Joint Science Congress of Materials and Polymers
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Trends in the Production of Functional Dairy Products

Rajka Bozanic*
Prof.
Department of Food Engineering, University of Zagreb, Faculty of Food Chemistry and Biochemistry, Croatia (Hrvatska)

Irena Barukcic
Assoc. Prof.
Department of Food Engineering , University of Zagreb, Faculty of Food Chemistry and Biochemistry, Croatia (Hrvatska)

Katarina Lisak Jakopovic
Assoc. Prof.
Department of Food Engineering, University of Zagreb, Faculty of Food Chemistry and Biochemistry, Croatia (Hrvatska)

Today, food is expected not only to satisfy hunger, but also to have a positive effect on human health. Due to the greater awareness of the important impact of food on health, the trend of production of functional products is growing. Milk is a natural, multi-component, nutrient-rich beverage. Market trends indicate that milk-based beverages are ideal vehicles for newly discovered bioactive food ingredients targeting lifestyle diseases. Experience indicates that consumers will not buy food products that imply they are sick. Therefore, functional foods need to be promoted as convenient, nutritious and tasty formulations with specific health benefits. The functionality of dairy products can be achieved in different ways. Its composition can be modified and improved, so thus the amount of certain components can be increased (e.g. proteins) or decreased (e.g. salt and cholesterol). Also, it is possible to modify the technological process of production (e.g. ultrafiltration) or use various supplements that will increase the functionality of the dairy product (e.g. probiotics). Improving functionality of dairy products includes nowadays the utilization of by-products such as whey and buttermilk, which were proven to have a high nutritional and therapeutic value. The subject of this paper is to explore functional dairy products in the market and possible modifications to improve and enhance them.

Keywords: Dairy Products, Funcional Food, Health, Trends, Production, By Products

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Synthetic Strategies for Some Carborane Analogues of Coumarins with Anticancer Activity

Ahmed Jashari*
Assoc. Prof.
Department of Chemistry, University of Tetovo, Macedonia

Evamarie Hey-hawkins
Prof.
Faculty of Chemistry and Mineralogy, University Leipzig, Germany

The intense investigation in medicinal chemistry showed that many of the coumarin derivatives with expressed anticoagulant activity, are showing anticancer effects in the same time. Thus, very known and commercially available medicaments Warfarin, Phenprocoumon, Sintrom (acenocoumarol) and Bromadiolone are intensively studied for their cytostatic, apoptotic and antiproliferative activities. On the other hand, recently, carborane clusters that can be regarded as phenyl mimics have attracted attention. Most boranes are not very suitable for biological applications due to instability; however, carboranes, where two BH- units of closo-B12H122- are formally substituted by two CH fragments, have shown remarkable biological stability. Thus, many compounds containing carboranes as pharmacophore have received much attention in the last decade, especially in the search of novel effective chemotherapeutic agents. Taking into consideration that many flavonoids and their constitutional isomers, coumarins, have shown noticeable anticancer properties, it was planned to synthesize novel compounds by replacing the aromatic ring of some of their derivatives by a carborane cluster to enhanced metabolic stability as well as enhanced hydrophobicity. Many strategies were employed in order to synthetize the desired carborane analogues of Warfarin and the other coumarin derivatives but only few of them were fully applicable due to the complex steps into the retrosynthetic strategies.

Keywords: Synthesis, Carboranes, Coumarins, Anticancer

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Accurate Quantification of Phosphorous and Calcium in Apatites

Arturs Viksna*
Prof.
Department of Analytical Chemistry, University of Latvia, Latvia

Vladlens Grebnevs
Phd. Student
Department of Analytical Chemistry, University of Latvia, Latvia

Karlis Agris Gross
Prof.
Institute of Inorganic Chemistry, Riga Technical University, Latvia

Further advances in calcium phosphates and a better understanding of mineralized tissue depend on precise, but simple chemical analysis. Attention needs to be directed to calcium and phosphorus quantification; a more precise analysis together with trace element determination. A detailed understanding of the chemistry together with strict control of processing are prerequisites for the design of higher performance materials and deeper understanding of biominerals. Routine analysis of calcium and phosphorus should be simple, low-cost, accurate and precise. Today, ICP-OES and photometry are used more commonly; titrimetry, XRD and FAAS are used less. These methods are well-established and easily accessible, but there are some limitations and difficulties for an effective introduction into a routine analysis practice of calcium phosphates. For example, despite the relative accuracy and simplicity of ICP-OES and photometry, plasma gas costs are high and photometry for simultaneous the quantification of both elements is hampered by the need of additional complexing reagents and cannot be applied to carbonate powders. XRD is chiefly a semi-quantitative, and needs an expensive ultra-high purity reference material. We argue that a new analytical method is essential for modern routine chemical analysis. TXRF offers simple sample preparation, has a relatively short analysis time, allows multi-element determination to a relatively high degree of accuracy, offers semi-quantitative determination of inorganic impurities, has low hardware maintenance costs, requires a small sample size, and does not require expensive reagents. A portable benchtop TXRF available in the instrumentation market which is attractive for calcium and phosphorus routine analysis in the quality control labs. It can be concluded that developed TXRF method is sufficiently accurate and precise and could be applied for routine analyses in quality control of different HAp. Quantification results of TXRF analysis were in a good agreement and somewhat superior to other modern and classical methods.

Keywords: Apatites, Calcium, Phosphorous

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Spare Parts of Living Body: Biomaterials

Serdar Salman*
Prof.
Department of Metallurgical and Materials Engineering,
Marmara University, Turkey

Biomaterial is a defined as a material intended to interface with biological systems to evaluate, treat, augment or replace any tissue, organ or function of the body and biocompatibility has been defined as the study and knowledge of the interactions between living and nonliving materials. The first historical use of biomaterials dates to antiquity, when ancient Egyptians used sutures made from animal sinew. Metals, ceramics, plastic, glass, and even living cells and tissue all can be used in creating a biomaterial. They can be reengineered into molded or machined parts, coatings, fibers, films, foams, and fabrics for use in biomedical products and devices. Biomaterials are restoring function and facilitating healing for people after injury or disease. Biomaterials may be natural or synthetic and are used in medical applications to support, enhance, or replace damaged tissue or a biological function. Biomaterials for the broad range of applications: Medical implants, including heart valves, stents, and grafts; artificial joints, ligaments, and tendons; hearing loss implants; dental implants; and devices that stimulate nerves. Methods to promote healing of human tissues, including sutures, clips, and staples for wound closure, and dissolvable dressings. Regenerated human tissues, using a combination of biomaterial supports or scaffolds, cells, and bioactive molecules. Examples include a bone regenerating hydrogel and a lab-grown human bladder. Molecular probes and nanoparticles that break through biological barriers and aid in cancer imaging and therapy at the molecular level. Biosensors to detect the presence and amount of specific substances and to transmit that data. Examples are blood glucose monitoring devices and brain activity sensors. Drug-delivery systems that carry and/or apply drugs to a disease target. Examples include drug-coated vascular stents and implantable chemotherapy wafers for cancer patients.

Keywords: Biomaterial, Medical Implants, Hydrogel, Biosensors, Drug-Delivery Systems

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Trends in Solid Phase Extraction Techniques for Sample Preparation in Environmental Analysis

Latrous Latifa*
Prof.
Department of Chemistry, Université Tunis El Manar, Tunisia

Sample preparation is an essential step of an analytical process especially for the extraction of chemical residues with low concentrations, preconcentration of the extracts and elimination of any matrix interferences that may affect the selectivity, sensitivity and the overall performance of the analytical methods. Solid-phase extraction (SPE) is one of the most widely used techniques for the sample preparation that provides an efficient and reproducible method for selective concentration of target analytes in complex matrices. This technique has gained prominence in the face of traditional methods since it minimizes the consumption of hazardous organic solvents and the sample volume, automation and on-line coupling with analytical instruments. As another feature, application of nanoparticles as extraction sorbents has undoubtedly improved the extraction efficiency and the method sensitivity of chromatographic analyses. Combining magnetic nanoparticles with many microextraction sorbents has opened up new possibilities to extract target analytes from sample matrices containing high volumes of matrix interferents. Different variations of SPE, including solid-phase microextraction, dispersive micro solid-phase extraction and magnetic solid-phase extraction have been developed. All these improved attributes are congruent with the Green Analytical Chemistry principles. Emerging trends in sample preparation such extraction of emerging pollutants from environmental matrices and solventless extraction techniques such as solid-phase microextraction will be presented.

Keywords: Sample Treatment, Environmental Analysis , Solid Phase Extraction, Microextraction

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How N_2 Gas Flushing of Raw Milk Could Benefit Various Dairy Products

Patricia Munsch-Alatossava*
Dr.
Independent Researcher, Finland

Tapani Alatossava
Prof.
Department of Food and Nutrition, University of Helsinki, Finland

Dairy farms and dairies, like other food production systems, face growing concern related to climate change and greenhouse gas emissions; besides more severe environmental constraints, food security and food safety are simultaneously acute issues. An optimisation of the use of natural resources and a reduction of the environmental impact by the dairy sector incites for the implementation of sustainable solutions from farms until dairies. The production and handling of milk, a highly perishable medium, promotes the entrance of microbial contaminants of different origins, with notable consequences on the quality and safety of raw milk and dairy products. Cold storage which aims to preserve the quality and safety of raw milk from farms until dairies also promotes the growth of psychrotrophic bacteria, especially pseudomonads, many of which produce heat stable enzymes that cause spoilage of milk and dairy products; although widely considered as benign, these bacteria carry antibiotic multi-resistance features. N_2 gas flushing showed a real potential for hindering bacterial growth in raw milk at storage temperatures ranging from 6 to 25°C: here the changes, triggered by cold storage alone or combined with N_2 gas flushing on mesophilic and psychrotrophic bacterial populations, will be summarised; moreover, the advantages highlighted for raw milk will be re-examined such as to discuss the possible benefits for various dairy products.

Keywords: Cold Chain, Food Spoilage, Sustainability, Raw Milk, Bacteria, Psychrotrophs

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Exergy Management System Standard: A Way to Sustainability

Arif Hepbasli*
Prof.
Department of Energy Systems Engineering,
Yasar University, Turkey

Different approaches to energy management systems (EnMSs) exist in the literature. Among these, ISO 50001:2018, which is the most recent Energy Management System Standard (EnMSS) with its first version published in 2011 has been widely used in many countries. Yasar University (YU) in Izmir, Turkey is the first university achieved TS EN ISO 50001:2011 Certification on 5 January 2016 in the country. Exergy, which is the quality of energy, can also be defined in many ways. There is a link between exergy and sustainability. An apolitical scale is needed to guide our judgment on the road to sustainability. In this regard, exergy can provide a common scale for our common future. Exergy-based analysis and assessment methods have proven to be powerful tools in the design, simulation and performance evaluation of energy systems. These methods have been applied to a wide range of systems or processes, namely from assessing the performance of investigators using an exergetic h-index (an exergetic academic footprint) to an energy-related system. Although EnMSS has been applied to various organizations since its publication, there are not any exergy management system standards (ExMSSs) issued yet. The author proposed an approach to ExMSS for the first time in one of his studies published in 2016. In this talk, a brief overview on exergy will be given first. Next, EnMSS will be shortly introduced. Some similarities between EnMMS issued and ExMSS proposed will be then presented. Finally, some sound concluding remarks will be listed.

Keywords: Exergy, Exergy Management System, Sustainability, Energy

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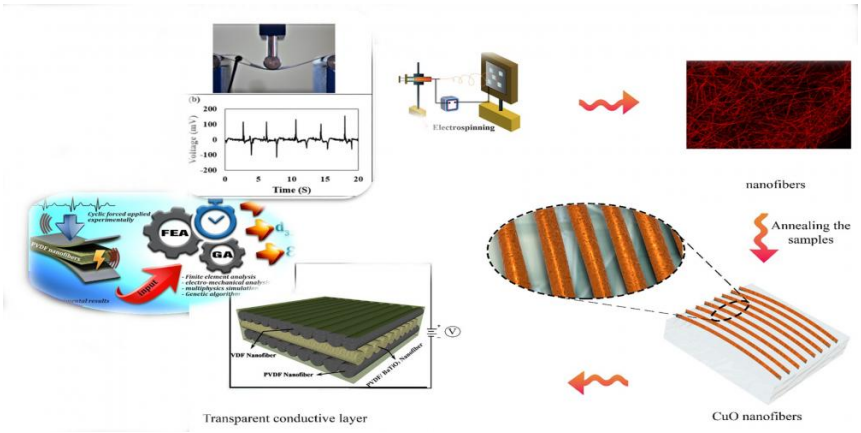
Stretchable Electronics and Energy Harvesting Devices

Roohollah Bagherzadeh*
Prof.
Advanced Fibrous Materials LAB, Institute for Advanced Textile Materials and Technologies (ATMT), Amirkabir University of Technology, Iran (Islamic Republic of)



This talk is mainly focused on scientific strategies to develop and integrate multifunctional fibrous materials with enhanced properties to electronic devices. Wearable electronics fabricated on lightweight and flexible substrate are widely believed to have great potential for portable devices. Several promising applications, for example e-skin, smartwatches, and bracelets, have been successfully achieved for the replacement of conventional electronic gadgets. Lightweight and wearable power supply modules with high energy storage performance are desirable for wearable technology. One strategy is to directly integrate a conventional rechargeable energy storage device, such as a battery or a supercapacitor (SC), into fabrics. Also nanochemistry is an emerging sub discipline of the chemical and materials sciences that deals with the development of methods for synthesizing nano scale bits of a desired material and with scientific investigations of the nano material obtained. Nano fibrous materials have numerous possible commercial and technological applications including use in electronic. In the last few decades, there has been significant progress in one-dimensional (1D) nanostructures with nanoscale and molecular scale properties that can satisfy the demands of the 21st century, for example, carbon nanotubes, inorganic semiconducting and metallic nanotubes/wires, conjugated polymer nanofibers/tubes, etc. These nanostructures have a deep impact on both fundamental research and potential applications in nanoelectronics or molecular electronics, nano devices and systems, nanocomposite materials, bio-nanotechnology and medicine.

Keywords: Stretchable Electronics, Stretchable Electronics and Energy Harvesting Devices, Fibrous Materials, Advanced Fibers, Flexibe Electronics,

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Nanofibrous Piezo-and Tribo-Electric Wearable Electronics? Chapter 9th of "Electrospun Nanofibers", Woodhead Publishing (published by Elsevier), 2019.

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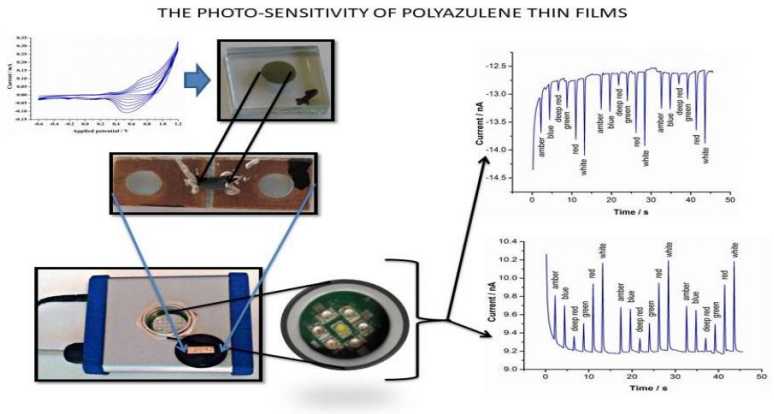
The Photo-Sensitivity of Polyazulene Thin Films

Kledi Xhaxhiu*
Prof.
Department of Chemistry, University of Tirana, Albania

Carita Kvarnström
Prof.
Department of Chemistry, University of Turku, Finland

Pia Damlin
Assoc. Prof.
Department of Chemistry, University of Turku, Finland



Herein the photo-sensitivity characteristics of polyazulene thin films synthesized electrochemically on ITO covered glass substrates are reported. In-situ voltammetric data reveal a uniform and homogeneous thin film showing an oxidation peak around 0.7V, followed by an oxidation-like peak in the region 0.70-0.75 V and a reduction peak at 0.55 V. FTIR-ATR measurements display typical bands within 400-4000 cm^{-1}. Prompt switching response and distinguishable wavelength selectivity is characteristic of on-off photo-switching in absence of applied bias, under illumination exposure time of 0.01 s and 2.0 s. Negative and/or positive currrent jumps up to 1 nA are typical for cool white light (5500 K) followed by lower amplitudes for other wavelengths, strongly depending on applied bias. Stable and well reproducible photo-switching response is typical for a bias of 3.0 V and an illumination time of 2.0 s. Bias switching from 0-3 V yields current jumps shifting from negative to positive values of almost similar amplitude form almost all considered wavelengths except of amber light which shows the opposite. All these data contribute to the broadening spectrum of conducting polymer applications in optoelectronic and photo-sensors.

Keywords: Polyazulene, Photo-sensitivity, Photo-Chromatic, Conducting Photo-Sensors

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Radio Frequency Plasma Modification of Materials for Potential Applications

Aysegul Uygun Oksuz*
Prof.
Department of Chemistry, Suleyman Demirel University, Turkey

Radio frequency plasma modification of materials have grown considerably for their enhanced use such as electrochromic, photovoltaic and biomedical devices in number over the past decade. RF plasma reactors are known for their multitude of possible configurations, whether home-built or using a commercially available setup to modify a wide range of materials. Moreover, RF plasma modification can be performed in a high-throughput manner, and is highly customizable in terms of easily adjusting key plasma parameters, such as applied power, time. We present here an overview of possible outcomes of plasma modification, such as enhanced properties and deposition of a thin film of materials for different applications such as electrochromic, photovoltaic and biomedical devices.

Keywords: Plasma Modification, Electrochromic Materials, Photovoltaic Materials, Micromotors

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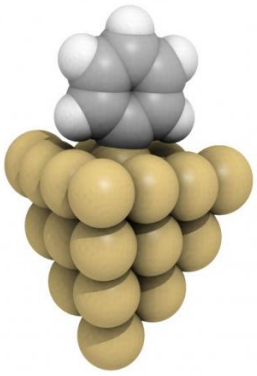
Formation of 2D Covalently Bonded Thin Films on Various Materials via Aryl Radicals

Avni Berisha*
Prof.
Department of Chemsitry, University of Prishtina,
Kosovo



Chemical surface modification is an essential technique for changing/functionalizing the surface characteristics of materials without affecting their mechanical or other desirable bulk qualities. Many of the molecules that are susceptible to surface modification, such as thiols, silanes, phosphonic or carboxylic acids, etc., are unique to the surface type of the materials or do not create covalent bonding with the interface. Surface modification can be accomplished by two methods: the attachment of self-assembled monolayers (SAMs) and the deposition of polymeric or multi-layered films. Although the creation of monolayers allows for strong molecular control over surface modification, it has a reduced mechanical resilience. Aryl diazonium chemistry not only offers a technique of choice that can be used to all material types (metals, semiconductors, insulators, and so on), but it also results in a strong covalent bonding with the surface of the material. We will discuss the aryldiazonium salt grafting mechanism, grafting methodologies, intriguing examples of the use of modified surfaces, and some practical applications in this area throughout this presentation. We will elaborate on our experimental findings concerning the grafting of organic films on an aluminum surface with its native oxide in protic or aprotic media using the following methods: i) spontaneous reduction of aryldiazonium salts, (ii) simultaneous electrochemical grafting of diazonium salts and alkyl iodides, (iii) spontaneous reaction of perfluoroalkylamine in an organic solvent, and (iv) photochemistry.

Keywords: Grafting, Surface Modification, Aryl Radicals, Aryldiazonium Salts, Surface Analysis, Aluminum

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Disposable Face Masks - Analysis of the Release of Synthetic Micro and Nano Particles and Chemical Contaminants - Linked to

Sarper Sarp*
Dr.
College of Engineering, Swansea University, United Kingdom

With the increase on the manufacturing and use of disposable face mask (DPFs) due to the Covid19 pandemic, the inappropriate and unregulated disposal of these items is a concerning cause of the intensification of plastic as an environmental problem nowadays. This study focuses on the emission of different contaminants from 7 DPFs brands (a total of 9 batches) that were immersed in deionised water in order to emulate environmental conditions once these DPFs are discarded and released into the environment. 7 different brands of DPFs (a total of 9 batches) were purchased from several manufacturers and suppliers and pollutants were filtered and deposited in membranes. These results have been published (https://doi.org/10.1016/j.watres.2021.117033).

Keywords: Disposable Face Masks, Contaminants, Nano Particle, Micro Particle, Environmental Pollution,

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Piezoelectric Nanofiber Production using Electrospinning

Attila Levente Gergely*
Dr.
Department of Mechanical Engineering,
SapientiaHungarian University of Transylvania, Romania

The aim of this work was to investigate the effect of processing parameters of the electrospinning method on the resulting poly(vinylidene fluoride) (PVDF) fiber diameter. Nanofibers due to their high volume-to-surface ratio show interesting properties that could be exploited in different application, such as sensors, filters, scaffold, and others. PVDF is a semi-crystalline polymer with 50-60% crystallinity composed of 5 different crystalline phases. The piezoelectric properties are attributed to the beta and gamma crystalline phases. In sensor applications PVDF is used as films after they are stretched above 200% at 100 °C followed by applying a high electric field. Recently it was discovered, that, if PVDF fibers are generated by electrospinning the resulting fiber mat shows piezoelectric properties. The explanation for the piezoelectric properties lays in the forces effecting the material during the electrospinning process. During electrospinning a polymer solution with sufficiently high viscosity and electric conductivity is fed through a capillary that is usually connected to the positive potential of a DC high voltage power supply. The collector is grounded and placed at a distance from the capillary. A jet is formed that travels from the capillary to the collector, where it is deposited. During the process the fibers are stretched. Thus, the used material is stretched under electric field, which in the case of PVDF fibers produces the piezoelectric properties. In our work a three factorial Box-Behnken experimental design was employed to study the influence of applied voltage, the capillary-to-collector distance and the applied flowrate on the resulting fiber diameter. We successfully prepared bead-free PVDF nanofibers with fiber diameters ranging from 700-1200 nm. The experimental design analysis did not show significant influence of the studied process parameters under the used boundary conditions on the fiber diameter, thus indicating the robustness of the process.

Keywords: PVDF, Electrospinning, Nanofiber, Piezoelectricity, Polymer Processing,

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Recent Advances in the Conventional Radical (co)Polymerization of VDF and Fluoroalkenes and Applications Therefrom

Bruno Ameduri*
Prof.
Ingénierie et Architectures Macromoléculaires,
Institute Charles Gerhardt, Montpellier, France

Fluorinated polymers are a remarkable polymers because of their thermal, chemical and oxidative stability making them useful in specific applications such as non-sticky paints and coatings, chemically resistant O-rings and seals, separators and binders for Lithium ion batteries, wires and cable insulation, and so on. They are mainly synthesized by radical (co)polymerization of fluoroalkenes. Among fluorinated polymers, poly(vinylidene fluoride) (PVDF) is one the most often used since it can be synthesized according to usual radical pathways, just like VDF containing-copolymers that lead to many applications, as displayed in Scheme 1. n $H_2C=CF_2$ + p C=C Z Y Spacer X G rad. conv. or controlled Thermoplastic or Elastomer x (VDF)x C X Y C Z Spacer G (VDF) X,Y,Z : H,F,CF3 G : Functional Group PEMFC High Performance Sealants and O-Ring Dielectric coPolymers Lithium-Ion Batteries Solar Cells Scheme 1: radical copolymerization of VDF with synthesized fluorofunctional monomers This presentation aims at showing some recent works on that copolymerization with fucntional 2-trifluoromethacrylic acid (MAF)2 and the applications of the resulting materials as coatings 2,3, polymer electrolytes for Lithium ion batteries4 . Figure 1. Overall strategies to synthesize novel functional 2-trifluoromethyl monomers from 2- trifluoromethacrylic acid (MAF) and their radical copolymerization with VDF (left). Steel plates coated with poly(VDF-co-MAF Phosphonate) copolymer at the beginning of the experiment (A), after 1 h (B), and after 18 h (C). (D): Uncoated steel plate as reference sample after 1 h (right).

Keywords: Fluorinated polymers, Poly(vinylidene Fluoride) (PVDF), Radical Copolymerization

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Strategic Design of an Anti-fibrosis Compound

Masami Otsuka*
Prof.
Department of Drug Discovery, Science Farm Ltd,
Kumamoto University, Japan

Bleomycin is an antitumor antibiotic isolated in Japan in 1966. While it is useful for the treatment of squamous cell carcinoma and malignant lymphoma, adverse effect of pulmonary fibrosis is warned. Inversely, bleomycin is used as a standard reagent to prepare fibrosis experimental model mouse. We elaborated an anti-fibrosis molecule by reconstruction of the structure of bleomycin and successful to cure mouse fibrosis induced by bleomycin. Bleomycin is a glycopeptide consisting of a non-natural heptapeptide and disaccharide. Bleomycin molecule can be divided into two functional domains; the N-terminal pyrimidine-hydroxyhistidine domain binds iron to activate molecular oxygen and the C-terminal bithiazole-terminal amine domain interacts with DNA. Overall bleomycin produces reactive oxygen species (ROS) and oxidatively cleaves DNA. The bleomycin-generated ROS results in lung toxicity presumably because lung is an oxygen-rich organ. We focused on the oxygen-activating domain of bleomycin and designed the1st generation iron-binding, oxygen-activating molecules consisting with aminoalanine, pyrimidine and histidine. Structural symmetrization of the 1st generation molecules afforded the 2nd generation oxygen-activating molecules characterized by histidine-pyridine-histidine (HPH) structure. Further modification of the 2nd generation molecules resulted in diverse function, i. e., inhibition of zinc protein including zinc finger proteins and farnesyltransferase,1), 2) inhibition of NF-?B activation,3) increase of steady state expression of antiviral host factor APOBEC3G.4), 5) Eventually, we are successful to overcome the problematic adverse fibrosis of bleomycin by introducing two (S-tert-butylthioethylamino) substituents at 2, 6-position of pyridine, and the compound was named HPH-15.6) Skin fibrosis mouse, prepared by subcutaneous injection of bleomycin, was ameliorated by oral administration of HPH-15. Current non-clinical study of HPH-15 using rat, dog, and monkey gave satisfactory results.

Keywords: Fibrosis, Bleomycin, HPH-15

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V. International ISCMP TURKEY 2021
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Multimerization of HIV Proteins

Mikako Fujita*
Prof.
Medicinal and Biological Chemistry Science Farm
Joint Research Laboratory, Kumamoto University,
Japan

1. Multimerization of HIV-1 Gag protein HIV has just as little as nine genes expressing approximately twenty proteins. These proteins work at specific time and location in immune cells in a body of the HIV infected patient, causing AIDS. One of the HIV proteins is Gag mainly composed of MA, CA, NC and p6 domains, making up the major skeleton of HIV particle. Before the release of HIV particles from an infected human cell, Gag proteins assemble at cellular membrane. In this Gag assembly, multimerization of its CA domains is found to be the crucial step. In 2018, Dick et al. reported that myo-inositol 1,2,3,4,5,6-hexakisphosphate (IP6) binds to CA domain of HIV type 1 (HIV-1) Gag, facilitating the Gag assembly.1) Recently, our group solved X-ray structures of MA-IP6 in collaboration with Dr. DeMirci's laboratory (Koc University, Turkey) and Prof. Senda's laboratory (KEK, Japan).2) From the structure, we proposed a novel role of IP6 in Gag assembly; IP6a lso facilitates multimerization of MA domain of Gag. As we have skill and experience in the chemical synthesis of IP6 derivatives,3,4) we are trying to develop IP6-derived Gag inhibitors. 2. Multimerization of HIV-2 Vpx protein In addition to HIV-1, there exists another type of HIV, that is HIV-2. This virus has a unique protein called Vpx. Main role of Vpx is to degrade human anti-virus protein SAMHD1 expressed in the host cell. In the C-terminal of the Vpx protein, there is a unique region called poly-proline motif (PPM) which is the consecutive seven prolines. We have studied on PPM and found that the PPM is related to Vpx multimerization5) and resistance to the proteasome degradation in target cells of HIV-2 infection6). Recently, we hypothesized that PPM confers stability to Vpx protein by inducing its multimerization. The detail is currently under investigation.

Keywords: Multimerization, HIV Proteins, Gag, IP6, Vpx, Poly-Proline

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V. International ISCMP TURKEY 2021
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Shape Memory Polymers with Body Temperature Triggering

Metin Hayri Acar*
Prof.
Dept. of Chemistry, Istanbul Technical University, Turkey

Gozde Aktas Eken
Dr.
Dept. of Chemistry, Istanbul Technical University, Turkey

Temperature triggered shape memory polymers (SMPs) have had a long history in both academia and commercial use. They can be designed with a wide range of transition temperatures to fulfill the demands of specific applications. Although, majority of the research are conducted on SMPs with relatively low transition temperatures for applications like surgical materials [1], actuators [2], smart fabrics, surface patterning and so on [3, 4], high temperature SMPs have great potential for applications requiring resistance to harsh conditions. Poly(vinylidene fluoride), PVDF- [5,6] and polysulfone-based (PSf) [7] copolymers were shown as physiological range responsive SMP. Herein, poly(tert-butyl acrylate), P(t-BA)-based [8] amphiphilic star-copolymers with thermally activated shape memory behavior were described. Atom transfer radical polymerization (ATRP) was applied to obtain shape memory amphiphilic polymers with hydrophobic core, P(t-BA) and hydrophilic shell (PEG and non-linear derivatives of PEG). Copolymers exhibited excellent shape memory properties around Tm of the soft segments and full recovery was achieved within seconds. These soluble and processable SMPs could potentially play an important role in biomedical applications.

Keywords: Shape Memory Polymer, Thermally Induced, Smart Materials, Amphiphilic Polymers

Acknowledgement: This work was supported by the Research Foundation of Istanbul Technical University (Project Grant Number: 41240).

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The Removal of Various Heavy Metal Ions via Adsorption by the Cross-linked Polycarboxylate-type Adsorbent

Ahmet Celil Sarı*
Master Student
Department of Chemical Engineering, Süleyman Demirel University, Turkey

Sıddıka Gamze Erzengin
Dr.
Department of Chemical Engineering, Suleyman Demirel University, Turkey

The rise of industrial production in last decades have created many types of wastes. The most important water pollutants in industrial wastes are heavy metals. These metal ions are toxic and carcinogenic for the living organisms and environment, even at low concentrations. Heavy metal ions are not biodegredable substances and cause hazardous pollution by accumulating in water resources and bodies of living things. Cadmium, copper, chromium, arsenic, zinc, lead, nickel and mercury can be adverted as the most common heavy metal pollutants in industrial wastewater. Methods of removing metals from industrial wastewater carry great importance, one of them is the adsorption that stands out with its cost-effectiveness, efficiency and simplicity of the method. In this study, the removal of Ni2+, Cu2+, Cd2+ and Zn2+ heavy metal ions from the aqueous solution by the cross-linked polycarboxylate-type adsorbent was investigated. Adsorbent synthesis was conducted by free-radical polymerization. The performance of the synthesized adsorbent in heavy metal removal was examined in terms of various parameters such as pH, temperature, time and initial metal concentration. Besides, the most suitable isotherm model for the adsorption process was determined, adsorption kinetics and thermodynamics were also investigated. The pre- and post-adsorption characterization of the adsorbent were performed with SEM and XRD. According to the research outcomes, cross-linked polycarboxylate-type adsorbent provided adequate removal of heavy metal ions at room temperature and pH 6. The examination of the equilibrium relationship between the adsorbate concentration in the liquid phase and that on the adsorbent surface and, the analysis of Langmuir and Freundlich adsorption isotherms showed that the adsorption process better fitted Freundlich equilibrium isotherm.

Keywords: Heavy Metal, Adsorption, Polycarboxylate, Cross-link

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V. International ISCMP TURKEY 2021
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Preparation Benzyl Isothiocyanate Loaded Chitosan Microspheres and Investigation of Antibiofilm Activities

Cagdas Deniz Periz*
Ph.D. Student
Department of Biology, Süleyman Demirel Univesity, Turkey

Seyhan Ulusoy
Prof.
Department of Biology, Süleyman Demirel Univesity, Turkey

ITCs are natural plant products with antibacterial, anticancer, and antioxidant properties. More than 120 different forms of ITCs have been discovered in plants, and benzyl isothiocyanate (BITC) is one of the most important bioactive components of ITCs, which may be isolated from harmless natural foods with antibacterial qualities like papaya fruit. In addition, BITC loaded chitosan microspheres' antibiofilm properties will be investigated in this study. Biocompatible chitosan as a copolymer can be easily converted into fibers, films, coatings, powders, and solutions as well as beads. In this study, *Pseudomonas aeruginosa* PA01 and *Staphylococcus aureus* ATCC 25923 strains were selected. These are opportunistic human pathogen that forms biofilm through the quorum-sensing system. Repressing biofilm formation will be a treatment approach that looks promising especially for immunocompromised patients. The ionic gelation method was used in the preparation of chitosan beads. Minimum inhibitory concentrations (MICs) were determined by broth dilution assay and biofilm formation was investigated in *P. aeruginosa* PA01 and S. aureus ATCC 25923 strains. In conclusion, MIC values for BITC were determined while as > 1mM in *S. aureus* and 2< in PA01. Also, it was observed that the BITC (by 0.25mM/mL) inhibited biofilm formation by 36% in *P. aeruginosa* PA01, and (by 0.25mM) inhibited biofilm formation by 51% in *S.aureus* respectively. At the end of this research, it was proved that BITC can be a significant anti-biofilm agent.

Keywords: Benzyl Isothiocyanate, Chitosan Microsphere, Antibacterial, Antibiofilm

Acknowledgement: This study is supported was financially supported by Project No: FDK-2020-8139 from the Research Foundation of Suleyman Demirel University, Isparta, Turkey, and by the YOK 100/2000 Scholarship.

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9461cc

The Effect of TiO_2 Thickness on Efficiency of FTO/TiO_2/P_3HT:PCBM/Ag Organic Solar Cells

Havva Elif Lapa*
Dr.
Department of Energy Systems Engineering, Isparta University of Applied Sciences, Turkey

Esra Şen
Phd. Student
Department of Bioengineering, Süleyman Demirel University, Turkey

Durmuş Ali Aldemir
Assoc. Prof.
Department of Physics, Süleyman Demirel University, Turkey

Murat Kaleli
Assoc. Prof.
Department of Physics, Süleyman Demirel University, Turkey

The effect of TiO_2 thickness (60, 90, 120 nm) on performance of FTO/TiO_2/P_3HT:PCBM/Ag organic solar cells (OSCs) was investigated. The cells were fabricated on both commercial fluorine-doped tin oxide (FTO) and FTO coated on glass by ultrasonic spray pyrolysis (USP) method. While the efficiency of OSCs fabricated on commercial FTO substrate was increased with increasing TiO_2 thickness, there was no trend for the USP deposited FTO substrates. The maximum efficiency of 0.51% was observed for the OSCs fabricated on commercial FTO with the TiO_2 thickness of 120 nm whereas the largest open circuit voltage was obtained for USP deposited FTO with the TiO_2 thickness of 90 nm.

Keywords: Organic Solar Cell, Organic Photovoltaic, TiO_2 Thickness

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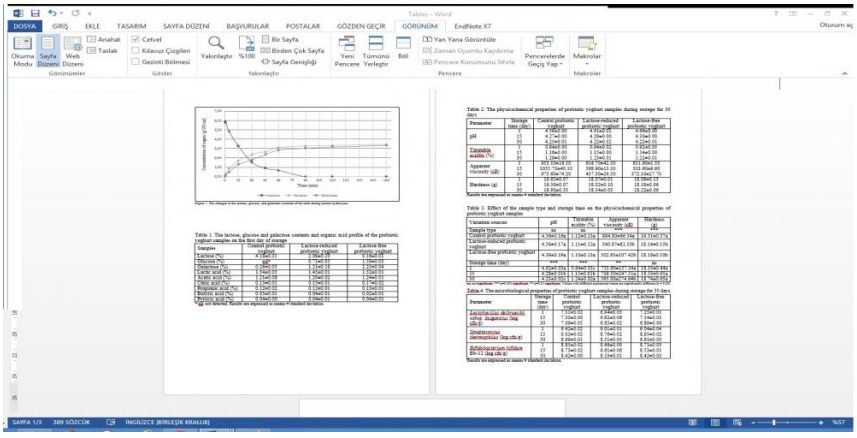
Effect of Lactose Hydrolysis on Physicochemical and Microbiological Properties of Probiotic Yoghurt

Firuze Ergin*
Dr.
Department of Food Engineering, Akdeniz University, Turkey

Ahmet Küçükçetin
Prof.
Department of Food Engineering, Akdeniz University, Turkey

Lactose, which is a natural disaccharide formed by glucose and galactose, is exclusively found in mammalian milk. Lactose is hydrolysed by enzymes named as lactase (β-galactosidase) and phlorizin hydrolase (glycosyl-N-acylsphingosine glucohydrolase) in the health human small intestine. Lactose intolerance can be caused by deficiency of β-galactosidase the brush-border of the small intestine and is defined as a clinical syndromecharacterised by abdominal pain, flatulence, diarrhoea, nausea, and bloating that can occur after lactose consumption. In recent years, the market for lactose-free or lactose-reduced dairy products has grown considerably. In this study, milk with 50% and 100% lactose hydrolysis by β-galactosidase was used for alternative lactose-reduced or lactose-free probiotic yoghurt. The control probiotic yoghurt samples were produced without added β-galactosidase. The pH and titratable acidity values of the probiotic yoghurt samples varied from 4.66 to 4.22 and from 0.92% to 1.27%, respectively, during the 30 days of storage. The apparent viscosity and hardness values of the probiotic yoghurt samples produced from lactose hydrolysed milks were lower than those of the control samples. The counts of *Bifidobacterium bifidum*, which was used as probiotic bacteria in this study, in the probiotic yoghurt samples produced from milk with 50% and 100% lactose hydrolysis and control samples ranged from 8.66 to 8.45 log cfu/g, 8.71 to 8.42 log cfu/g and 8.85 to 8.42 log cfu/g, respectively, during the storage period. The counts of *Streptococcus thermophilus* and *Lactobacillus delbrueckii* subsp. *bulgaricus* of the probiotic yoghurt samples produced from lactose hydrolysed milks were slightly lower than those of the control samples.

Keywords: Beta-galactosidase, Lactose, Probiotic Yoghurt,



1.Introduction

Lactose, which is a natural disaccharide formed by glucose and galactose, is exclusively found in mammalian milk. Lactose is hydrolysed by enzymes named as lactase (β-galactosidase) and phlorizin hydrolase (glyc osyl-N-

acylsphingosine glucohydrolase) in the health human small intestine. Lactose intolerance can be caused by deficiency of β-galactosidase the brush-border of the small intestine and is defined as a clinical syndrome characterised by abdominal pain, flatulence, diarrhoea, nausea, and bloating that can occur after lactose consumption. In recent years, the market for lactose-free or lactose-reduced dairy products has grown considerably (Schmidt, Mende, Jaros, & Rohm, 2016). In the present study, the effect of the lactose hydrolysis level on the physicochemical and microbiological of probiotic yoghurt was investigated.

2.Materials and Methods

For probiotic yoghurt production, raw cow milk was obtained from the Cattle Farm of Akdeniz University. The milk was standardized to approximately 15% total solids content. The total solids-standardized milk wasdivided into three parts. Two parts were heated to 37°C and treated with 0.1% (w/w) lactase enzyme (Maxilact LGI 5000, IMCD Co., Ltd., Istanbul, Turkey) obtain milks with approximately 50% and 100% hydrolysed lactose. The third part of milk without enzyme addition was used to produce control probiotic yoghurt samples. The milk samples with and without enzyme addition were heat-treated at 90°C for 10 min. and then cooled to 42°C. The cooled milks were inoculated with 0.2 g L-1 of yoghurt starter culture (CH-1 Yo-Flex, Peyma Chr. Hansen Inc., Istanbul, Turkey and with 0.5 g L-1 of Bifidobacterium bifidum Bb-12 (Peyma Chr. Hansen Inc., Istanbul, Turkey), then incubated at 42°C until pH reached 4.6. After that, the probiotic yoghurt samples were packed in 170 mL cups with lids and stored at 4°C for 30 days for physicochemical and microbiologicalanalyses. The percentage of titratable acidity and pH values of the control and enzyme-treated probiotic yoghurt samples were measured according to Erkaya, Baş lar, Ş engül, Ertugay, 2015. The pH values were determined using a pH-meter (Thermo Scientific Orion 2-Star, Bremen, Germany). Analysis of lactose, glucose, and galactose contents of the enzyme treated milk and probiotic yoghurt samples was performed by HPLC (Ultimate 3000, Thermo Fisher Scientific Inc. Waltham, Massachusetts, USA), which was equipped with aCARBOSep COREGEL-87P column (Transgenmic Inc., Nebraska, USA), refractive index detector (ERCrefractomax, Data Apex Ltd., Prague, Czech Republic) according to ISO/IDF (2007). Meanwhile, apparent viscosity and hardness values of the probiotic yoghurt samples were determined by using a Model DV II+Pro viscosimeter (Brookfield Engineering Laboratories Inc, Middleboro, MA, USA) and by using using a texturometer TA.XT Plus Texture Analyser (Stable Microsystems, Godalming, Surrey, UK), respectively. For the microbiological analysis, Ringer solution (1/4 strength) was used for the preparations of the dilutions. Lactobacillus delbrueckii subsp. bulgaricus enumerations were carried out on MRS Agar (pH 5.2) (Merck KGaA, Da rmstadt, Germany). MRS plates were incubated at 37°C under anaerobic conditions for 72 hours. Streptococcus thermophilus counts were performed on M17 agar (Merck KGaA, Darmstadt, Germany) containing 1% (w/w) lactose at an incubation temperature of 37°C under aerobic conditions for 48 hours (ISO/IDF, 2003). Bifidobacterium bifidum Bb-12 enumerations were carried out on MRS Agar (Merck KGaA, Darmstadt, Germany) with lithium chloride and sodium propionate. MRS plates were incubated at 37°C under anaerobic conditions for 72 hours (Fachin 2008). All experiments were performed in duplicate. The data were analysed using SAS Statistical Software (release for Windows, SAS Institute Inc., Cary, NC, USA). Duncan's multiple range test was conducted to detect differences between the treatment means.

3.Result and Discussion

The changes in the lactose, glucose, and galactose contents of the milk during lactose hydrolyses were shown in Figure 1. The 50% and 100% of lactose in the milk were converted glucose and galactose after 15- and 90-min treatment of lactase, respectively. The lactose content of the samples decreased, whereas the glucose and galactose contents increased with increasing lactose hydrolysis level. The content of galactose was higher than

the content of glucose in all probiotic yoghurt samples. It can be attributed that the galactose is not or poorly metabolized by yoghurt bacteria and probiotic bacteria (Amoroso, Nadra, De, & Oliver, 1989). The organic acid profile was found to be similar in all probiotic yoghurt samples (Table 1). The pH values decreased, and the titratable acidity values increased, with an increase in the storage period. The highest apparent viscosity and hardness values were determined in the control samples. The apparent viscosity and hardness values of the probiotic yoghurt samples decreased due to acid production and proteolysis activity of yoghurt bacteria and probiotic bacteria during the storage period (Table 2). Schmidt et al. (2016) reported that the exopolysaccharide (EPS) content of yoghurts produced from milk treated with lactase enzyme had higher than that of yoghurts produced from milk untreated with lactase, which might cause differences in the apparent viscosity values of the yoghurt samples. Ozdemir and Kilic (2004) showed that EPS prevents protein-protein interactions and lead a poor protein network in yogurt samples. Table 3, the statistical results clearly indicated that there was no difference between the pH and titratable acidity values of probiotic yoghurt samples. There was no significant difference between the apparent viscosity and hardness values of lactose-reduced probiotic yoghurt and lactose-free probiotic yoghurt. The counts of L. delbrueckii subsp. bulgaricus, S. thermophilus and B. Bifidum Bb-12 were found to be similar in all probiotic yoghurt samples, while the counts of these bacteria in the samples slightly decreased during the storage period (Table 4). All probiotic yoghurt samples showed viable cell counts of B. bifidum Bb-12 above 8.4 log cfu/g throughout the storage, indicating that the lactose-reduced and lactose-free yoghurt samples provided a suitable environment for the survival of this probiotic bacteria.

4.Conclusion

The lactose-reduced and lactose-free probiotic yoghurt samples had lower apparent viscosity values than control samples. In the future, it is necessary to carry out studies to increase the apparent viscosity values of probiotic yoghurt produced using the lactase enzyme. Moreover, the results of this investigation show that it is possible to produce lactose-reduced and lactose-free yoghurt with probiotic bacteria.

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V. International ISCMP TURKEY 2021
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Determination of Heavy Metals in Several Dairy Products (Yoghurt, Cheese and Cream) from Kosovo

Mentor Ismaili*
Ph.D. Student
Department of Food Technology, Faculty of Biotechnical Sciences, St. Kliment Ohridski - Bitola, Macedonia

Avni Berisha
Assoc. Prof.
Department of Chemsitry, University Of Prishtina, Kosovo

Dzulijana Tomovska
Prof.
Dept. of Food Technology, Faculty of Biotechnical Sciences, University St. Kliment Ohridski - Bitola , Macedonia

To be safe for consumption, dairy products (yoghurt, cheese, and cream) must be free of pollutants. (Hg) and (Cd) are found in water, feed additives, medications, and farm equipment. Milk and dairy contamination can affect food quality and safety. This study examines heavy metal in, cheese, and yogurt samples from Kastriot traditional farmers. Prior to analysis, samples were prepared using microwave digestion. was used to analyse heavy metals. To be safe for eating, dairy products must be free of pollutants. The statistical methods (Factor & Cluster analysis) were used to correlate and better understand the prevalence of these metals.

Keywords: Mercury, Cadmium , Cream, Kastriot (Obiliq), ICP-AES , Contamination

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Using Biosensors in Determination of Meat Quality

Orhan Özünlü*
Ph.D. Student
Department of Food Engineering, Pamukkale University, Turkey

Ramazan Gökçe
Prof.
Department of Food Engineering, Pamukkale University, Turkey

Haluk Ergezer
Assoc. Prof.
Department of Food Engineering, Pamukkale University, Turkey

Microbial spoilage of meat and meat products occur when microbes on or in the product negatively influence on the meat and meat products quality. The spoilage condition may vary depending on the types of microorganisms (bacteria, yeast and molds), which are affected by intrinsic (pH, water activity, nutrient contents, etc.) and extrinsic (temperature, relative humidity, air velocity etc.) factors. Currently, the expiration date of meat and meat products are determined by either subjective sensory (color, odor, texture etc.) and microbiological analysis (especially pathogen microorganisms). Also, several technologies (biosensors, indicators, electronic noses, gas sensors etc.) have been used to determine meat quality and freshness, which are important factors affecting consumers' sensory evaluation and their decision to purchase. These methods are used to analyze meat freshness to ensure that the meat is high quality and safe. Generally, the detection techniques address meat freshness issues by identifying certain substances such as volatile organic compounds, biogenic amines, trimethyl amines, volatile amines, hypoxanthine, xanthine etc. This review summarizes the extensive literature search on the using biosensors in meat and meat products.

Keywords: Meat Quality, Biosensor, Spoilage

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Preparation, Characterization and Thermal Energy Storage Properties of Microcapsulated Phase Change Material for Seafood Cold Storage

Tuğba Güngör Ertuğral*
Assoc. Prof.
Faculty of Çanakkale Applied Sciences, Çanakkale Onsekiz Mart University, Turkey

Merve Danışman
Ph.D. Student
Bayramiç Vocational School, Çanakkale Onsekiz Mart University, Turkey

Ayhan Oral
Prof.
Faculty of Arts and Sciences, Çanakkale Onsekiz Mart University, Turkey

Cold storage is the healthiest food preservation method, but is provided with expensive and non-environmental petroleum-derived fuels or electrical energy. Seafood storage temperature is 0-2 °C and they are the most sensitive products in food. Temperature fluctuations in currently used packaging materials (styrofoam, plastic crate, etc.). Ice used for cold storage slows bacterial and enzymatic changes, but temperature fluctuations in ice glue them together and that weight crushes the fish. Microcapsule packaging materials are important in terms of environmental friendliness, light weight, cost of food logistics. Containing phase material replacement (PCM) microcapsules save energy by storing storage heat, and this comfort can extend shelf life of food by preventing temperature fluctuations. In this study, capacity of predetermined eutectic paraffin-based Poly(methyl methacrylate) (PMMA) PCM materials to store heat energy in aquaculture storage temperature range was measured and prepared as microcapsules and their characterization; Fourier transform infrared spectroscopy (FT-IR), microcapsule calorimetry (DSC) characterized by differential scanning, thermogravimetric analyzer (TGA), scanning electron microscope (SEM) were performed.

Keywords: Thermal energy storage, Seafood, Phase Change Material, Microcapsul, Pmma,

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Transition Metal Doping Effects on the Impedance of Zn-Related Electrolytic Materials

Tayyar Güngör*
Prof.
Department of Energy Systems Engineering,
Burdur Mehmet Akif Ersoy University, Turkey

Ebru Güngör
Assoc. Prof.
Department of Energy Systems Engineering,
Burdur Mehmet Akif Ersoy University, Turkey

The frequency-dependent electrical properties of the Zn-related electrolytic materials with transition metal salts such as copper, cobalt, and nickel were examined. Impedance spectra of these solutions were analyzed using the electrical equivalent circuit approach (EEC) in the range of 50 Hz to 5 MHz. It was observed that the impedance plots were depressed semicircular arcs having their centers in the high-frequency region and a linear behavior in the low-frequency region. It was found that in all of the solutions, the optimal version of an EEC was a series combination of solution resistor (Rsol) and a module. The module was a series combination of a charge transfer resistor (Rct) and a constant phase element (CPE) connected in parallel to a double layer capacitor (Cdl). The exponential term was 0.78 for ZnO, 0.81 for copper salt, 0.84 for cobalt salt, and 0.87 for nickel salt contained Zn related electrolytic materials. A decrease in Rsol value and an increase in Rct values were observed with Cu, Co, and Ni contents.

Keywords: Impedance, Transition Metals, Electrolytic Solution

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Investigation of Drug Release Properties of Streptomycin Sulfate-Loaded PMMA/PEO Fibers

Esin Eren*
Dr.
Chemistry Department, Süleyman Demirel University, Turkey

Neslihan Nohut Maşlakci
Dr.
Department of Pharmacy Services, Isparta University of Applied Sciences, Turkey

Kadınşah Nur Koçer
Mrs.
Chemistry Department, Süleyman Demirel University, Turkey

Halime ÇEvikbaş
Dr.
Department of Biology, Süleyman Demirel University, Turkey

Seyhan Ulusoy
Prof.
Department of Biology, Süleyman Demirel University, Turkey

Abdullah Biçer
Dr.
Chemistry Department, Akdeniz University, Turkey

Günseli Turgut Cin
Prof.
Chemistry Department, Akdeniz University, Turkey

Ayşegül Uygun Öksüz
Prof.
Chemistry Department, Süleyman Demirel University, Turkey

Electrospun fiber mats have been used for the delivery of hydrophilic/hydrophobic drugs in drug delivery systems because they offer various properties such as high surface area/volume ratio, high porosity and high efficiency.1,2 In this study, the electrospun fibers were prepared by electrospinning polyethylene oxide (PEO), polymethylmethacrylate (PMMA) blended bis-chalcone derivatives ((2E,6E)?2,6?bis[(thiophen?2?yl)methylene]cyclohexanone and ((2E,6E)?2,6?bis(4-nitrobenzylidene)cyclohexanone), and streptomycin sulfate as the model drug. The fiber samples were characterized by scanning electron microscopy-energy-dispersive X-ray spectroscopy (SEM-EDX), Fourier transform infrared spectroscopy (FT-IR), and Thermal gravimetric analysis (TGA). In vitro release of drug from the drug-loaded fibers was studied in simulated physiological conditions by ultraviolet-visible spectroscopy. Morphological analysis results revealed that the electrospun fibers prepared with the mixture of PMMA, PEO and ((2E,6E)?2,6?bis(4-nitrobenzylidene)cyclohexanone) with streptomycin sulfate had a more uniform, bead-free, and random morphology. According to the release studies, the highest amount of drug release was achieved for ((2E,6E)?2,6?bis(4-nitrobenzylidene)cyclohexanone) in the 240 minute period. These results showed that drug-loaded PMMA and PEO fiber mats can be used as drug delivery vehicles in drug delivery systems.

Keywords: PMMA, PEO, Drug Release, Fiber

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2d6cc4

Catalytic Poly(3,4-ethylenedioxythiophene):Polystyrene Sulfonate Motors As Anticancer Drug Carrier

Gozde Yurdabak Karaca*
Dr.
Bioengineering, Suleyman Demirel University, Turkey

Sezin Eren Demibuken
Ph.D. Student
Department of Biomedical Engineering, Bogazici University, Turkey

Hilmi Kaan Kaya
Master Student
Department of Chemistry, Hacettepe University, Turkey

Aysegul Uygun Oksuz
Prof.
Department of Chemistry, Suleyman Demirel University, Turkey

Bora Garipcan
Dr.
Department of Biomedical Engineering, Bogazici University, Turkey

Filiz Kuralay
Prof.
Department of Chemistry, Hacettepe University, Turkey

Chemically powered nano/micromotors acquire autonomous movement by converting chemical energy into kinetic energy (Serrà ve García-Torres, 2021; Yurdabak Karaca vd., 2021a). Recent advances in the field of self-propelled man-made nano/microscale motors have led to major advances in the power, efficiency, directionality, motion control, functionality, and versatility of such synthetic motors (Zarei ve Zarei, 2018; Yurdabak Karaca vd., 2021b). Therefore, nanomachinery holds great promise for performing different operations and important tasks such as drug delivery, sensing, cell separation, micro-modeling, nanosurgery and micromanipulation (Jiao vd., 2020). On taking this into account, in this study, poly(3,4-ethylenedioxythiophene) (PEDOT):polystyrene sulfonate (PSS)-based catalytic motors were synthesized electrochemically. These machines were also consisted of catalytic platinum (Pt) and magnetic nickel (Ni) layers in their composition. Use of the motors was presented for cargo, Epirubicin (a widely used anticancer drug) loading and delivery. The effect of hydrogen peroxide (H_2O_2) fuel on catalytic movement was optimized. Structural and electroactive properties of the conducting polymer-based motors were examined with scanning electron microscopy (SEM) and electrochemical impedance spectroscopy (EIS). After successful loading of the cargo, Epirubicin loaded motors were guided on MCF-7 cell line and their controlled release properties were investigated under an optical microscope with evaluation of near-infrared (NIR) light and pH dependence. Additionally, cytotoxicity studies were done.

Keywords: Catalytic Motors, Drug Carrier, Epirubicin, Release

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V. International ISCMP TURKEY 2021
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Structural and Thermal Analyses of Rigid Polyurethane Foams Containing Micron-sized Turkey Feather Powder

Mustafa Ismael Khaleel*
Master Student
Department of Chemistry, Abant Izzet Baysal University, Turkey

Uğur Soykan
Assoc. Prof.
Department of Chemistry, Bolu Abant Izzet Baysal University, Turkey

Sedat Cetin
Assoc. Prof.
Department of Chemistry, Bolu Abant Izzet Baysal University, Turkey

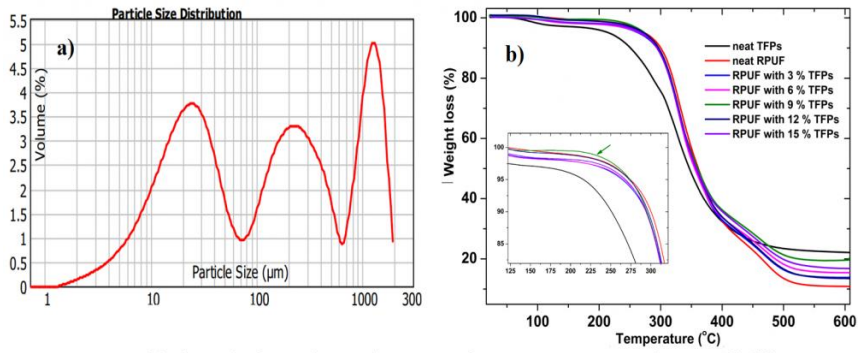

Fig. 1. *a)* particle size result of TFPs, *b)* TGA thermograms of pure TFPs, neat RPUF and RPUFs with different percantages of TFPs.

This study mainly focuses on not only the preparation of the rigid polyurethane foams (RPUFs) including different percentage (from 3 to 15 wt.%) of turkey feather powders (TFPs) but also the characterization of these resulting foams. TFPs were used as supplied directly from the company as grinded form. Free-rising (one-shut) method was utilized for the production of the foam composites. The structural evaluation of the samples was performed by means of ATR-FTIR and particle size analyzer, while thermal behavior investigation was conducted using DSC and TGA. The obtained results showed that the volume weighted mean value of TFPs was 382.11 µm and all the characteristic absorption bands belonging to both TFPs and RPUFs were observed in the FTIR spectra of the samples. Furthermore, the addition of TFPs into TPU matrix created the significant effect on the thermal behavior of the produced foams. Namely, according to DSC findings, all the foam samples depicted the exothermic degradation behavior in the temperature range from 340 °C to 385 °C, beyond which the exothermic degradation was observed. TGA analysis revealed that the neat TFPs started to degrade at about 84 °C Additionally, the temperature at which 1 % weight losses was observed for the foam species was found to be about 195 °C. Among foam samples, the foam including 9 % of TFPs showed better thermal stability. This probably was caused by the existence of more effective intermolecular interaction between functional groups presenting in both RPUF and TFPs at this content.

Keywords: Turkey Feather Powder, Rigid Polyurethane Foam, Particle Size, FTIR Analysis, Thermal Behavior

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Metronidazol Loaded Human Serum Albumin Nanoparticles Production and Characterization

Cansu Aydın
Master Student
Neuroscience Dept., Üsküdar University, Turkey

Öznur Özge Özcan*
Ph.D. Student
Molecular Neuroscience Dept., Üsküdar University, Turkey

Mesut Karahan
Assoc. Prof.
Biomedical Device Technology Dept., Üsküdar University, Turkey

Hatice Kübra Büyükbayraktar
Mrs.
Bioengineering Dept., Yıldız Teknik University, Turkey

Pelin Pelit Arayıcı
Dr.
Bioengineering Dept., Yıldız Teknik University, Turkey

The key role of protein-based nanoparticles has revolutionized the present technology. The development of drug delivery systems that use protein nanoparticles as carriers for drug molecules keeps on being a fast-growing field of study. In particular, the protein NPs present a number of advantages as drug carriers, which can be listed as their abundance in natural resources, biocompatibility, easy synthesis process, and cost effectiveness. Protein nanoparticles also have extraordinary biodegradability and non-antigenic properties. Moreover, they have attracted attention substantially as they have surface modification flexibility during drug addition. Natural biomolecules, like proteins, constitute an attractive alternative to synthetic polymers used widely in drug formulations, thanks to numerous advantages specified above. In particular, the fact that the Human Serum Albumin protein has a capacity of carrying drugs to a very large extent was considered highly attractive by scientists in their studies in view of the synthesis of drug-loaded nanoparticles. In this study, the objective was set to design the constitution of a drug carrying system against a specific disease (in bacterial infection treatments). LC, FT-IR Spectrophotometer, and ZetaSizer were used to scrutinize the nanoparticles. A Scanning Electron Microscope was used for morphological scrutiny. Nanoparticle (NPs) yield, encapsulation efficiency, and drug loading capacity were identified and *in vitro* release of the drug was pored over.

Keywords: Protein Nanoparticles, HSA, Metronidazol, Nanodrug, *In Vitro* Release,

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Methacrylated Gelatin (GELMA) and GELMA Hydrogel Synthesis and Characterization

Sabiha Demirci*
Ph.D. Student
Deparment of Chemistry, Muğla Sıtkı Koçman University, Turkey

Fatma Ayhan
Prof.
Deparment of Chemistry, Muğla Sıtkı Koçman University, Turkey

Hydrogels are used in many areas of biomedical applications such as drug delivery systems, contact lens, hygienic products, wound dressing, tissue engineering and scaffolding. Gelatin is the denatured product of collagen and amino acids in its structure contains mainly glycine, proline and hydroxyproline. It is also known as biocompatible, biodegradable, non-immunogenic and non-antigenic biomaterial and find use in tissue engineering applications due to natural extracellular matrix similarity, high water capacity and permeability such as 3-dimensional cell culture, tissue engineering and scaffold for supporting cell adhesion, growing and proliferation. Methacrylated gelatin (GELMA) hydrogels can be formed by crosslinking with redox reaction, termal or UV irradiation due to contains methacryloyl group. In this study, gelatin (Type A, 175 bloom) were used for GELMA synthesis. The chemical modification of gelatin was performed by methacrylic anhydride (MAA) in order to produce photocurable material, methacrylated gelatin. The degree of substitution of free amine groups via methacrylation of synthesized GELMA was determined with 2,4,6-trinitrobenzene sulfonic acid (TNBS) assay. GELMA hydrogel synthesis was achieved by photocuring and optimized for the amount of GELMA. GELMA and GELMA hydrogels were also characterized with SEM images and FTIR spectra for functional group analysis. The water uptake capacity and biodegradation characteristics of GELMA hydrogels were determined.

Keywords: Biomaterials, Gelatin, Gelatin Methacrylate, Hydrogel, Characterization,

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The Degradation Behaviors of an Amorphous and a Semicrystalline PLAs with Similar Molecular Weights under Different Temperature and Environmental Conditions

Sinan Atalay
Mr.
Metallurgical & Materials Engineering Department,
Istanbul Technical University, Turkey

Betül Bezci
Mrs.
Metallurgical & Materials Engineering Department,
Istanbul Technical University, Turkey

Burcu ÖZdemir
Ph.D. Student
Metallurgical & Materials Engineering Department,
Istanbul Technical University, Turkey

Yonca Alkan Göksu*
Dr.
Metallurgical & Materials Engineering Department,
Istanbul Technical University, Turkey

Mohammadreza Nofar
Assoc. Prof.
Metallurgical & Materials Engineering Department,
Istanbul Technical University, Turkey

Increase in the use of fossil-based commodity plastics have resulted in the accumulation of their wastes in the nature. These ecological concerns become a driving force to develop biodegradable polymers to replace the conventional petroleum-based counterparts. Poly (lactic acid) or polylactide (PLA) is a commercial biobased, biodegradable and compostable polymer that could be considered as a promising alternative. Lactic acid monomer has D- and L- isomers. When the D-lactic acid content increases beyond 8 mol%, PLA would turn to be a fully amorphous polymer. The degradation behaviors of an amorphous and a semicrystalline PLAs (i.e., aPLA and cPLA) having similar molecular weights are investigated under various humidity levels (atmospheric condition, 30% and 60%), different environmental conditions such as tap and sea water, regular garden soil and commercial grade microbial fertilizer with different durations (3 and 50 days) and temperatures (25, 60 and 80oC). After each treatment, the amount of degradation is determined by small amplitude oscillatory shear rheological experiments. When compared with aPLA, cPLA reveals a much less degradation under the aforementioned conditions due to its compacted crystalline structure that decelerates water and/or microorganisms? penetration. The degradation rates of both PLAs expedite with temperature increase, suggesting that PLA degradation could gradually occur in the environments with extreme warm weather. The increase in humidity also accelerates such degradation. When different environments are compared, commercial grade microbial fertilizer revealed to be most effective medium to degrade PLA due to the possible existence of both hydrolytic and enzymatic degradations. According to the DSC results of the treated PLA samples, while a slight decrease in PLA's Tg is observed, some degree of crystallinity could also be induced even in fully amorphous PLA subsequent to severe degradation. Those rheological and thermal findings are also supported with FTIR analysis.

Keywords: Polylactide, Degradation, Rheology, Crystallization

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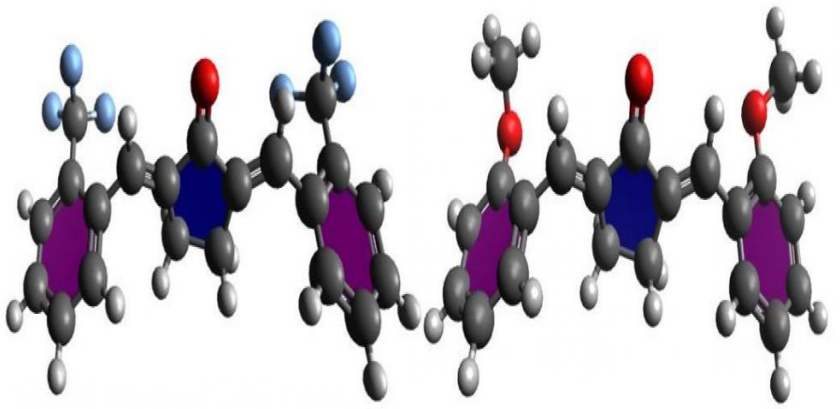
An Experimental and Theoretical Study of Methoxy and Triflouro 2,5-diarylidenecyclopentanone Derivatives

Veprim Thaçi*
Ph.D. Student
Institute of Chemistry, Ss. Cyril and Methodius University in Skopje, Macedonia

Ramiz Hoti
Prof.
Department of Chemistry, University of Prishtina, Kosovo

Avni Berisha
Prof.
Department of Chemistry, University of Prishtina, Kosovo

Jane Bogdanov
Prof.
Institute of Chemistry, Ss. Cyril and Methodius University in Skopje, Macedonia



Synthesis of two different molecules: 2,5-diarylidenecyclopentanone derivatives of: (2E, 5E) -2,5-Bis (2-triflourmethylbenzylidene) cyclopentanone and (2E, 5E) -2,5-Bis (2-methoxybenzylidene) cyclopentanone is the focus of this study. The characterization of the compounds was done by NMR, FTIR and UV-VIS spectroscopy. Moreover, theoretical calculations [using Molecular Mechanics (MM) calculations through the COMPASS II (Optimized Condensed Molecular Potential Potential) force for Atomistic Simulation Studies)], were performed for the conformational search for the studied molecules in order to sample the lowest energy conformations. The structures then underwent multiple annealing cycles (using Molecular Dynamics) and afterwards served as a starting point for DFT calculations. Time-dependent density-functional theory (TDFT) calculations were performed using Becke, with 3 parameters, functional Lee-Yang-Parr (B3LYP) and base 6-311 + g (d, p) set through Gaussian software 16. The solvent effect (CCl4 and CH2Cl2) was incorporated using the Polarizable Continuum Model (PCM) using the integral equation formalism variant (IEFPCM).

Keywords: Benzylidenecyclopentanone, Quantum Mechanics, NMR, Molecular Mechanics, DFT, UV-VIS

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Biochemical Basis of Metal Nanomaterial Synthesis Manufactured using Plant Extract with Sample of Silver Nanoparticle Synthesis

Havva Kaya*
Ph.D. Student
Department of Bioengineering, Suleyman Demirel Universty, Turkey

Semra Kilic
Prof.
Department of Biology, Suleyman Demirel University, Turkey

The increase in the usage area and amount of metal nanoparticles has led to the emergence of different approaches in production techniques. The biological methods included in these techniques offer a more ecological solution. Phytosynthesis is based on the use of plant extracts as biological agents. Water is generally used as a solvent and phytochemicals in the plant extract are used as reducing agents. Thanks to this, the release of pollutants that are used in large quantities is prevented and it provides great savings in energy use. In this method, each plant content is different and provides a different type of particle formation. Furthermore, plant selection, physical factors such as pH, temperature, reaction time, and light are important in stabilizing the morphological properties of nanoparticles. The disadvantage of the method is the difficulty in isolating the particles. This study focuses on the chemical basis of nanomaterial production by phyto nanosynthesis. This method, it is aimed to give an idea of the biochemical basis to be considered in the mass production processes of metal nanoparticles, which will be used in engineering fields other than bulk materials. As an example, silver nanoparticles (AgNP) was produced with lavender extract and characterization analyzes were performed with UV-Vis, SEM-EDS, and FTIR.

Keywords: Metal Nano Particles, Phyto nanosynthesis, Phytochemicals, Silver

Table 1: Volumetric ratios of samples prepared with Lavender Extract and $AgNO_3$ solution

	S1	S2	S3	S4	S5
$AgNO_3$	1X	2X	3X	1X	4x
Lavander extract	4X	3X	2X	1X	1x

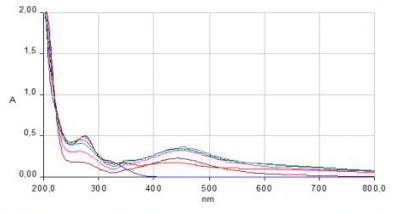

Figure 1: UV-Vis Spectra; Blue: Lavender extract, Red: S1, Green: S2, Pink: S3, Turquoise: S4 Brown: S5

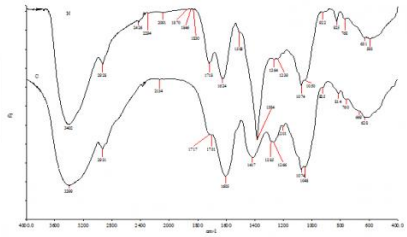

Figure 2: Fourier transform infra-red spectroscopy (F-TIR) absorbances N: Lavender extract - AgNp and C: Lavender extract

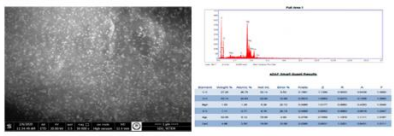

Figure 3: SEM and EDS images of AgNP in Lavender Extract

1.Introduction

Metal nanoparticles are used in a wide variety of fields, especially health, due to their anti-biological properties. In the production of metal nanomaterials, physical or chemical production techniques are used according to particle size, shape and hybridity. These methods have serious disadvantages compared to biological techniques. Energy consumption is high and dangerous chemicals are used. On the other hand, biological methods using microorganisms and plants are clean and low cost [1]. In phyto-synthesis, which is a sustainable

ecological method in biological production, the reduction of metal salts such as AgNO3, HAuCl4, CuCl2, FeSO4, PdCl2, K2PdCl6, graphene, graphene oxide, is based on plant extracts [2, 3]. Plant extracts contain amino acids, vitamins, alkaloids, terpenoids, sugars, flavonoids are phytochemicals that are effective in reducing metal [4]. Therefore applications such as antibacterial wound dressing material [5] and removal of textile dyes [6] of AgNP produced with plant extracts were carried out. In this paper, the production of AgNP using the extract of lavender, contains essential oils such as linalool, linalyl acetate, camphor [7], is exemplified, and the role of phytochemicals in reducing silver is explained.

2.Materials and Methods

Lavender extract was prepared using 200ml of deionized water and 2g of dried lavender flowers (Lavandula officinalis). The mixture was filtered using 0.2 µm Whatman® cellulose acetate membrane. 0.01 M AgNO3 solution was prepared with deionized water. The temperature of the mixture was measured as 19 0C and PH was 5,7. Lavender extracts and AgNO3 solution were mixed in the ratios in Table 1. It was left at room temperature for 24 hours to complete the reaction. Characterization of AgNP Surface plasmon resonance analysis for the optical characterization of AgNP was performed by UV-Vis spectroscopy. According to the Lambert-Beer law, the absorption must be below 2.0. For this reason, the mixtures were tested by diluting them at a ratio of 1/50. Since it is accepted that AgNP peak at 400-450 nm wavelength, spectrometric scanning was performed between 200 nm and 800 nm wavelengths. For SEM and EDS analysis, the mixtures were poured on the glass surface in a thin layer and dried in an oven at 50 0C. Similarly, for F-TIR characterization analysis of AgNP, the sample was left to dry on a glass surface in a sterile oven at 30 0C. After drying, the residues on the glass were scraped off for analysis. KBr pellet technique was used in the scanning process with FTIR spectrometer (4000- 400 cm-1) % transmittance.

3.Result and Discussion

UV-Vis surface plasmon resonance UV-Vis graphs made for surface plasmon resonance analysis in the characterization of AgNP. The best concentration was used for further optical characterization measurements. Absorption peaks between 400-450 nm indicate that the particle surface of the silver has increased. This indicates that the number of particles is increasing or their size is decreasing. No absorption was detected in the lavender extract tested as a control. On the other hand, the mixture amount with the highest AgNP resonance was determined as S4. Maximum AgNP was produced at 50% concentration (Fig 1). FTIR (Fourier transform infrared spectroscopy) The FTIR spectra of Lavandula officinalis leaf extract (C) and Lavender extract and AgNPs (N) are shown in Figure 2, respectively. The FTIR spectra show significant changes in N relative to C. 1050 -1074 cm-1 C ? O or C ? O ? C vibrations may belong to phenolics which are alcohol groups [8, 9]. The presence of the carbonyl group C = O is confirmed by the significant peak around 1718 cm-1. This peak, which was determined to increase in the spectrum of nanoparticles (N), maybe due to the presence of carbonyl group esters, which may be associated with a double bond or aromatic ring [10]. The peak observed at 2928 cm-1 is attributed to the -CH bonds of the alkyl groups, while the prominent band before 3600 cm-1 can be assigned to the -OH' line of phenolic compounds. For AgNP, the absorption at about 1384 cm-1 increased significantly as NO-3 was present in solution at N [11]. The FTIR spectrum (N) of the nanoparticles shows that the phytochemicals in the extract provide the reduction of AgNP. It also shows that the plant extract components prevent the metal nanoparticles from coming together and the nanoparticles remain stable in SEM pictures (Fig.3). The reason for this may be esters, acids, or essential oils, which are the main components of the plant extract containing carbonyl groups in the environment [12]. SEM (scanning electron microscope) and EDS (Energy Dispersion Spectrometer) The SEM image and EDS analysis result in Figure 3 are shown.

Nanoparticles are homogeneously dispersed among plant extract residues and stabilized to approximately the same size. Strong signals of silver atoms from nanoparticles were received in EDS. Other than that, weaker signals for carbon, oxygen, magnesium, and calcium are other organic ingredients found in Lavender extract.

4.Conclusion

The usage area and consumption amount of metal nanoparticles are increasing day by day. Production methods continue to diversify. Nanoparticle synthesis is more advantageous by reducing metal molecules in the form of salts, which are already ionic bonded, rather than converting pure metal into small particles. The main point in the reduction of salty compounds is related to the formation of aqueous solutions. Metal ions partially liberated in an aqueous solution require a salt-retaining agent for reduction. In nanoparticle synthesis, two basic processes are important after this stage. The first is to provide the electron source required to reduce the metal to X0 if possible, and the second is the physical and chemical process required for particle size stabilization. Phytonanosynthesis, a technique that has gained importance in recent years, offers an ecological solution to the production of metal nanoparticles with plant extracts. In this method, the chemicals contained in the herbal extracts meet the above-mentioned stages at the same time. However, the reduction and particle stabilization process is somewhat complicated due to the richness of the extract's content. This process can be explained in several ways. Phenolic compounds have hydroxyl and ketone groups that can bind to metals and show chelation [3]. These may be effective in the initial reduction of metals. Flavonoids and phenolic acids in plant extracts provide the formation of metal nanoparticles. During the complexion of metal salts with these substances, the metal is reduced. Subsequent fixation of the molecule may be achieved by oxidized polyphenols [13]. In addition, plant extracts may provide a great reduction in the energy required for the reduction of solutions of metal salts by suppressing oxidation reactions thanks to their antioxidant effect.

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V. International ISCMP TURKEY 2021
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Fabrication and Characterization of Mullite Reinforced TiO_2 Added ZrO_2 Ceramics

Mehmet Akif Hafızoğlu*
Ph.D. Student
Department of Mechanical Engineering, Sivas Cumhuriyet University, Turkey

Tahsin Boyraz
Assoc. Prof.
Metallurgical and Materials Engineering, Sivas Cumhuriyet University, Turkey

Ahmet Akkuş
Assoc. Prof.
Mechanical Engineering, Sivas Cumhuriyet University, Turkey

In this study, Mullite ($3Al_2O_3.2SiO_2$) and 8 mol % Titania added zirconia (8 mol % TiO_2 - 92 mol % ZrO_2) ceramic powders were synthesized by conventional ceramic production processing route. The mixtures were prepared by mechanical alloying method in acetone environment with zirconia ball mill. The powders were dried in oven at 110 ºC for 24 hours before mixing. Mullite ($3Al_2O_3.2SiO_2$) and 8 mol% Titania added zirconia (TiO_2-ZrO_2) ceramic powders were synthesized by reaction sintering from the powders made up of stoichiometric proportions of Al_2O_3, SiO_2, TiO_2 and ZrO_2 powders after being homogenized in acetone environment in ball mills. Mullite ($3Al_2O_3.2SiO_2$) and 8 mol% Titania added zirconia (TiO_2-ZrO_2) ceramic powders were synthesized in air at 1600 ºC for 3 h and 1300 ºC for 2 h, respectively. Then, the ceramic phases formed were made ready to form ceramic - ceramic composites by crushing, grinding and sieving processes. Then 0 and 10% by weight mullite (M) added Titania doped zirconia (TiZ) mixtures were prepared by powder metallurgy method. The prepared mixtures were wet milled with zirconia ball mill for 24 h and sieved. After drying, the powders were compacted to preforms of 56x12x10 mm by uniaxial pressing at 200 MPa. The green compacts were sintered at 1500-1600 ºC for 1-5 h in air conditions using a heating rate of 5 ºC min-1 in a high temperature furnace. Then, microstructure (SEM), phase analysis (XRD), mechanical (hardness, 3-point bending and wear) and physical properties (% shrinkage, water absorption, porosity and density) tests were performed on the mullite added titania doped zirconia ceramic composites. In this study, whether there is a phase change in the ZrO_2 - TiO_2 mixture at high sintering temperatures and the effect of mullite additive on the properties of this mixture was investigated.

Keywords: Zirconia, Mullite, Titania, Characterization, Ceramic, Wear

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V. International ISCMP TURKEY 2021
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Synthesis and Characterization of MASn(Ix, Br3-x) Perovskite Materials

Esra Şen*
Ph.D. Student
Department of Bioengineering, Süleyman Demirel University, Turkey

Havva Elif Lapa
Dr.
Department of Energy Systems Engineering, Isparta University of Applied Sciences, Turkey

Durmuş Ali Aldemir
Assoc. Prof.
Department of Physics, Süleyman Demirel University, Turkey

Murat Kaleli
Assoc. Prof.
Department of Physics, Süleyman Demirel University, Turkey

In recent years, hybrid (organic-inorganic) perovskite materials have been used extensively in electro-optical applications. The efficiency of solar cells depends on the production method, electron/hole transport layers, quality of interface in solar cells, type of perovskite compound, and crystallization rate. The chemical structure of perovskites is in the form of ABX3. For the materials used in perovskite solar cells, A: represents organic cation (methyl/ethyl ammonium/ formamidine), B: metal ion (Pb, Sn, Ge), and X: halogen anion (I, Br, Cl). In band-gap engineering, the structural and electro-optical properties can be changed by manipulating these groups in the perovskite structure. In this study, the synthesis of $MASnI_3$ material which can be manipulated to values close to the ideal (1.55 eV) bandgap was performed. $MASnI_3$, $MASnI_2Br$, $MASnIBr_2$, and $MASnBr_3$ perovskites were deposited by ultrasonic spray pyrolysis method after the MAI and MABr compounds were synthesized. Structural, elemental, and electro-optical analyses of the perovskites were studied with XRD, EDS, and Uv-VIS systems. It has been shown by UV-VIS measurements that the absorption spectra of perovskites can be tuned by changing I and Br ratios in the perovskite structure.

Keywords: Perovskite, Solar Cell, Bandgap Engineering, Synthesis

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b337e8

Investigation of Non-enzymatic Electrochemical Glucose Sensor Application of Prussian Blue-Based Flexible Thin Films

Elif Muslu*
Ph.D. Student
Department of Chemistry, Suleyman Demirel University, Turkey

Esin Eren
Dr.
Department of Chemistry and Department of Energy Technologies, Suleyman Demirel University, Turkey

Ayşegül Uygun Öksüz
Prof.
Department of Chemistry, Suleyman Demirel University, Turkey

The detection and quantitative determination of glucose, which is a monosaccharide group, is essential in many diverse fields such as health, food control and environmental protection. Hence, the simple, inexpensive and rapid detection of glucose concentrations is crucial in the current researches. Besides, the flexible thin-film glucose sensors have been studied because of their lighter weight, more comfortable and higher surface area capability, and characteristics to protect physical integrity under bending or folding and even stretching nowadays. Prussian blue (PB) is a dark blue pigment produced by the oxidation of iron ferrocyanide salts. It has been extensively utilised in sensor applications in recent years due to its electrochemical behaviour, chemically stable structure, and many features such as catalytic and electrochromic. In this study, PB-based thin films were deposited onto a conducting transparent indium tin oxide (ITO) coated with polyethylene terephthalate substrate via the electrochemical coating technique. These films were characterized by Scanning Electron Microscopy (SEM), Energy-Dispersive X-ray Spectroscopy (SEM-EDS), and Four-Probe Conductivity Measurement. Electrochemical features were evaluated using the Cyclic Voltammetry (CV) method. The reduction of current by glucose concentration changed was utilised to design a sensitive method for the quantification of glucose. In addition, the mechanical stability of these films on electrochemical performance was examined.

Keywords: Glucose Sensor, Non-enzymatic, Electrochemical, Prussian Blue, Flexible Thin Film,

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V. International ISCMP TURKEY 2021
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Antibiotic Release and Antibacterial Features of Polymer Coated Magnesium Microparticles

Yunus Emre Bulbul*
Ph.D. Student
Department of Chemistry, Suleyman Demirel University, Turkey

Gozde Yurdabak Karaca
Dr.
Department of Bioengineering, Suleyman Demirel University, Turkey

Gamze Celik Cogal
Dr.
Department of Chemistry, Suleyman Demirel University, Turkey

Halime Cevikbas
Dr.
Department of Biology, Suleyman Demirel University, Turkey

Seyhan Ulusoy
Prof.
Department of Biology, Suleyman Demirel University, Turkey

Aysegul Uygun Oksuz
Prof.
Department of Chemistry, Suleyman Demirel University, Turkey

Advances in biomaterials design principles and nanomaterials have led to tremendous progress in the development of effective nano/micro-sized particles/fibers with diverse functionalities in drug delivery systems as controlling the release profile [1-3]. In this study, we proposed a potential method for preparing magnesium-based drug delivery systems to have a controlled antibiotic release profile. A magnesium microparticle surface was modified with polyaniline (Mg/PANI), poly (lactic-co-glycolic acid) (Mg/PLGA), or poly (3-Aminophenylboronic acid) (Mg/PAPBA) according to chosen antibiotics. The resulting polymer-coated Mg surfaces were then loaded with Streptomycin (Mg/PANI-SM), amikacin (Mg/PLGA-Amk), or Ciprofloxacin (Mg/PAPBA-Cip). The morphological and physicochemical properties of the fabricated Mg-based drug delivery systems were characterized by Scanning electron microscopy/energy dispersive X?ray spectrometry (SEM/EDS) and Fourier transform infrared spectroscopy (FTIR). In vitro release from the antibiotics loaded Mg/polymer systems were examined under varying pH (5 and 7.4) by Quartz Crystal Microbalance and ultraviolet-visible spectroscopy. In addition, the antibacterial activity of fabricated drug delivery systems was evaluated on human pathogenic Gram-positive strains *Staphylococcus aureus* ATCC 25923, *Bacillus cereus* ATCC 11778, and Gram-negative strains *Pseudomonas aeruginosa* PAO1, *Escherichia coli* ATCC 25922.

Keywords: Drug Delivery Systems, Nanotechnology, Biomaterials, Magnesium, Microparticles, Antibiotics

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298f95

Synthesis and Characterization of Sulfonimide Substituted Polyphosphazene Polyelectrolytes

Ferda Hacıvelioğlu*
Prof.
Department of Chemistry, Gebze Technical University, Turkey

Elif Büşra Çelebi
Dr.
Department of Chemistry, Gebze Technical University, Turkey

Rumeysa Baran
Master Student
Department of Chemistry, Gebze Technical University, Turkey

Polymer electrolyte membrane fuel cells (PEMFC) are one of the most preferred clean energy conversion systems in areas such as electric vehicles and mobile technologies due to their high energy and power density. One of the most important materials of this type of fuel cells is proton conductive membranes [1]. Perfluorosulfonic acid (PFSA) membranes are used as standard materials for fuel cells due to their high mechanical, thermal and proton conductivity properties. However, PFSA membranes have some disadvantages such as high cost, high fuel permeability, and humidity dependent proton conductivity. Sulfonic acid functional polymers are a logical choice for PEM materials because strong acidity is required to provide high ionic conductivity and thermal stability. On the other hand, attractive alternatives to sulfonic acid containing materials are those containing sulfonimide groups. Although sulphonic acid functional polyphosphazenes have comparable properties to PFSA membranes, there is only one example of sulfonimide functional polyphosphazenes carrying sulfonimide groups in the literature [2]. Moreover, unlike the complex synthesis of sulfonic acid functional polyphosphazenes, sulfonimide functional polyphosphazene derivatives can be synthesized by direct sequential nucleophilic substitution reaction of the phenol reagent-bearing sulfonimide group with polydichlorophosphazene. In this study, 4-hydroxy-N-(phenyl sulfonyl)benzenesulfonimide reagent, which is required to impart hydrophilic character and high proton conductivity to the target polymers, was synthesized by following a high yield and a developed simpler synthetic approach [3]. Thus, a series of new proton-conducting polyphosphazene polymers were prepared by using 4-triflotomethylphenol groups as co-substituents in order to impart hydrophilic character to the target polymers. The structure of the obtained compounds was elucidated using spectroscopic methods. Thermal properties of TGA and temperature-dependent proton conductivity were investigated by impedance spectroscopy techniques.

Keywords: Polymer Electrolyte, Fuel Cell, Polyphosphazene, Sulfonimide

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V. International ISCMP TURKEY 2021
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Coating Method to Prevent Deformation Caused by Alcohol-Based Cleaning Materials on Artificial Leather

Deniz Teke
Ph.D. Student
Department of Chemistry, Selcuk University, Turkey

Busra Simsek*
Ph.D. Student
Department of Chemistry, Selcuk University, Turkey

Fatma Pinar Senkon
Ph.D. Student
Department of Chemistry, Selcuk University, Turkey

Arif Akillilar
Mr.
R&D , Tosunoğulları Mobilya San. ve Tic. A.Ş., Turkey

Mustafa Ozmen
Prof.
Department of Chemistry, Selcuk University, Turkey

Mustafa Ersoz
Prof.
Department of Chemistry, Selcuk University, Turkey

An outbreak of pneumonia of unknown origin was reported in Wuhan, China's Hubei Province, in December 2019. The global spread of SARS-CoV-2 and the thousands of deaths caused by the coronavirus disease (COVID-19) caused the World Health Organization to declare a pandemic on March 12, 2020 [1]. It is very important to interrupt the transmission chain of the virus with the appropriate disinfectant application, especially in cases such as a pandemic outbreak. It can be achieved in the community with hand hygiene, contact isolation and strict infection control tools. The success of the disinfectant depends on the use of effective disinfectants formulated in various types and forms, such as antimicrobial soaps, water-based or alcohol-based disinfectants. Disinfectants are chemical products that eliminate pathogens and prevent their development. By far, the most effective disinfectant products are alcohol-based formulations containing 62-95% alcohol, as they can denature the proteins of microbes and inactivate viruses [2]. Besides the positive effects of these formulations, the negative effects are among the topics that have been researched recently [3]. The use of disinfectants has reduced the risk of infection in different environments such as industry and home. However, due to the synthetic structure of disinfectants, besides being toxic to human health, they also have negative effects in the living area. It has been observed that chemical reactions such as oxidation occur on the surface areas where these products are applied. The most common example of this phenomenon is furniture covered with artificial leather. In this study, a new coating solution will be developed to prevent oxidation on artificial leather. It is planned that this solution to be made for protection purposes will be based on polyurethane and polyethylene wax.

Keywords: Alcohol-based Disinfectant, Polyurethane, Polyethylene Wax, Artificial Leather

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V. International ISCMP TURKEY 2021
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Integrated Modeling and Optimization of Out-of-Autoclave Processing of Carbon Prepreg Laminates

Fatih Eroglu
Master Student
Integrated Manufacturing Technologies Research and Application Center, Sabanci University, Turkey

Mine Sarcan
Master Student
Department of Materials Science and Engineering, Canakkale Onsekiz Mart University, Turkey

Volkan Eskizeybek*
Assoc. Prof.
Materials Science and Engineering, Çanakkale Onsekiz Mart University, Turkey

Mehmet Yıldız
Prof.
Integrated Manufacturing Technologies Research and Application Center, Sabancı University, Turkey

Hatice Sinem ŞAŞ
Dr.
Integrated Manufacturing Technologies Research and Application Center, Sabancı University, Turkey

Composite manufacturing for the aerospace industry requires advance and skillful manufacturing techniques. The autoclave manufacturing technique is well understood and widely used for the aerospace industry that aims to get as low as possible void content in cured parts with higher pressure and temperature profile. The allowable geometry of manufactured parts and operational cost limits Autoclave manufacturing techniques by fulfilling high mechanical performance. Alternatively, Out of Autoclave (OoA) techniques with the Vacuum Bag Only (VBO) method with right process conditions and prepreg system has the potential to displace expensive composite manufacturing challenges in the aerospace industry. Using the new generation of OoA production permitting VBO process systems aims at achieving performance and safety values comparable to those produced by autoclave processes through curing processes in conventional furnaces. This study deals with developing an integrated process in accordance with space and aerospace standards, using VBO prepreg systems including mathematical modeling, numerical analysis, multi-objective optimization of the VBO process and experimental verification of production methods for fiber reinforced composite materials. For this, systematically characterized prepreg properties were used as an input to the developed process model, including thermal conductivity and specific heat parameters. Following, the process optimization was carried out allowing the production of composite laminates containing less than 1% voids in the composite structure as required by aviation standards.

Keywords: Prepreg, Porosity, Process Modeling, Process Monitoring, Out of Autoclave Processing

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Coronavirus Disease 2019 and Biomaterials

Serpil Özbaş
Assist. Prof.
Faculty of Health Science, Süleyman Demirel University, Turkey

Halil Özbaş*
Assist. Prof.
Department of Medical Genetics, Süleyman Demirel University, Turkey

Abstract A new coronavirus named "Severe Acute Respiratory Syndrome-Coronavirus 2 (SARS-CoV-2)" cause "Coronavirus Disease 2019 (COVID-19)" in humans. That was declared an "international public health emergency" by the World Health Organization (WHO) on January 30, 2020. WHO has defined the COVID-19 outbreak as a global pandemic due to severity of the disease. By August 2021, the number of diagnosed cases reached 215 million and unfortunately the death toll exceeded 4.5 million. Significant progress has been seen in developing vaccine for this disease. Absence of a proven treatment and the inability to provide full immunity via the vaccine yet lead the whole world to new researches to eradicate this disease. The aim of this review is to emphasize the importance of biomaterials, which are among the new researches in the treatment of the disease. Biomaterials are obtained from natural or synthetic materials and the most commonly used are hydrogels, cryogels and nanoparticles. Biomaterials used for diagnostic or therapeutic purposes must be designed to function within biological systems. Hydrogels commonly used in tissue engineering tend to be hydrophilic and biocompatible. As a macro porous network, cryogels can be used for many biological applications, including tissue engineering and bioseparation. Like liposomes, NPs are important biomaterials in modern medicine; clinically, it can be used as a nano carrier for drug and gene delivery. In the fight against the global pandemic, the use of biomaterials can be an important savior in designing COVID-19 infection models, diagnosing the disease, improving existing drug delivery, developing new antiviral approaches, and enhancing vaccine efficacy. In this universal pandemic, global preparedness and scientific cooperation are imperative. Multidisciplinary strategies related biomaterials are expected to play an important role in COVID-19 disease detection and management.

Keywords: Covid-19, Biomaterials, Hydrogels, Cryogels

Introduction Coronaviruses (CoV) are a large family of viruses with many subtypes that can cause mild infections and more serious infections, such as Severe Acute Respiratory Syndrome, in animals and humans. SARS-CoV caused the death of hundreds of people 2003 as an international health emergency. About 10 years later, another member of the coronavirus family MERS-CoV, appeared for the first time in 2012. In December 2019, a cases of pneumonia with unknown etiology reported in the city of Wuhan, China. The agent was identified as a new coronavirus (2019- nCoV) that has not been detected in humans before, on January 7, 2020. Later, the name of the disease was accepted as COVID-19, and the virus was named SARS-CoV-2 due to its close resemblance to SARS CoV [1, 2, 3, 4]. The WHO classified the COVID-19 outbreak as an "international public health emergency" on January 30. After that defined as a global pandemic on March 11 due to the occurrence of COVID-19 cases in more than 100 countries and the spread and severity of the virus [4,5]. Although the increase and decrease in the number of daily cases and deaths continued during the pandemic, which has been going on for more than 20 months, the number of diagnosed cases by August 2021 reached 215 million and unfortunately the number of deaths exceeded 4.5 million. This indicates an urgent need for prevention and treatments for the disease [6]. SARS-CoV-2 enters cells through the binding of spike protein to the angiotensin converting enzyme 2 (ACE2) receptor [7]. Immune cells release cytokines to stimulate immune responses at the site of infection [8]. In SARS-CoV-2 infection, a dysregulated immune response can cause

hyper inflammation related cytokine storm and severe lung damage [9]. In cytokine storm increasing cytokines levels may also cause the multi-organ failure associated with septic shock [10]. Systemic inflammation occurring in SARS-CoV-2 infection may cause endothelial damage and coagulation disorder, leading to hyper coagulation and thrombosis [11]. In COVID-19 associated coagulopathy, levels of various coagulation markers, especially D-dimer increases [12]. Our knowledge of this new virus is constantly increasing, but still not enough. Currently, there is no definitive cure for COVID-19 that has been fully proven, and recovering from the disease is difficult for patient. There are significant progress in vaccine studies as a preventive measure, however long-term immunity can not be achieved yet [13]. A lot of research is being done to end the ongoing COVID-19 pandemic as soon as possible. In this review, it is pointed out that in addition to the ongoing studies, biomaterials may also have an important contribution to the prevention of pandemics. Lots of biomaterials have been investigated for use in fight of COVID-19. Biomaterials offer many possibilities for developing disease models, preventive like vaccines, and therapeutic measures. Biomaterials that are particularly relevant include hydrogels, cryogels, and nanoparticles (NPs) [14]. In addition, biomaterials are used in protective equipment such as protective clothing, goggles and masks, which are considered as important tools to prevent the spread of COVID-19 infection [15,16,17,18]. Different polymers including polyvinylidene fluoride (PVDF), polypropylene and polytetrafluoroethylene (PTFE) have been used in the manufacture of face masks and shields [19]. In the fight against coronavirus to evaluate efficacy of vaccines and treatment approaches, related tissue engineering studies and in vitro models can be used [20]. Among the various tissue engineering techniques, organoid engineering [21,22], 3D bioprinting [23,24,25], and organ-on-chip systems [26,27,28] are the most used approaches to design effective in vitro tissue models. [29]. Biological and chemical structurally defined biomaterials support the 3D maturation of related tissues [30]. In their study, R. Bhowmick et al modelled human lower airway epithelium by recreating an air-liquid interface in human airway epithelial cells cultured on chitosan-collagen scaffolds. This approach has been used to assess cytokine production following viral infection [31]. In a different study utilized collagen-hyaluronate scaffolds to support a 3D model of in vitro airway by co-culturing human lung fibroblasts and human epithelial cells [32]. Lots of antiviral drug have undesirable off-target toxicological effects. Biomaterial-based systems can be used to stabilize antiviral agents and reduce drug dose. At the same time, biomaterials can be used to provide better tissue targeting and limit off-target side effects. [33]. Ivermectin is an antiviral drug that reduces replication of SARS-CoV-2 [34]. For ivermectin, Poly-polyethylene glycol block copolymer NPs [35] and liposomes (Phosphatidylcholine-based) have been used as drug carriers. When ivermectin incorporated into phosphatidylcholine-based liposomes, exhibited antiviral activity in infected cells while low in vitro cytotoxicity in uninfected cells [36]. Although there are significant progress in the study on vaccines, the role of biomaterials in strengthening immune responses and especially their contribution to long-term immunity should not be neglected. Biomaterials can support and enhance effective immune responses when used appropriately. For this, it is expected that the biomaterial will be designed to stabilize antigen, regulate antigen presentation system, activate antigen presenting cells (APCs), and trigger recognition receptors pattern [37]. Individuals with suppressed or weakened immune systems and elderly individuals are most vulnerable to COVID-19, therefore low immunogenicity of vaccines is crucial [38]. Increasing the immunogenicity of the mRNA vaccine, diC14-amidine based liposomes were used [39]. These cationic liposomes effect positively the immunogenicity of vaccine important for immune activation [40]. Oxygen is under investigation that potent but insufficient co-adjuvant which has the potential to increase immu nogenicity of vaccine [41]. **Result and Conclusion** COVID-19 disease often causes dysregulation of immune responses, blood clotting, and tissue damage. Properly designed biomaterials can provide targeted drug delive ry, immunmodulation, and other desirable functions. Successful development of possible immunotherapy stra tegies and biomaterials approaches from the perspectives of preventive immunization, tissue healing andregene ration against the progression of SARS-CoV-2 infection and COVID-19 disease; have benefit broadapplications for various infectious diseases addition to COVİD-19. It is inevitable to carry out multidisciplinary

and international studies in order to be successful in the fight against COVID-19 disease.?

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V. International ISCMP TURKEY 2021
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Examining Pharmacodynamic and Pharmacokinetic Properties of L-HIPPO for HIV Treatment

Belgin Sever*
Assoc. Prof.
Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Anadolu University, Turkey

Halilibrahim Ciftci
Dr.
Medicinal and Biological Chemistry Science Farm Joint Research Laboratory, Faculty of Life Sciences, Kumamoto University, Japan

Hiroshi Tateishi
Dr.
Medicinal and Biological Chemistry Science Farm Joint Research Laboratory, Faculty of Life Sciences, Kumamoto University, Japan

Masami Otsuka
Prof.
Department of Drug Discovery, Science Farm Ltd., Japan

Mikako Fujita
Prof.
Medicinal and Biological Chemistry Science Farm Joint Research Laboratory, Faculty of Life Sciences, Kumamoto University, Japan

Hasan DeMirci
Dr.
Department of Molecular Biology and Genetics, Koc University, Turkey

One of the major challenges of fight against HIV is to eliminate the latent viral reservoir from body. This reservoir is resistant to antiretroviral therapy (ART) and leads to viral rebound once the treatment is stopped, giving rise to new rounds of infection. In order to eliminate the latent reservoir, beyond the goal of eradicating HIV, a new strategy "lock-in and apoptosis" has been suggested. In this strategy, a man-made analog of inositol hexaphosphate (IP6) named L-HIPPO has been developed to suppress membrane localization of Gag. Subsequently, it induces apoptosis of the host cell containing the un-budded viruses. MA domain of the Gag is the responsible part of the membrane binding through its interaction with inositol phospholipid PIP2 in the host membrane. It has been recently shown that PIP2 and IP6 have neighboring alternate binding sites within the same highly basic region (residues 18-33). Toward optimization of IP6 derivative, pharmacodynamic and pharmacokinetic properties of L-HIPPO using molecular docking simulation between different HIV-1 MA domains (PDB IDs: 2H3Q, 2H3Z and 2H3V) and L-HIPPO as ligand were examined and compared with IP6 and PIP2. According to the molecular docking results, L-HIPPO displayed high affinity forming key hydrogen bonds and salt bridge formations with Arg22, Arg76 and Lys27 and hydrogen bonds with Asn80 and Ser77 through its phosphatidyl groups in all MA domains. The best docking scores of L-HIPPO were obtained in the MA domain of 2H3Q. Some crucial pharmacokinetic properties such as conformation-independent aqueous solubility (CIQPlogS) and octanol/water partition coefficient (QPlogPo/w) of L-HIPPO and IP6 were in silico predicted. The results were found in acceptable range based on the specified parameters. Besides, crystallization of MA-L-HIPPO is still on trial. For further studies, in order to develop second generation of IP6 derivative for HIV treatment, the structural and computational analysis will be performed.

Keywords: HIV-1, MA protein, IP6, L-HIPPO, Molecular Docking, Drug Development

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Structure-Based Anti-HIV Drug Development

Halil I Ciftci*
Dr.
Medicinal and Biological Chemistry Science Farm
Joint Research Laboratory, School of Pharmacy,
Kumamoto University, Japan

AIDS caused by infection of HIV is a major global public health issue. Antiretroviral therapy (ART) using multiple anti-HIV drugs have been developed, and suppression of HIV replication in patients has become possible in recent decades. However, latent HIV reservoirs remain in certain cells in patients bodies. Once ART is quitted, it is highly likely that viral rebound from the reservoirs gives rise to new rounds of infection. The removal of the reservoir, that is HIV eradication, is urgently needed in HIV-AIDS studies. Our works recently suggested a new strategy called "lock-in and apoptosis". In development of this strategy, a novel synthetic derivative of IP6 named as L-HIPPO has been developed to suppress membrane localization of HIV-1 Gag protein (Pr55gag) and to induce strong apoptosis of the host cell containing the latent viruses. The L-HIPPO was designed based on the fact that the MA domain of Pr55gag which mediates membrane binding through its interaction with inositol phospholipid PIP2 in the host membrane. It's been shown that L-HIPPO has a MA-binding affinity 70-fold stronger than that of the less phosphorylated PIP2 derivative. Toward further development of IP6 derivative with higher affinity and specificity to MA, we have tried crystallization of HIV-1 Gag MA as the complex IP6. Three high-resolution crystal structures of the MA domain in complex with IP6 molecules was revealed at cryo-temperature (2.40 Å, and 2.72 Å resolution), and ambient-temperature (3.5 Å resolution) and computational biology identified the key residues that participate in IP6 binding. Our data confirmed that the IP6 molecules were interacted with residues in the highly basic region of HIV-1 gag matrix. Moreover, crystallization trial on the MA-L-HIPPO is in progress. The structural and computational analysis will be used for the development of L-HIPPO derivative to find a cure for HIV infection.

Keywords: X-ray Crystallography, HIV-1, Matrix Protein, Inositol Hexaphosphate, L-HIPPO, Drug Development

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V. International ISCMP TURKEY 2021
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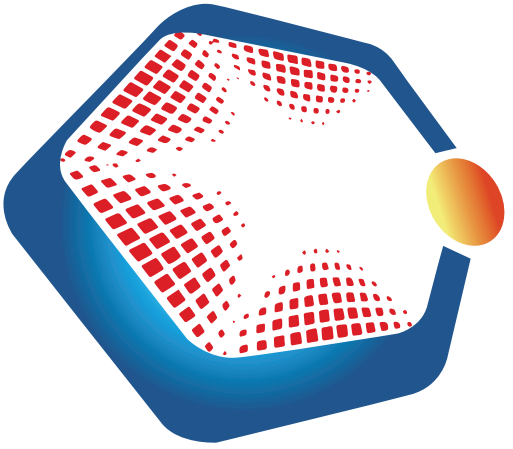
New Generation Vaccine Models

Mesut Karahan*
Assoc. Prof.
Biomedical Device Technology , Üsküdar University
Turkey

Conventional vaccine platforms have made many contributions to the eradication of smallpox and to protect against cancer. However, the conventional vaccines have certain limitations that make them less suitable for rapid vaccine production in a pandemic. In SARS-CoV-2 pandemic, large quantities of virus will need to be grown under biosafety level 3 (BSL3) conditions for a conventional vaccine to be produced by fully inactivated; extensive safety testing is required to ensure that live attenuated viruses are safe and do not easily revert to the wild/mutant type, and several recombinant proteins must be produced simultaneously for virus-like particle vaccines. The main advantage of next-generation vaccines is that can be developed based solely on sequence information. There are 4 structural proteins in SARS-CoV-2; spike (S) glycoprotein, membrane (M) protein, envelope (E) protein and nucleocapsid (N) protein. It is striking that the S protein is mostly used in subunit protein and peptide vaccines. In this study, immunogenic peptides were identified in silico methods based on the S protein of SARS-CoV-2, specifically the angiotensin converting enzyme 2 (ACE2) receptor binding site (RBD), where this protein binds to human cells to develop a domestic COVID-19 vaccine. In these analyzes, approximately 10 predictive peptides with a high percentage were selected, and the two high efficacy peptide sequences were identified by using the genome sequence of SARS-CoV-2. These peptide sequences were synthesized by the method of Solid Phase Peptide Synthesis. Peptide-based vaccines formulated with alum adjuvant and were analyzed toxicologically. Immune response capacity was determined by ELISA method on experimental animals. Thus, all preclinical steps of a peptide based COVID-19 vaccine development study have been comprehensively completed for our country. The peptide-based vaccine formulation will have potential for clinical trials.

Keywords: Peptide Based Vaccine, Covid-19, Sars-cov-2, Preclinical Experiment, Vaccine Development,



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Determination of Anticancer Effects of 1,3,4-oxadiazole Derivatives against Glioblastoma Multiforme

Belgin Sever*
Assoc. Prof.
Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Anadolu University, Turkey

Halilibrahim Ciftci
Dr.
Medicinal and Biological Chemistry Science Farm Joint Research Laboratory, Faculty of Life Sciences, Kumamoto University, Japan

Glioblastoma multiforme (GBM) is the most prevalent and aggressive primary malignant tumor in the central nervous system in adults. The exact mechanisms underlying in the development of GBM still remain unknown. A common approach for the treatment of GBM includes surgery, radiation therapy and chemotherapy. Among them, chemotherapy has an important role in struggling with GBM, though there is a poor drug delivery to the tumor field resulting limited therapeutic response. Thus, opportunities and challenges have focused on exploring more efficient treatments against GBM. 1,3,4-Oxadiazole stands out as an important pharmacophore due to its lipophilic nature affecting the transmembrane transport, its capacity to form hydrogen bonds in receptor site and thus, its diverse biological activity profile, including anticancer activity. In the current study, 1,3,4-oxadiazole derivatives (1-3) were evaluated for their anticancer effects on U251 GBM cell line using MTT assay. 2-[(5-((1H-Indol-3-yl)methyl)-1,3,4-oxadiazol-2-yl)thio]-N-(6-ethoxybenzothiazol-2-yl)acetamide (3) was identified as the most potent anticancer agent against U251 cell line with a IC50 value of 9.84 µM when compared with cisplatin (IC50= 8.41 µM). Compound 3 also showed cancer cell-selective action towards Jurkat cell line posing no toxicity on peripheral blood mononuclear cells (PBMCs). Moreover, this compound was found to cleave DNA in the presence of $FeSO_4$, H_2O_2 and ascorbic acid system. The results of molecular docking, which was carried out to detect the binding potential of compound 3 to DNA, indicated that compound 3 presented a key pi-pi stacking interaction with DG-16 in the minor groove of the double helix of DNA (PDB ID: 1BNA). In silico estimated Absorption, Distribution, Metabolism and Excretion (ADME) parameters of compound 3 were detected to be coherent with standard range making it as a potential orally bioavailable anticancer agent for future studies.

Keywords: 1,3,4-Oxadiazole, Glioblastoma multiforme, Cytotoxicity, DNA-cleavage, Molecular Docking, ADME

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Pyrazoline Derivatives as Anti-Glioma Agents

Halil I Ciftci*
Dr.
Medicinal and Biological Chemistry Science Farm Joint Research Laboratory, School of Pharmacy, Kumamoto University, Japan

Belgin Sever
Assoc. Prof.
Department of Pharmaceutical Chemistry , Faculty of Pharmacy, Anadolu University, Turkey

Gliomas are the most frequent and malignant form of human primary brain tumors and among them, glioblastoma multiforme (GBM) is the most common and aggressive type. It is characterized by rapid proliferation, diffuse infiltration into the brain and a poor prognosis, which affect therapeutic approaches including a combination of surgical resection, radiation, and chemotherapy. Therefore, there is an urgent need to discover the molecular alterations of GBM and so, to develop more efficient targeted therapies. Pyrazoline is a privileged heterocycle in drug discovery with its various possibilities for structural diversification and its wide spectrum of biological profile including anticancer activity. In the recent study, the cytotoxic effects of pyrazoline derivatives (1-3) were investigated against U251 glioma cell line using MTT assay. 1-(4-(4-Fluorophenyl)thiazol-2-yl)-3-(4-morpholinophenyl)-5-(4-chlorophenyl)-2-pyrazoline (1) exhibited the most significant anticancer activity with a IC50 value of 15.77 microM compared to cisplatin (IC50= 8.85 microM). Besides, compound 1 revealed no cytotoxicity against peripheral blood mononuclear cells (PBMCs). Compound 1 also presented DNA cleavage efficiency with FeSO4, H2O2 and ascorbic acid system. Molecular docking studies were conducted for compound 1 in the minor groove of the double helix of DNA (PDB ID: 1BNA). According to the results, compound 1 formed crucial pi-pi stacking interactions with DA-6, DA-17, DA-18 and DG-16. As permeability through the blood-brain barrier (BBB) is very substantial for glioma treatment, some important BBB-associated pharmacokinetic parameters of compound 1 were in silico predicted. Results pointed out that compound 1 could cross the BBB with a brain/blood partition coefficient (QPlogBB) value of 0.715. Moreover, this compound revealed central nervous system (CNS) activity on a +2 (active) scale.

Keywords: Pyrazoline, Glioma, DNA-Cleavage, Molecular Docking, Blood-Brain Barrier,

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V. International ISCMP TURKEY 2021
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Prepararion of Composite Nanoparticles Suitable for Magnetic Resonance Imaging

Emine Kutlu*
Mrs.
Department of Chemistry, Burdur Mehmet Akif Ersoy University, Turkey

Fatih Mehmet Emen
Prof.
Deparment of Chemistry, Burdur Mehmet Akif Ersoy University, Turkey

Hyperbranched polymers (HBPs) are 3D macro molecules with spherical or dendritic structures characterized with low viscosity, high solubility and facile synthesis (Zheng vd., 2015). HBPs contain many end groups and have multifunctional crosslinking possibilities. HBPs have been widely used as drug carriers, biomaterials, hybrid materials, composites, coatings, adhesives in supramolecular chemistry due to their thermal stability, chemical resistance and mechanical properties (Kavitha ve Priya Dasan, 2013). Recently HBPs have been preferred in targeted drug delivery systems (DDS). Their spherical structures with many end groups available for functionalization allowed efficient and effective entrapment of active agents such as drugs and render them suitable for both passive and active targeted drug delivery. In order for to prolong the time the time the dendritic polymers stay in circulation they are rendered hydrophilic by functionalizing their surfaces with poly(ethyleneglycol) (PEG). HBPs synthesized in core-shell structure allow encapsulation of the materials with magnetic property which in turn imaging of the active agent incorporated into the structure of the HBPs (Tüylek, 2017). The most common HBPs used in DDS are poly(ethyleneimine) (PEI), poly(amidoamine) (PAMAM), polyglycerol (PG) and Boltorn family (Kavand vd., 2020). In this study, the surface of BoltornTM H40 ?a member of the Boltorn family- is functionalized with PEG to form pegylated dendrimeric nanoparticles (DNp-PEG) and into this the synthesized metal oxide (MO) nanoparticles (Fe2O3, Gd2O3) were loaded to obtain (DNp-PEG-MO). Their structures were characterized via FT-IR, 1H-NMR and XRD techniques.

Keywords: Hyperbranch Polymers, Boltorn H40, Metal Oxides, MRI Imaging

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V. International ISCMP TURKEY 2021
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Synthesis and Characterization of Sulfonic Acis Substituted Polyphosphazene/PolyPyrrole Composites

Elif Büşra Çelebi*
Dr.
Department of Chemistry, Gebze Technical University, Turkey

Halil Duyar
Ph.D. Student
Department of Chemistry, Gebze Technical University, Turkey

Ferda Hacıvelioğlu
Prof.
Department of Chemistry, Gebze Technical University, Turkey

In recent years, intrinsically conducting polymers (ICPs) with conjugated double bonds have attracted much attention since the discovery of doped polyacetylene (PA) in 1977 [1]. A lot of interest is shown due to their diverse structures, special doping mechanism, flexibility and relatively high conductivity. These features make them more desirable than metals in certain applications. Among the various ICPs, polypyrrole (PPy) is especially promising in commercial applications because of its simple preparation, good environmental stability, and higher conductivity compared with many other conducting polymers. PPy has been found to have many potential applications in electrochromic windows, membrane separation, light-weight batteries, solid electrolytic capacitor and sensors, and so on [1]. However, an important draw back with synthetically conductive PPy is its limited mechanical strength, lack of chemical stability and is insoluble and infusible, which restricts its processing and applications in other fields. Therefore, much efforts are being made to improve solubility and processability of PPy by involving protonation with dopants. It is well known that the synthesis with different dopants influences the electrical and optical properties. This can be achieved by different sulfonic acids such as camphor sulfonic acid (CSA), dodecylbenzene sulfonic acid (DBSA) used as dopants. When these dopants introduced to the polymer matrix by the process of doping as counter-ion in the polymer strongly affects the conductivity, morphology and thermal stability of bulk PPy [2]. Among these different sulfonic acids, sulfonic acid substituted polyphosphazene (PSAP) doped conducting polymers having enhanced higher thermal stability and high resistivity against to chemical oxidation as well as the most attractive properties of the polyphosphazenes are the stability of the inorganic chain to oxidation, reduction, and photochemical, or thermal bond cleavage, provided appropriate selection of side groups are attached to phosphorus atom [3]. We prepared different composites and investigated their properties.

Keywords: Conducting Polymer, Polyphosphazene, Polypyrrole,

References: [1] R. Ansari (2006), Polypyrrole conducting electroactive polymers: synthesis and stability studies, E-J. Chem. 3 (13) 186-201. [2] Carrillo I, Sanchez de la Blanca E, Redondo MI, Garcia MV, Gonzalez-Tejera MJ, Fierro JLG, Enciso E (2012) Influence of dopant anions on properties of polypyrrole nano coated poly(styrene-co-methacrylic acid) particles. Synth Met 162:136-142 [3] H.R. Allcock, F.W. Lampe, J.E. Mark, E.D. Pearson 3rd, Contemporary Polymer Chemistry, 2003. New Jersey.

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6e2713

Preparation of Perfluorinated Sulfonic Acid Functional Proton Conducting Phosphazenes

Ferda Hacıvelioğlu*
Prof.
Depaertment of Chemistry, Gebze Technical University, Turkey

Elif Büşra Çelebi
Dr.
Department of Chemistry, Gebze Technical Unviersity, Turkey

The introduction of acid functionality to polyphosphazenes makes them competitors of many ionomers for use in organic electronics and especially perfluorosulfonic acid membranes (PFSA), which are widely used in polymer electrolyte membrane fuel cells (PEMFCs) [1]. Nevertheless, there was a synthetic challenge to prepare and control the acid functionality on polyphosphazenes [1,2]. A simple nucleophilic displacement reaction of an acid-containing alkoxy, aryloxy, or amine reagent with halophosphazenes can give a mixture of the products and/or crosslinked derivatives. Therefore, protection of the acid functionality and de-protection after the nucleophilic displacement reaction is the safest method to prepare acid functional phosphazenes[2]. In this study, we used our previously developed method [1] to bring the sulfonic acid functionality onto the polyphosphazene main chain and 4-trifluoromethylphenol was used as a co-substituent. Hence, we prepared different compositions of poly(4-oxybenzenesulfonic acid)(4-trifluoromethylphenoxy)phosphazene copolymers in which the degree of sulfonation was successfully controlled to provide a balance between the hydrophobic and hydrophilic property of the final membrane. Thermal properties of the synthesized materials have been investigated by DSC, TGA and the ion exchange properties were measured using volumetric titrations. Impedance spectroscopy was used to investigate the proton conductivity properties of the perfluorinated sulfonic acid functional polymeric phosphazenes at various temperatures. It was found that the proton conductivity increases with increasing sulfonation degree and it was higher than that of Nafion under anhydrous conditions.

Keywords: Polyelectrolyte, Phosphazenes, Pem Fuel Cell,

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References: 1 E. B. Çelebi, F. Hacıvelioğlu, Polymer Chemistry, 2017, 8, 3022. https://doi.org/10.1039/C7PY00189D 2 H. R. Allcock, C. Chen, J Org Chem, 2020, 85, 14286. https://doi.org/10.1021/acs.joc.0c01710

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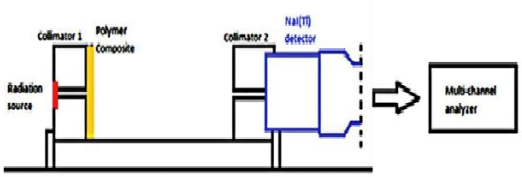
Radiation Shielding of Styrene-Based Unsaturated Polyester-Tungsten(VI) Oxide Composites

Berna Körpınar*
Ph.D. Student
Department of Chemistry , Manisa Celal Bayar University/Ege University, Turkey

Buket Canbaz Öztütk
Dr.
Department of Physics, Ege University, Turkey

Hakan Akat
Assoc. Prof.
Department of Chemistry, Ege University, Turkey

Nebiye Füsun Çam
Prof.
Department of Physics, Ege University, Turkey



In this study, radiation shielding properties of composites obtained using different ratios of tungsten(VI) oxide unsaturated polyester were investigated. Composites were prepared using $WO_3.2H_2O$ in different ratios (10%, 20%, 30%, 40%, and 50%.), and based on Styrene unsaturated polyester were used as resins. The linear attenuation coefficients of the composites were measured by the NaI(Tl) gamma spectrometry system. The Attenuation coefficients were also measurement theoretically by the XCOM platform, taking into consideration the basic analysis of composites and comparing them with empirical outcomes. According to the results of XRD and particle sizer analysis, $WO_3.2H_2O$ demonstrated had obvious diffraction peaks and its pore size distribution values were good. It was clear that the best shielding material in the studied composites was Stiren-based unsaturated polyester +50% $WO_3.2H_2O$ with a higher linear attenuation coefficient.

Keywords: Stiren-Based Unsaturated Polyester, $WO_3.2H_2O$, Polymer Composites, Gamma Ray Linear Attenuation, Gamma Ray Mass Attenuation, NaI(Tl) Scintillation Dedector

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Compatibility Studies of Tetracycline with Different Excipients by Using DSC and FTIR

Hale Seçilmis Canbay*
Assoc. Prof.
Department of Chemistry, Burdur Mehmet Akif Ersoy University, Turkey

Mahmut Doğantürk
Ph.D. Student
Scientific and Technology Research and Application Center, Burdur Mehmet Akif Ersoy University, Turkey

Fulya Taşcı
Assoc. Prof.
Department of Food Hygiene and Technology, Faculty of Veterinary Medicine, Burdur Mehmet Akif Ersoy University, Turkey

Tetracyclines are structurally different broad-spectrum antibiotics that generally act by inhibiting protein synthesis in microbes. They are widely used in various microbial infections [1-3]. Tetracyclines are given to animals intended for human consumption not only to prevent and treat certain diseases but also to stimulate growth. Study of drug?excipient interactions is a crucial step in preformulation stage of drug development to achieve consistent physical, chemical, bioavailability, stability, and manufacturability of the dosage form. In pre-formulation studies, it is important to use thermoanalytical (thermogravimetric analysis (TGA), differential scanning calorimetry (DSC), etc.) and spectroscopic (infrared spectroscopy (FTIR), etc.) methods. These are important systems for achieving a suitable formulation. In the present study, the possible interactions between tetracycline and excipients have been evaluated. For this purpose, DSC and FTIR measurements were carried out on each of the components, both in the pure form, in some of the corresponding solid binary mixtures tetracycline/excipient. Methods A DSC was used for the thermal analysis of the drug and mixtures of the drug and the excipients in a 1:1 w/w ratio. Individual samples of the tetracycline and excipients. Frontier spectrometer was used. Tetracycline and excipient (1:1 ratio, w/w) mixture can be placed directly into the path of the infrared beam and 128 scans were collected with a resolution of 4 cm^{-1} for each measurement over the spectral range of 400-4000 cm^{-1}. Results and Discussion FT-IR spectrum of control sample showed thea bsorption peaks for N-H and O-H stretching at 3364-3310 cm^{-1} and aromatic C-H stretching at 3059-2990 cm^{-1}. FTIR spectrum of of the active drug-excipient physical mixture retained all the characteristic peaks of tetracycline. In the DSC curve of tetracycline hydrochloride, the sharp peak at 235.41 °C indicates oxidation. Similar peak was observed for the other active drug-excipient physical mixtures [4].

Keywords: Tetracycline, Excipient, DSC, TGA

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New Imidazothiazole-Hydrazone Hybrids as Potent EGFR-Targeted Anticancer Agents

Mehlika Dilek Altıntop*
Prof.
Department of Pharmaceutical Chemistry, Anadolu University Faculty of Pharmacy, Turkey

Belgin Sever
Assoc. Prof.
Department of Pharmaceutical Chemistry , Anadolu University Faculty of Pharmacy , Turkey

Halil I Ciftci
Dr.
Medicinal and Biological Chemistry Science Farm Joint Research Laboratory, Kumamoto University Faculty of Life Sciences, Japan

Hiroshi Tateishi
Dr.
Medicinal and Biological Chemistry Science Farm Joint Research Laboratory, Kumamoto University Faculty of Life Sciences, Japan

Masami Otsuka
Prof.
Medicinal and Biological Chemistry Science Farm Joint Research Laboratory, Kumamoto University Faculty of Life Sciences, Japan

Mikako Fujita
Prof.
Medicinal and Biological Chemistry Science Farm Joint Research Laboratory, Kumamoto University Faculty of Life Sciences, Japan

Ahmet Özdemir
Prof.
Department of Pharmaceutical Chemistry, Anadolu University Faculty of Pharmacy, Turkey

Non-small cell lung cancer (NSCLC), which is the most common lung cancer type accounting for almost 85% of lung cases, is the leading cause of cancer-related mortality across the globe. During the early stages, NSCLC is frequently asymptomatic and therefore most NSCLC cases are diagnosed at advanced or metastatic stages (stage III/IV) when the prognosis is poor and therapeutic options are limited [1]. The discovery of epidermal growth factor receptor (EGFR) activating mutations in NSCLC and the success story of EGFR tyrosine kinase inhibitors (TKIs) have changed the paradigm of cancer therapy from traditional cytotoxic chemotherapy to targeted therapies. As a result, EGFR TKI therapy, including erlotinib, gefitinib, and afatinib, has become the standard therapy for NSCLC patients with EGFR activating mutation as a first-line therapy [2]. Due to the importance of imidazo[2,1-b]thiazoles and their analogues in anticancer drug discovery [3], new imidazothiazole-hydrazone hybrids (1-10) were synthesized and screened for their cytotoxic effects on A549 human lung adenocarcinoma cells and peripheral blood mononuclear cells (PBMCs) using MTT assay. Among these compounds, 2-[6-(4-cyanophenyl)imidazo[2,1-b]thiazol-3-yl]-N'-[4-(dimethylamino)benzylidene]acetohydrazide (10) showed more potent anticancer activity with an IC50 value of 3.22 µM against A549 cell line than erlotinib (IC50= 21.92 µM) without any cytotoxicity towards PBMCs (IC50>100 µM). Compound 10 was also evaluated for inhibitory activity towards EGFR. The results showed that compound 10 exhibited EGFR inhibitory activity with an IC50 value of 10.66 µM. The in vitro data pointed out the importance of the introduction of the dimethylamino substituent into the position 4 of the benzylidene moiety for anti-NSCLC activity as well as EGFR inhibitory potency. The in vitro assay related to the apoptotic effect of compound 10 on A549 cell line is in progress.

Keywords: Non-Small Cell Lung Cancer , Epidermal Growth Factor Receptor, Anticancer Drug Discovery, EGFR- Targeted Anticancer Agents , Receptor Tyrosine Kinases, Imidazothiazole-Hydrazone Hybrids

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248e84

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Synthesis of N-Substituted Quinones and Impact of These Derivatives on The Clinically Important Pathogen Responses

Nahide Gülşah Deniz*
Assoc. Prof.
Department of Chemistry, Istanbul Universtiy-Cerrahpasa, Turkey

Ayşegül İşcan
Master Student
Department of Chemistry, Istanbul University-Cerrahpasa, Turkey

Çiğdem Sayıl
Prof.
Department of Chemistry, Istanbul University-Cerrahpasa, Turkey

Aslı Baysal
Prof.
Health Services Vocational School of Higher Education, Istanbul Aydin University, Turkey

Hasan Saygın
Prof.
Application and Research Center for Advanced Studies, Istanbul Aydin University, Turkey

Sevilay Zora
Ph.D. Student
Health Services Vocational School of Higher Education, Istanbul Aydin University, Turkey

Quinone molecules are biologically active, useful compounds which can be occured both naturally and synthetically. They take charge in photoysnthesis reactions as electron carriers. Also, quinones play a role as vitamins in the treatment of some cardiovascular illnesses. By means of their antioxidant activity, quinone molecules are used in many drugs in pharmacology and they increase general health conditions [1]. Quinones are highly redox active molecules which can redox cycle with their semiquinone radicals which leads to the formation of reactive oxygen species (ROS), including superoxide, hydrogen peroxide, and ultimately the hydroxyl radical. Through the formation of oxidized cellular macromolecules such as; lipids, proteins, and DNA, the production of ROS may cause oxidative stress within cells [2-3]. In this study, three N-substituted-1,4-naphtoquinone compounds were synthesized from the reactions of 2,3-dichloro-1,4-naphthoquinone with different nucleophilic compounds proceed by Michael addition and substitution reaction under the aerobic conditions. Their structures of synthesized compounds were characterizated by using micro analysis, Fourier transform (FT)-IR, 1H-NMR, 13C-NMR, MS, ultravioletvisible spectroscopy (UV-Vis). It was known that the synthesis of naphthoquinone derivatives is of great interest due to their strong activity as antimicrobial and anticancer agents. On the other hand, their biological activity mechanisms on the pathogens were yet investigated. Therefore, we aimed to examine the impact of three naphthoquinone derivatives on the pathogens activity. For this purpose, activity, and main biological metabolisms (e. g. protein, carbohydrate, lipid and antioxidant) of Pseudomonas aeruginosa and Bacillus subtilis were evaluated in the presence of naphthoquinone derivatives. The results indicated that Pseudomonas aeruginosa more inhibited in the presence of naphthoquinone derivatives compared to Bacillus subtilis.

Keywords: Quinone, Bioorganic Compound, Spectroscopy, Anticancer Agent, Biological Metabolisms,

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Synthesis and Biological Activity of New Vitamin K3 (Menadione) Analogues

Aesha F. SH Abdassalam
Dr.
Department of Chemistry, Istanbul University-Cerrahpasa, Turkey

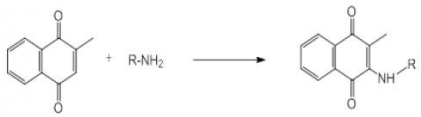
Nahide Gulsah Deniz
Assoc. Prof.
Department of Chemistry, Istanbul University-Cerrahpass, Turkey

Cigdem Sayil*
Prof.
Department of Chemistry, Istanbul University-Cerrahpasa, Turkey

Evren Ucar-Onay
Prof.
Department of Molecular Biology and Genetics, Istanbul University, Turkey

Elif Mertoglu
Dr.
Department of Molecular Biology and Genetics, Istanbul University, Turkey

Nazlı Arda
Prof.
Department of Molecular Biology and Genetics, Istanbul University, Turkey



Aminonaphthoquinone derivatives of vitamin K3 represent an important part of natural antibiotics [1, 2]. Many are toxic to a number of cancer cell lines because of their redox potential. For example; Anti-proliferative effects of vitamin K3 derivative, 2-methyl-3-(n-alkylamino)-1,4- naphthoquinone, 1 to 4 are {n: methyl, ethyl, propyl, and butyl} and 1 to 8 (n:methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, and octyl) homologized side chain derivatives against some cancer cells such as colon, brain and pancreas cell lines have been investigated by different methods [3]. In this study, derivatives of new vitamin K3 (menadione) were synthesized by the reactions of vitamin K3 with some heterocyclic rings substituted nucleophiles such piperazine, piperidine, pyrrolidine and morpholine (as shown in following figure 1). Figure 1. Their anti-proliferative effects were investigated against human cervical, breast, brain cancer cells, HeLa, MCF-7, U87-MG cell lines, respectively, and noncancerous embryonic kidney cells. Antioxidant activities of the compounds were also measured by DPPH and CUPRAC tests. All derivatives showed significant cytotoxic activity in HeLa cells, while most of them were non-toxic to healthy HEK-293 cells. However samples were not active in both antioxidant activity tests. REFERENCES [1] Nawrat, C.C.,Palmer, L.I., Blake, A.J., Moody C.J., 2013, Two approaches to the aromatic core of the aminonaphthoquinone antibiotics, The Journal of Organic Chemistry, 78, 5587-5603. [2] Kuttruff, C.A.,Geiger, S., Cakmak, M., Mayer, P., Trauner, D., 2012, An approach to aminonaphthoquinone ansamycins using a modified danishefsky diene, American Chemical Society, 14, 1070-1073. [3] Chadar, D.,

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Keywords: Vitamin K3, Piperazines, 1,4-naphthoquinone, Amines, Anti-proliferative, Antioxidant

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Investigation of Antibacterial Effects of Rose Essential Oil and Rose Absolute

Halime Çevikbaş*
Dr.
Department of Biology, Süleyman Demirel University, Turkey

Seyhan Ulusoy
Prof.
Department of Biology, Süleyman Demirel University, Turkey

Rosa damascena Mill. is a rose species that is known to have many biological properties, such as antibacterial, anti-cancer, antioxidant, and has important economic and cultural value for Turkey and particularly the province of Isparta, also known as the City of Roses. In this study, rose essential oil and rose absolute that are *R. damascena* Mill products, were investigated of antibacterial activity against *Staphylococcus aureus* (*S. aureus*) and *Escherichia coli* (*E. coli*) strains. Firstly, antibacterial effects of rose essential oil and rose absolute were determined by agar diffusion assay and then Minimum inhibitory concentrations (MICs) were determined by broth dilution assay. In the results; the inhibition zone diameter of 13 ± 0.6 mm in *S. aureus* strain and 12 ± 0.3 mm in *E. coli* strain tested with 20% rose essential oil was detected. Inhibition zone diameter of 10 ± 0.0 mm in *S. aureus* strain and 12 ± 0.0 mm in *E. coli* strain tested with 20% rose absolute was detected. MICs values for rose essential oil was determined as 0.0625% in *S. aureus* and 0.125% in *E.coli*; for rose absolute was determined as 0.0625% in *S. aureus* and 0.5% in *E.coli.* According to their MIC levels rose essential oil and rose absolute were evaluated as good potential natural antibacterial products.

Keywords: Rose Essential Oil, Rose Absolute, Antibacterial

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250cf8

ENHANCING TRIBOLOGICAL AND LUBRICANT PROPERTİES OF OIL BY NANOPARTICLE ADDITIVES

Merve Koranoz*
Ph.D. Student
Chemistry Dept., Petroyağ Lubricants, Turkey

Mustafa Akın
Dr.
Chemistry Dept., Petroyağ Lubricant, Turkey

Seda Çetintaş
Dr.
Chemistry Dept., Petroyağ Lubricant, Turkey

Widely used in industry and manufacturing units to protect products and tools from wear and maintain their associated surface qualities, lubricants have functional properties such as optimizing the coefficient of friction (COF) of manufacturing processes and excess heat accumulated in mechanical systems. Due to the ever-increasing speed and size of modern machines with the developing technology, it is of great importance to improve the properties of mineral oil in order to protect the machines from possible damage and to reduce energy consumption. The use of relatively small but effective additives in the formulation of the base stock is an effective way to improve the lubricating ability of base oils. Nanotechnology, one of the most important approaches for energy saving, emission reduction, and environmental protection in lubricants, offers an opportunity to improve the performance of the lubricant oil through the use of nano additives to improve certain properties such as friction and wear resistance. Various nanoparticles have been used to prepare nano lubricants, including polymers, metals, organic and inorganic materials. There are many studies in the literature reporting that nanoparticle dispersed lubricants are effective in reducing wear and friction levels. This work presents the results of experiments to improve the tribological and physicochemical properties of lubricant oil by adding inorganic-based nanoparticles. Both the physicochemical properties such as flashpoint and viscosity and the tribological properties such as wear scar diameter and coefficient of friction were analyzed for the prepared nano-lubricant at different of the nano-lubricant were analyzed at different Volume Concentrations (VC). While scanning electron microscopy (SEM) and energy distribution spectrum (EDS) were used to determine the characteristics and composition of the wear scar surface, the performance of the lubricant with respect to wear was measure by Four ball test.

Keywords: Lubricant Oil Additives, Nanoparticle, Nanotechnology, Tribology, Viscosity, Wear

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Chemical Properties, Fatty Acid Composition and Conjugated Linoleic Acid Content of Homemade and Commercial Butter Samples

Oğuz Gürsoy*
Prof.
Department of Food Engineering, Burdur Mehmet Akif Ersoy University, Turkey

Kübra Kocatürk
Mrs.
Department of Food Engineering, Burdur Mehmet Akif Ersoy University, Turkey

Ayşe Deniz
Mrs.
Department of Food Engineering, Burdur Mehmet Akif Ersoy University, Turkey

Hande Özge Güler Dal
Ph.D. Student
Department of Food Engineering, Burdur Mehmet Akif Ersoy University, Turkey

Yusuf Yilmaz
Prof.
Department of Food Engineering , Burdur Mehmet Akif Ersoy University , Turkey

In this study, some chemical properties, fatty acid composition and conjugated linoleic acid (CLA) contents of homemade (n=10) and commercial butter samples (n=10) produced from cow's milk were determined. Homemade samples obtained from local producers dealing with livestock in the different villages of Burdur province (Turkey) while commercial samples purchased from national and local markets. Mean dry matter content of commercial butters (84.15%) was higher than that of homemade samples (82.60%) ($p<0.05$). Insignificant difference was obtained between the mean fat contents of commercial (84.08%) and homemade (82.98%) butter samples ($p>0.05$). In addition, mean titratable acidity values of commercial and homemade butters were detected as 0.30 and 0.51 (% lactic acid), respectively ($p<0.05$). The mean CLA content was significantly higher for homemade samples (6.89 mg/g fat) compared to commercial samples (4.11 mg/g fat) ($p<0.05$). Relative ratios of polyunsaturated fatty acids for commercial and homemade butters were determined as 3.32% and 4.01%, respectively ($p>0.05$).

Keywords: Butter, Fatty Acid, Conjugated Linoleic Acid

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Effect of Ultrasonication of Heat-treated and Cooled Milk on Physicochemical, Rheological and Sensory Properties of Kefir Samples

Oguz Gursoy*
Prof.
Department of Food Engineering, Burdur Mehmet Akif Ersoy University, Turkey

Ozge Gokce
Ph.D. Student
Scientific and Technology Application and Research Center, Burdur Mehmet Akif Ersoy University, Turkey

Kubra Kocaturk
Mrs.
Department of Food Engineering, Burdur Mehmet Akif Ersoy University, Turkey

Yusuf Yilmaz
Prof.
Department of Food Engineering, Burdur Mehmet Akif Ersoy University, Turkey

Harun Kesenkas
Prof.
Department of Dairy Technology, Ege University, Turkey

The aim of the study was to determine the effect of ultrasonication treatment of heat-treated and cooled milk samples on some quality parameters of kefir. Milk samples were heat-treated at 90°C for 10 min and cooled down to 30±1°C immediately. The ultrasonication treatments of cooled milk samples were carried out at different sonication powers (100, 125 and 150W) and times (5 and 7 min) using an ultrasonic processor at a constant frequency of 24 kHz. Milk samples were kept at 30±1°C in a cooled bath in order to avoid any temperature rise during ultrasonication. Milk samples processed with conventional heating (10 min at 90°C) (control) or ultrasonication were equilibrated at 30±1°C and inoculated with commercial kefir starter culture. After incubation at 30±1°C, fermentation was continued up to the pH of 4.5±0.1. Kefir samples were stored at 4±1°C for 14 days, and some physicochemical, rheological and sensorial quality parameters of samples were determined at the 1st, 7th and 14th days of storage. Results showed that ultrasonication treatments did not influence the total solids, protein, fat, pH, acidity and color properties (CIE L*, a* and b* values) of kefir samples significantly ($p>0.05$). Serum separation values decreased significantly by ultrasonication treatment ($p<0.05$). The highest apparent viscosity values (at 120 rpm) and lowest serum separation values were determined in samples ultrasonicated at 125W power levels or higher. The power law model was used to describe the rheological behavior of kefir samples with determination coefficients between 0.972 to 0.999. According to rheological measurements, kefir samples exhibited a non-Newtonian behavior. In this study, results indicated that ultrasonication could improve the rheological properties of kefirs without any adverse effect on their physicochemical and sensory properties.

Keywords: Kefir, Ultrasonication, Viscosity, Serum Separation

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Possibilities of Using Bacteriophages as Bioprotective Agents in Milk and Dairy Products

Merve Al
Ph.D. Student
Department of Food Engineering, Akdeniz University, Turkey

Firuze Ergin
Dr.
Department of Food Engineering, Akdeniz University, Turkey

Ahmet Küçükçetin*
Prof.
Department of Food Engineering, Akdeniz University, Turkey

Nowadays, antibiotics are preferred in the protection of human and animal health, especially in the treatment of infectious diseases. Long-term consumption of animal products containing antibiotic residues cause microorganisms to develop resistance to antibiotics and this situation poses a threat to human health. The use of bacteriophages, which are defined as viruses that infect bacteria and are approximately 50 times smaller than bacteria, as bioprotective agents in food systems is one of the alternative approaches to the use of antibiotics. For this purpose, some commercial phage formulations like EcoShield, ListShield, SalmFresh can be used to prevent the growth of pathogenic bacteria such as *Escherichia coli*, *Listeria monocytogenes*, *Salmonella enterica*, in meat, fresh fruit, vegetables and dairy products. Milk has an important place in the adequate and balanced nutrition of people due to its protein, carbohydrate, fat, mineral substances and vitamins in its composition. Besides the milk, with its nutrients, high water content and approximately neutral pH value, is a suitable environment for the growth of microorganisms. Some researches have been carried out on the use of bacteriophages in the control of pathogenic bacteria in milk and dairy products. In this review, it is aimed to give information about the properties, stability and usage possibilities of bacteriophages as antimicrobial agents in milk and dairy products.

Keywords: Antibiotic, Bacteriophage, Milk, Dairy Products

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Effect of Ultrasound-Assisted Vacuum Impregnation Pre-Treatment on Antioxidant Activity of Diced Apples during Convective Drying

Ceren Karacaoğlu
Mrs.
Department of Food Engineering, Burdur Mehmet Akif Ersoy University, Turkey

Oguz Gursoy
Prof.
Department of Food Engineering, Burdur Mehmet Akif Ersoy University, Turkey

Yusuf Yilmaz *
Prof.
Department of Food Engineering, Burdur Mehmet Akif Ersoy University, Turkey

Apples are grown in many countries including Turkey and have a high economic value both in fresh and dried forms. Pre-treatments are applied to fruits prior to drying to shorten drying time and to obtain high quality products. In this study, atmospheric dipping (AD), vacuum impregnation (VI) and ultrasonication-assisted vacuum impregnation (US+VI) pre-treatments were applied to Granny Smith apple cubes (12x12x12mm) for 30 minutes, and they were dried at 40, 50 and 60°C for 7 hours. Then, the antioxidant activities of dried products were determined by the DPPH (2,2-diphenyl-1-picrylhydrazyl) assay. Dextrose (32.5%), sucrose (16.0%), ascorbic acid (1.0%) and calcium chloride (0.5%) were used as a impregnation solution. Antioxidant activities of apple cubes changed depending on drying temperature and time. As the drying temperature increased, a decrease in antioxidant activity values of apple cubes was determined for all pre-treatments. The antioxidant activity value of samples pre-treated by AD, VI and US+VI processes before drying at 40°C was approximately 524 mmol TE/100 g dm, and it decreased to 144, 152 and 158 mmol TE/100 g dm, respectively, at the end of the drying process ($p<0.05$). On the other hand, the antioxidant activity values of samples dried at 60°C decreased to 145, 145 and 146 mmol TE/100g dm at the end of drying for AD, VI and US+VI processes, respectively ($p>0.05$). It was found that the degradation of antioxidant activity values in apples dried after AD, VI and US+VI pre-treatments was the first-order reaction model. In conclusion, ultrasonication-assisted vacuum impregnation pre-treatment is a potential method to preserve the antioxidant activities of apple cubes during drying, but drying at high temperatures should be avoided.

Keywords: Vacuum Impregnation, Ultrasound, Apple, Convective Drying

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Effect of Ultraviolet (UV-C) Light in a Static System on Color Properties of Egg Yolks

Damla Bayana*
Ph.D. Student
Department of Food Engineering, Ege University, Turkey

Oguz Gursoy
Prof.
Department of Food Engineering, Burdur Mehmet Akif Ersoy University, Turkey

Yusuf Yilmaz
Prof.
Department of Food Engineering, Burdur Mehmet Akif Ersoy University, Turkey

Heat treatments like pasteurization and sterilization are used extensively in the production of safe foods in food industry; however, thermal processes may cause undesirable losses in the nutritive values of foods as well as their physico-chemical properties. In this study, the effect of UV-C light on color properties of egg yolks was determined. Egg yolks separated from their whites were exposed to UV-C light in a static environment for 0, 10, 20, 30, 40, 50 and 60 minutes. The maximum dose applied to egg yolk samples was 1618 J/m^2. Yolks treated with UV-C light were freeze-dried, and color measurements (CIELAB system) were performed in the lyophilizates of treated egg yolks. L* color values changed within the range of 83.55 and 78.49, but differences were found statistically insignificant ($p>0.05$). Similarly, a* color parameter indicating the redness of egg yolks ranged from 1.35 to 2.88 but differences was statistically insignificant ($p>0.05$). CIE b* color values, a yellow color index of egg yolks, ranged between 50.26 and 52.65, and the time of light treatment had an insignificant effect on the b* color value of egg yolk ($p>0.05$). In conclusion, under the conditions studied, the CIELAB color values determined on the freeze-dried egg yolks were as not influenced by the UV-C light treatment of egg yolks up to an hour.

Keywords: Ultraviolet, Egg Yolk, Color, Freeze Drying

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Design of a New Biosensor Platform for Creatinine Determination

Süleyman Çalışkan
Mr.
Department of Chemistry, Gazi University, Turkey

Deniz Akın Anakök*
Ph.D. Student
Department of Chemistry, Gazi University, Turkey

Servet Çete
Assoc. Prof.
Department of Chemistry, Gazi University, Turkey

In this study, a new amperometric biosensor for creatinine determination was developed. For this purpose, a polypyrrole-polyvinylsulfonate (PPy-PVS) film was prepared by electropolymerization of pyrrole in a polyvinylsulfonate medium on a platinum plate. Creatinase and sarcosine oxidase enzymes were immobilized on polypyrrole-polyvinylsulfonate film by cross-linking with glutaraldehyde. Contact angle images, SEM, and AFM of enzyme and non-enzyme surfaces were taken to determine the morphological and chemical properties of the Pt/PPy-PVS electrode. The determination of creatinine was made based on the oxidation of hydrogen peroxide at 0.4 V formed as a result of the enzymatic reaction on the surface of the prepared biosensor. The line ar working range of the biosensor obtained was found between 5.0×10^{-6} M and 1.0×10^{-4} M. Using this linear graph, the Km (observed) and Imax (observed) values for the double enzyme electrode system werecalculated as 5.0×10^{-3} mM and 0.34 µA/min, respectively. Optimum working pH and temperature weredetermined as 8.0 and 60 °C, respectively. The reusability and shelf life of the biosensor were determined. The effects of interferences in biological environments on biosensor response were investigated. For this purpose, uric acid, ascorbic acid, paracetamol, glycine, urea, and formaldehyde was used. The results have shown that the prepared biosensor has the potential to be used for creatinine determination in biological fluids.

Keywords: Biological Fluid, Biosensor, Creatinine, Polypyrrole, Polyvinylsulfonate, Sarcosine Oxidase

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Determination of Swelling Ratio on Carboxymethyl Cellulose-Based Hydrogel Using Acentral Composite Design

Ilkay Konçe*
Ph.D. Student
Department of Chemistry, Süleyman Demirel University, Turkey

Ebru Cubuk Demiralay
Prof.
Department of Basic Pharmaceutical Sciences, Süleyman Demirel University, Turkey

Yaşar Doğan Daldal
Dr.
Elbistan Vocational School of Health Services, Kahramanmaras Istiklal University, Turkey

This study, it was aimed to synthesize carboxymethyl cellulose-based hydrogel using citric acid as a crosslinker and to evaluate its water-holding ability. The central composite design method was used to determine the optimal working conditions for the synthesis of the hydrogel with its maximum water absorption capacity and to examine the main effect and interaction effect of the factors involved in the synthesis of the hydrogel. The effect of main factors such as polymer composition, sodium carboxymethyl cellulose, citric acid, and polyethylene glycol (PEG 6000/10000) concentration (w/w%) on swelling rate was evaluated. Optimization of the product component and statistical evaluation of all data were carried out with the Minitab Statistical Software program. When the results were evaluated, it showed that the superabsorbent hydrogel was produced under optimum conditions.

Keywords: Hydrogel, Swelling Behavior, Optimization, Central Composite Design

Acknowledgement: This work was financially supported by project no FDK-2020-8125 from Suleyman Demirel University Scientific Research Projects Coordination Unit, Isparta, Turkey

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98b297

V. International ISCMP TURKEY 2021
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New Generation of Biodegradable / Ecofriendly Synthetic Esters as Lubricants

Emel Atılal*
Ph.D. Student
R&D Center, Petroyağ Lubricants, Turkey

Mehmet Can Durmuş
Master Student
R&D Center, Petroyağ Lubricants, Turkey

Mustafa Akın
Dr.
R&D Center, Petroyağ Lubricants, Turkey

Lubricants can be defined as substances that introduced between two moving surfaces to reduce friction, maintenance heat balance and prevent abrasion and mechanical deformation that may occur during the process. These lubricants are often petroleum-based and recently the trend towards environmentally friendly alternative lubricants has increased due to depletion of reserves, their harmful effects on the environment and their prolonged degradation in nature. In recent years, there has been intensive studies towards to biodegradable lubricants that slowly started replacing traditionally used petroleum-derived lubricants. Biobased lubricants are favored not only for their biodegradability and sustainability but also for their unique physiochemical properties such as good lubricity, high flash point, high viscosity index and good resistance to shear compared to petroleum products. Nowadays, there is a growing enthusiasm for biobased lubricants as they furnish superior characteristics with unique flexibility. The triacylglycerol structure containing long, polar fatty acid chains is desirable for boundary lubrication because they interact strongly with metallic surfaces to form high-strength biolubricant films, reducing friction and wear. Hence, fatty acids are therefore believed to be key ingredients for lubricity. In this study, esters were obtained by using vegetable oils and different chain length fatty acids different with esterification and transesterification synthetized route. In addition, various process variables such as temperature, percentage of catalyst, amount of 2-Ethyl Hexanol and reaction time were optimized. Different esters were obtained as a result of esterification reaction with rapeseed oil, sunflower oil, palm kernel oil, olive oil, soybean oil, palmitic acid, stearic acid, lauric acid, myristic acid, oleic acid and 2-ethylhexanol. The structural and physical analyzes of the obtained esters were characterized by 13C NMR, 1H NMR and FTIR, TLC methods as well as TAN, saponification, viscosity, iodine value, flash point, pour point, peroxide value analyzes.

Keywords: Biolubricants, Transesterification, Biodegradability, Sustainability, Chemical Modification, Vegetable Oil

REGISTER NO
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V. International ISCMP TURKEY 2021
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Investigation of Antibacterial and Antibiofilm Effects of Phenyl Isothiocyanate

Cagdas Deniz Periz*
Ph.D. Student
Department of Biology, Süleyman Demirel Univesity, Turkey

Seyhan Ulusoy
Prof.
Department of Biology, Süleyman Demirel Univesity, Turkey

Isothiocyanates (ITCs) are natural plant compounds that result from the enzymatic degradation of glucosinolates in Brassicaceae vegetables. The purpose of the present study was to assess the antibiofilm activity of phenyl isothiocyanate (PITC), in *Pseudomonas aeroginosa* PA01 and *Staphylococcus aureus* ATCC 25923. Also, PITC was investigated for antibacterial activity against *P. aeroginosa*, *S. aureus*, and *Escherichia coli* ATCC 25922 strains. Firstly, the antibacterial effects of PITC were determined by agar diffusion assay. The biofilms were stained for 10 min with 0.1% crystal violet and the cells were washed with distilled water to remove excess dye. For quantification of attached cells, crystal violet was extracted with 95% ethanol and the absorbance was measured spectrophotometrically at OD570nm. It was observed that the PITC (by 2mM/mL) inhibited biofilm formation by 23% in *P. aeruginosa*, and (by 2mM) inhibited biofilm formation by 28% in *S.aureus* respectively. At the end of this research, it was proved that PITC can be a significant anti-biofilm agent.

Keywords: Phenyl Isothiocyanate, Antibiofilm, Antibacterial

Acknowledgement: This study is supported was financially supported by Project No: FDK-2020-8139 from the Research Foundation of Suleyman Demirel University, Isparta, Turkey, and by the YOK 100/2000 scholarship.

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V. International ISCMP TURKEY 2021
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Antioxidant and Coagulant Activities of Rose Essential Oil and Rose Absolute

Halime Çevikbaş*
Dr.
Department of Biology, Süleyman Demirel University, Turkey

Seyhan Ulusoy
Prof.
Department of Biology, Süleyman Demirel University, Turkey

Rose essential oil (REO) and rose absolute (RA) have many biological properties such as antibacterial, antibiofilm, antioxidant, coagulant, analgesic, hypnotic, antispasmodic, anti-inflammatory and anticonvulsant. In this study, antioxidant activity and anticoagulant activities of REO and RA were evaluated by 2,2-diphenyl-1-picryl-hydrazyl-hydrate (DPPH) and the time-dependent coagulation time of whole blood. In the present study, while butylated hydroxyanisole (BHA) solution used as positive control showed 90% activity, antioxidant capacity of the REO (0.5-0.0625%) and RA (0.5-0.0625%) were found 94-91% and 98-92% respectively. REO (0.5%) and RA (0.5%) showed complete coagulation in whole blood at 10 minutes, whereas the control displayed a prolonged time 30 minutes. The results indicated that the extent of antioxidant activity of the REO and RA may provide a good source of antioxidant.

Keywords: Rose Essential Oil, Rose Absolute, Antioxidant, Coagulant

Acknowledgement: This work was financially supported by a Project No FDK-2019-6862 from Research Foundation of Suleyman Demirel University, Isparta, Turkey and student was financially supported by YOK 100/2000 PhD Programme.

REGISTER NO

258be1

Polypyrrole Film Based Electrochemical Sensor for the Determination of Amoxicillin

Derya Kahraman*
Ph.D. Student
Department of Chemistry, Burdur Mehmet Akif Ersoy University, Turkey

Songül Şen Gürsoy
Prof.
Department of Chemistry, Burdur Mehmet Akif Ersoy University, Turkey

Conducting polymers have received much attention in recent years due to their potential applications in sensors [1]. Some of the most commonly used conductive polymers are polyaniline (PANI), polypyrrole (PPy), polythiophene (PTh) and etc [2]. Polypyrrole (PPy) is particularly widely used in electrochemical actuators due to its electrochemical stability, fast actuation speed and high selectivity [3]. Many studies have been reported using various electrochemical sensors based on conducting polymers [4]. Determination of antibiotics are achieved various techniques such as spectroscopy [5], flow injection analysis [6] and HPLC [7]. However, the studies about antibiotic determination with biosensors based on conducting polymers are limited. In this study we focused on to prepare polypyrrole based sensor for the study of electrochemical behaviour of amoxicillin in pharmaceutical formulation. In this work, polypyrrole film based electrochemical amoxicillin sensor has been developed. Three voltammetric techniques (CV (cyclic voltammetry), SWV (square wave voltammetry) and DPV (differential puls voltammetry) were applied to determine amoxicillin. According to SWV and DPV studies there is no significant effect of increasing the amoxicillin concentration on the oxidation peak current of amoxicillin. CV results show that the increasing of amoxicillin concentration could be detected by cyclic voltammetric study. As a result, CV method was choosen to detect amoxicillin. The polypyrrole film modified GCE showed visible response for the oxidation of amoxicillin, characterized by the increament of the peak current.

Keywords: Conducting Polymer, Antibiotic, Polypyrrole, Amoxicillin, Sensor

Acknowledgement: The authors would like to thank the Burdur Mehmet Akif Ersoy University, Scientific Research Projects Foundation (Project number: 0719-DR-21)

References: [1] Jain R., Jadon N., Pawaiya A. (2017). Polypyrrole based next generation electrochemical sensors and biosensors: A review. Trends in Analytical Chemistry 97. 363-373. [2] Dakshayini BS., Reddy K.R., Mishra A., Shetti N.P., Malode SJ., Basu S., Naveen S., Raghu A.V.(2019). Role of conducting polymer and metal oxide-based hybrids for applications in amperometric sensors and biosensors. Microchemical Journal 147, 7-24. [3] Tiny M.S., Narasimhan B.N., Sejdic JT., Malmström J. (2021).Soft conducting polymer polypyrrole actuation based on poly (N-isopropylacrylamide) hydrogels. Sensors & Actuators: B. Chemical 343, 130167 [4] H. Çiftçi, U. Tamer, Functional gold nanorod particles on conducting polymer poly(3-octylthiophene) as non-enzymatic glucose sensor, Reactive and Functional Polymers 72 (2012) 127-132. [5] A. Garcia-Reiriz, P.C. Damiani, A.C. Olivieri, Different strategies for the direct determination of amoxicillin in human urine by second-order multivariate analysis of kinetic-spectrophotometric data, Ta lanta 71 (2007) 806-815. [6] Indirect Flow-Injection Spectrophotometric Determination of Some β-Lactam Antibiotics Idrees F. Al-Momani* , Mohammad R. Thalji, Jordan Journal of Pharmaceutical Sciences, V olume 14, No. 2, 2021

REGISTER NO

74071a

Discharge Voltage Induced Sructural and Optical Properties of Bimetallic Ag:ZnO Nanoparticles by the Spark Generation

Tayyar Güngör*
Prof.
Department of Energy Systems Engineering, Burdur Mehmet Akif Ersoy University, Turkey

Ebru Güngör
Assoc. Prof.
Department of Energy Systems Engineering, Burdur Mehmet Akif Ersoy University, Turkey

The synthesis of silver-doped zinc oxide (Ag:ZnO) nanoparticles (NPs) on the glass substrates was carried out using a spark discharge system at voltages of 4.3 kV and 7 kV for atmospheric pressure. Ag:ZnO NPs were structurally and optically characterized using various techniques. The X-ray diffraction (XRD) pattern clearly showed the presence of crystalline metal oxide phases. For Ag:ZnO samples a considerable shift in the peak positions for (100) direction was observed with the effects of Ag. The scanning electron microscopy (SEM) analysis confirmed that the shape of NPs depends on the discharge voltage. In the study, triangular silver NPs and mixture of spherical and cubic NPs for Ag-Ag electrodes, spherical NPs and shell-like NPs for Zn-Zn electrodes, and partially deformed spherical particles for Ag-Zn electrodes were observed for the 4.3 kV and 7 kV discharge voltage, respectively. Optical studies indicated that the band gap of Ag:ZnO decreased (red-shift) when the Ag-Zn electrodes were used. Thicknesses of films with ZnO, AgO, and Ag doped ZnO NPs were determined as 140 nm, 130nm, and 170 nm.

Keywords: Ag Doping, ZnO, Nanoparticle, Spark Discharge

Acknowledgement: This study was supported by TUBİTAK with the number of Project 116F046 and Scientific Research Unit of Burdur Mehmet Akif Ersoy University with the number of projects 110-NAP-10, 100-NAP-10, 172-NAP-13, 173-NAP-13, 0324-NAP-16, 0356-NAP-16, and 0253-MP-14.

REGISTER NO
9a9687

Theoretical Study of the Internal Rotational Barriers of Mono-, Di-, and Trihalogenated Ethanes

Avni Berisha*
Prof.
Department of Chemsitry, University of Prishtina, Kosovo

Doruntina Aliu
Master Student
Department of Chemsitry, University of Prishtina, Kosovo

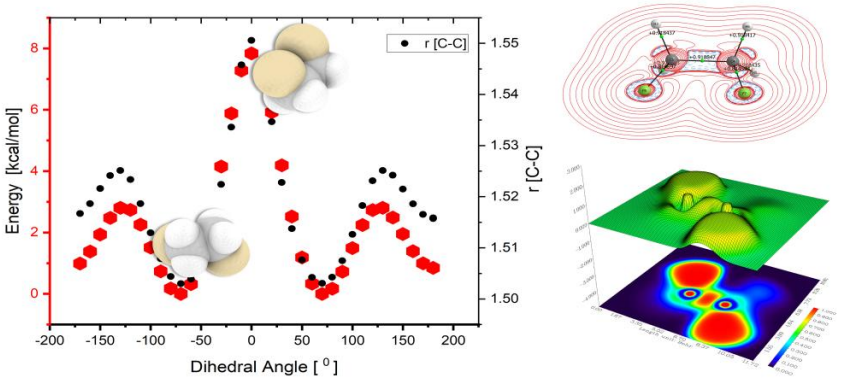
Valbonë Mehmeti
Dr.
Department of Chemsitry, University of Prishtina, Kosovo

Ariantit Reka
Assoc. Prof.
Department of Chemsitry, University of Tetova, Macedonia

Omar Dagdag
Dr.
Department of Chemistry, Université Ibn Tofail, Morocco

Rajesh Haldhar
Dr.
Department of Chemsitry, Lovely Professional University, India

Ayhan Oral
Prof.
Department of Chemsitry, Çanakkale Onsekiz Mart University, Turkey



The physical and chemical characteristics of flexible molecules are heavily influenced by their internal rotation barriers. In this context, organic halides are relatively common, and the nature of their rotation barriers in many cases remains still unclear. Natural Bond Orbitals (NBO), Quantum Theory of Atoms in Molecules (QTAIM) and Bond order analysis all demonstrated that internal rotational barriers are affected by a variety of factors, including substitution pattern, number and type of halogen atoms on the first and second carbon atoms of an ethane molecule, and so on. Several analysis methodologies, such as delocalization indexes [DI(A)] via QTAIM analysis and NBO analysis, were used to acquire profound insights into the factors associated to the internal rotational barriers of mono-, di-, and trihalogenated ethanes. The increase of the barriers caused by the addition of successive halogen atoms for substituted ethanes is dominated by the enormous electronic volume of these halogens, which causes strong steric repulsion.

Keywords: Qtaim, NBO, DFT, Bond Order, Rotational Barrier, Halogenated Ethanes

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V. International ISCMP TURKEY 2021
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Spectroscopic and Theoretical Study of the 2E, 5E)-2,5-Bis (2-methoxybenzylidene)cyclopentanone

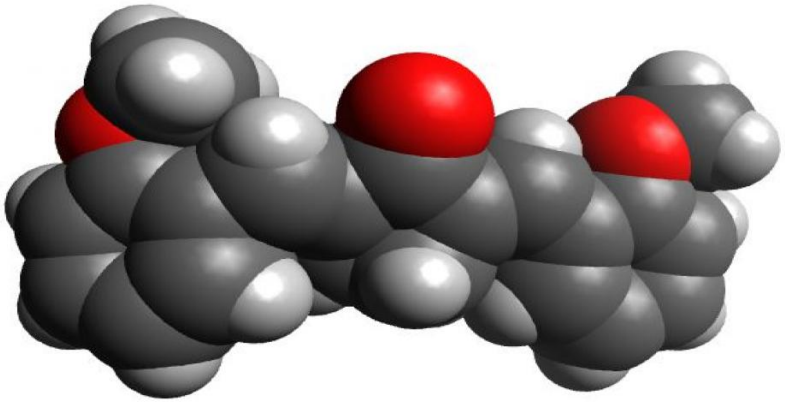
Veprim Thaçi*
Ph.D. Student
Institute of Chemistry, Ss. Cyril and Methodius University in Skopje, Macedonia

Ramiz Hoti
Prof.
Department of Chemistry, University of Prishtina, Kosovo

Avni Berisha
Prof.
Department of Chemistry, University of Prishtina, Kosovo

Arianit Reka
Prof.
Department of Chemistry, University of Tetovo, Macedonia

Jane Bogdanov
Prof.
Institute of Chemistry, Ss. Cyril and Methodius University in Skopje, Macedonia



The present study aimed to analyze the nature of the dissimilarity among solid and dissolved (dichloromethane and carbon tetrachloride) monocarbonyl compounds. The experimental spectroscopic results awere compared to theoreticly simulated spectra using Density Functional Theory (DFT). The theoretical analysis of lowest energy conformers of (2E, 5E) -2,5-Bis (2-methoxybenzylidene) cyclopentanone were carried out using DFT/B3LYP functional with 6-311g++(d,p) with Dispersion correction (D3). The electronic absorption spectra of the molecule were obtained by the time-dependent DFT method at the same level of theory and directly compared to experimental results.

Keywords: MACs, Infrared Spectra, DFT, UV-VIS Spectra, Dispersion Correction, Solvent Effects

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V. International ISCMP TURKEY 2021
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The Presence of Heavy Metals in Obiliq's Dairy Products (Kosovo)

Mentor Xhelil Ismaili*
Ph.D. Student
Department of Chemistry, St. Kliment Ohridski University in Bitola, Macedonia

Avni Berisha
Prof.
Department of Chemistry, University of Prishtina, Kosovo

Dzulijana Tomovska
Prof.
Department of Food Chemistry and Technology, St. Kliment Ohridski University in Bitola, Macedonia

Food safety is a necessity for consumption of milk and dairy products, which must be free of physical, biological, and chemical contamination. Chemical contamination with the heavy metals: Pb, Cd, . . . is often sourced from the environment, including water, grass, feed additives, medications, and agricultural equipment. Contamination of milk and dairy products can have a detrimental effect on the quality and safety of food intended for human consumption. The purpose of this study is to determine the presence of heavy metals: As, Cd, Cr, Cu, Fe, Hg, Pb and Zn in fresh and pasteurized milk. The research was conducted via a case study, with the data gathered being evaluated descriptively. Milk samples were collected in Obiliq. Nine samples of fresh milk were collected directly from dairy farms, while nine samples of pasteurized milk were obtained from nearby farmers.

Keywords: Heavy Metals, Pb, Contamination, Milk, Food Safety, Dairy

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V. International ISCMP TURKEY 2021
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Determination of Some Physic-Chemical Parameters as Fats, Humidity Salinity at Soft, Semi-Strong and Strong Cheese Produce in North Macedonia

Kanarina Termkolli*
Master Student
Department of Chemistry, University of Prishtina, Kosovo

Hamit Ismaili
Prof.
Department of Chemistry, University of Prishtina, Kosovo

Veprim Thaçi
Phd. Student
Department of Chemistry, University of Prishtina, Kosovo

Ramiz Hoti
Prof.
Department of Chemistry, University of Prishtina, Kosovo

The history of cheese production turns out to be a coincidence, a product thus discovered during the transport of fresh milk to the organs of ruminants such as sheep, goats, cows and buffalo. So cheese production preceded the preservation of milk. Research also shows that the human body uses the nutritional value of cheese more easily than milk. In terms of composition, cheese is a food rich with protein, even compared to other foods such as meat or eggs, cheese contains more protein up to 30%. Cheese is an important part of world food, approximately 14,000,000 tons per year, of which 40% is produced in European Union countries. Our interest was to determine the some physic-chemical parameters as fat, pH, salinity and dry residue at soft, semi-strong and strong cheese. The sample was taken in three companies in North Macedonia which that deal with the production processing of milk and dairy products.

Keywords: Cheese, Milk, Protein, Salinity, pH, Fat

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69421f

V. International ISCMP TURKEY 2021
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September 29 - October 1, 2021 Burdur / Turkey

The Synthesis of Novel Derivatives of their Corresponding Tetrazoles and their Antimicrobial Activity

Enis Haxhijaj*
Master Student
Department of Chemistry, University of Prishtina, Kosovo

Arber Selimi
Master Student
Department of Chemistry, University of Prishtina, Kosovo

Veprim Thaçi
Phd. Student
Department of Chemistry, University of Prishtina, Kosovo

Ramiz Hoti
Prof.
Department of Chemistry, University of Prishtina, Kosovo

Hamit Ismaili
Prof.
Department of Chemistry, University of Prishtina, Kosovo

Osman Hasku
Mr.
Chemistry and Microbiology Laboratory, "TreFarm"Drug Factory, Kosovo

The new triazole derivatives were synthesized from 3-chloro-4-coumarin carbaldehyde by condensation reactions based on 4-hydroxy coumarin in the presence of heater and $POCl_3$ as catalyst. 3-Chloro-4-coumar carbaldehyde was then cycled with various heterocyclic amines in the presence of sulfuric acid as catalyst, and tetrazole analogues of the corresponding amines were obtained. Purification of the product 3 - [(4,6-dimethyl pyridinyl-2-imino) -methyl] -4-chloro cromen-2-one and 3 - [(5-chloro pyridinyl-2-imino) -methyl] -4- chloroc romen-2-one was made in the presence of hot ethanol solvent and the reaction was performed by TLC. Structural characterization was done with FTIR and NMR. These obtained compounds have been tested for their microbiological activity in several types of bacterial cultures and at 2mg, 4mg and 6mg by the Kirby Bauer method.

Keywords: Triazole, Condensation, $POCl_3$, NMR, FTIR, Microbiological Activity

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V. International ISCMP TURKEY 2021
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Synthesis of New Tetrazole Derivatives and their Antimicrobial Activity

Enis Haxhijaj*
Master Student
Department of Chemistry, University of Prishtina, Kosovo

Arber Selimi
Master Student
Department of Chemistry, University of Prishtina, Kosovo

Veprim Thaçi
Prof.
Department of Chemistry, University of Prishtina, Kosovo

Ramiz Hoti
Prof.
Department of Chemistry, University of Prishtina, Kosovo

Hamit Ismaili
Prof.
Department of Chemistry, University of Prishtina, Kosovo

Osman Hasku
Mr.
Chemistry and Microbiology Laboratory, "TreFarm" Drug Factory, Kosovo

The corresponding triazole derivatives were synthesized starting from 3-chloro-4-cumarine carbaldehyde by condensation reactions based on 4-hydroxy coumarin in the presence of heater and POCl3 as catalyst. Compounds 3-[(3,5-dichloro pyridinyl-2-imino) -methyl] -4-chloro-2-one-chlorine and 3-{(3-bromo-pyridinyl-2-imino) -methyl} -4-chloro-chromene -2-one was obtained by cycling reactions in the presence of various heterocyclic amines in the presence of sulfuric acid as a catalyst. Purification of the product was done with hot ethanol. Structural characterization was done with FTIR and NMR. The compounds were tested for their microbiological activity in various bacteria at concentrations of 2mg, 4mg and 6mg by the Kirby Bauer method.

Keywords: Coumarin, Triazole, NMR, Microbiological Activity, Kirby Bauer, Sulfuric Acid

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V. International ISCMP TURKEY 2021
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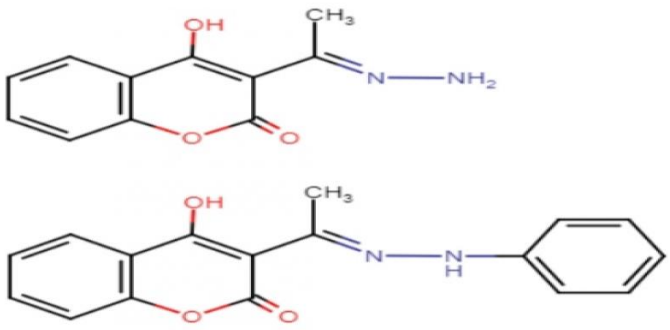
The Synthesis and Anticoagulant Properties Test of New Coumarine Derivatives

Besar Racaj*
Other
Department of Chemistry, University of Pristina, Kosovo

Veprim Thaçi
Prof.
Department of Chemistry, University of Pristina, Kosovo

Ramiz Hoti
Prof.
Department of Chemistry, University of Pristina, Kosovo

Hamit Ismaili
Prof.
Department of Chemistry, University of Pristina, Kosovo



With condensation reactions using 4-hydroxicoumarine as a starting reagent we successfully achieved the synthesis of two new coumarine derivatives: 3-(1-hydrazino)-ethyl-4-hydroxicromen-2-one and 4-hydroxi-3-(1-phenylhydrazino)-ethyl-cromen-2-one. The general synthesis reactions were done with long processes of refluction in high temperatures while using $POCl_3$, ethanol and triethylamine as catalisators. The characterization of the compounds structures was done by NMR and FTIR spectroscopy. The new derivatives then were testet in order to see their anticoagulant properties. Studying their respective structures and properties could lead to better understanding of coumarine derivatives anticoagulant effects and thus help the synthesis of better ones in the future. Anticoagulant properties were measured by general methods which are widely used nowadays.

Keywords: Coumarine Derivatives, NMR, FTIR, Anticoagulant, Synthesis

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V. International ISCMP TURKEY 2021
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September 29 - October 1, 2021 Burdur / Turkey

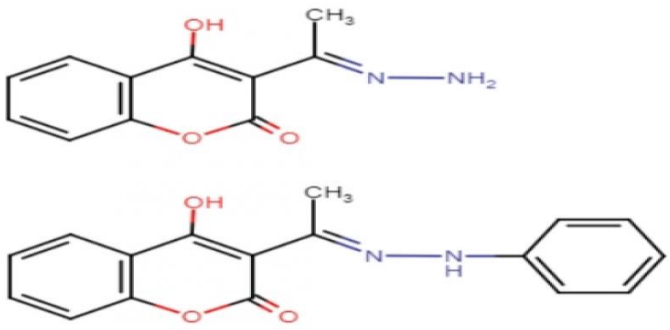
Anticoagulant Properties of Newly Synthesized Coumarine Derivatives

Besar Racaj*
Other
Department of Chemistry, University of Pristina, Kosovo

Veprim Thaçi
Prof.
Department of Chemistry, University of Pristina, Kosovo

Ramiz Hoti
Prof.
Department of Chemistry, University of Pristina, Kosovo

Hamit Ismaili
Prof.
Department of Chemistry, University of Pristina, Kosovo



The synthesis of two products 3- (1-hydrazino) -ethyl-4-hydroxicromen-2-one and 4-hydroxi-3-(1-phenylhydrazino) -ethyl-cromen-2-one is the focus of this study. Characterization of the compounds was done by NMR and FTIR spectroscopy. The new derivatives were then tested in laboratory rats in order to study their properties as anticoagulants. Studying their respective structures and properties can lead to a better understanding of the anticoagulant effects of gambling derivatives and thus aid in the synthesis of the better ones in the future. Anticoagulant characteristics were measured by activated partial thromboplastin time (APTT), prothrombin time, and thrombin time (TT) by screening method.

Keywords: Anticoagulant, Derivatives, FTIR, Thrombine Test, Synthesis, NMR

REGISTER NO

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V. International ISCMP TURKEY 2021
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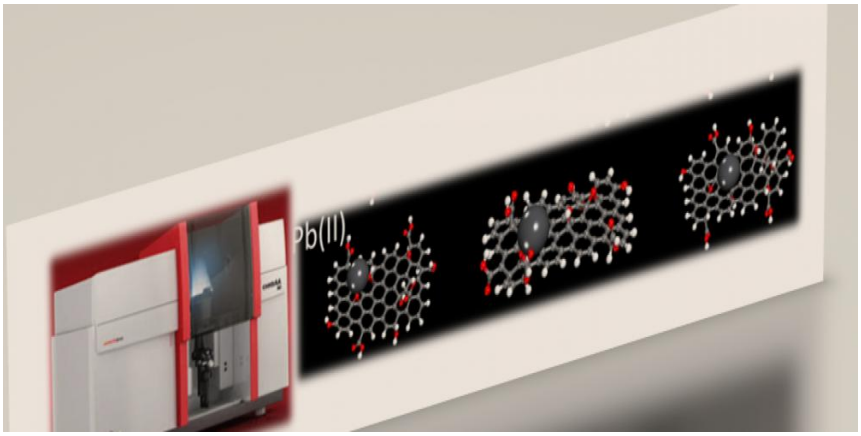
The Adsorptive Removal of Pb(II) and Cr(VI) Ions from Aqueous Solution by Grapheneoxide

Rinor Besim Zejnullahu*
Other
FSHMN-Departamenti i Kimisë, Univeriteti I Prishtinës, Kosovo

Albert Maxhuni
Prof.
Department of Chemistry, University of Prishtina, Kosovo

Avni Berisha
Prof.
Department of Chemistry, University of Prishtina, Kosovo



Graphene oxide (GO) is the aim in this investigation to test its adsorptive properties toward: chromium and nickel ions. The GO synthesis was done using the Hummers process of chemical oxidation, which converts graphite particles into oxide-rich ones.FTIR and UV-Vis spectroscopy were used to analyze the produced GO adsorbent. This material was utilized to adsorb Cr(VI) and Pb(II) ions. The concentration of these ions after the adsorption was determined using Atomic Absorption Spectrometry (AAS). To study the best adsorption location, adsorption type, and adsorption energy of GO toward Pb(II) and Cr(VI) ions, the DFT and Monte Carlo calculations were used. Finally, to determine noncovalent interactions, adsorption sites that are the most stable were selected.

Keywords: DFT, Monte Carlo, Heavy Metals, Lead Ions, Chromium Ions, Atomic Absorption Spectrometry

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eba0dc

V. International ISCMP TURKEY 2021
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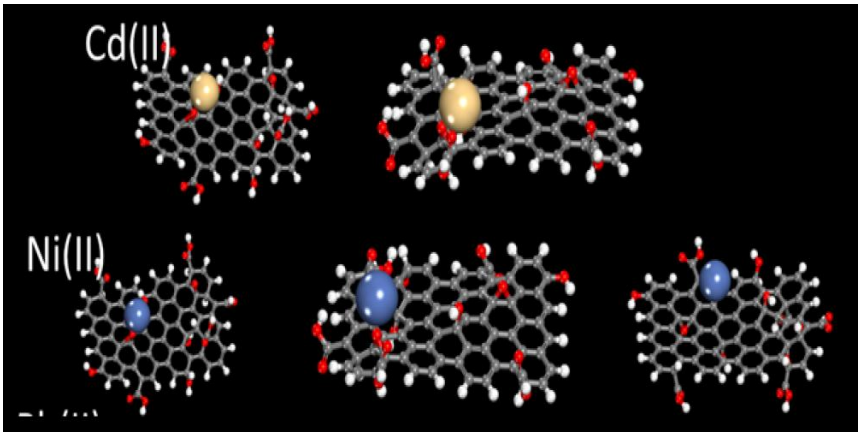
Graphene Oxide as an Effective Adsorbent for Cd(II) and Ni(II) Ions

Rinor Besim Zejnullahu*
Other
FSHMN-Departamenti i Kimisë, Univeriteti I Prishtinës, Kosovo

Albert Maxhuni
Prof.
Department of Chemistry, University of Prishtina, Kosovo

Veprim Thaqi
Phd. Student
Department of Chemistry, University of Prishtina, Kosovo

Avni Berisha
Prof.
Department of Chemistry, University of Prishtina, Kosovo



We are investigating graphene oxide (GO) in order to determine its adsorptive characteristics toward cadmium and nickel, which are both heavy metal ions. The GO synthesis was accomplished by the use of the Hummers method of chemical oxidation. The FTIR and UV-Vis spectroscopies were utilized to structurally characterize the GO. This material was used to adsorb Cd(II) and Ni(II) ions. Atomic Absorption Spectrometry was used to measure the concentration of these ions after they had been adsorbing (AAS). The DFT and Monte Carlo simulations were used to determine the optimal adsorption site, adsorption type, and adsorption energy of GO toward CdII) and Ni(II) ions. Finally, in order to determine noncovalent interactions, the most stable adsorption sites were chosen for investigation.

Keywords: Monte Carlo, DFT, Cd Ions, Ni Ions, Graphene Oxide, Adsorption

REGISTER NO

ccb1d4

Synthesis of Some Novel Thiazolo-4-Hydroxycoumarin Derivatives with Potentialbiological Effects

Arjan Ganiji*
Ph.D. Student
Faculty of Technological Science, University Mother Teresa Skopje, Macedonia

Ahmed Jashari
Assoc. Prof.
Department of Chemistry, University of Tetova, Macedonia

Coumarins are group of heterocyclic compounds synthesized or isolated from numerous plant species as well as by some bacteria and fungi. According to their chemical structure, they belong to the family of benzopyrones. So far, more than 1300 different coumarins have been identi?ed. Coumarin itself, has been extensively studied both in biochemical and pharmaceutical fields. Over the past decades, many studies have reported that coumarins and their derivatives exert a plethora of biological activities including antimicrobial, antiviral, anticoagulant, anti-inflammatory, and anticancer effects. Meanwhile, many studies have reported a beneficial effect of coumarins on other types of cancer including malignant melanoma, leukemia, renal cell carcinoma, prostate and breast cancer cells progression. Furthermore, a number of nitrogen-rich compounds were found tobe good chemotherapeutic. On the other hand, thiazole derivatives have attracted considerable attention due to their wide application in the field of pharmaceuticals. Given the high degree of bioactivity shown by 4-hydroxycoumarin and aminothiazole derivatives, our area of interest has been to synthesize some new structural entities containing both heterocyclic nuclei in a single molecular skeleton. Of particular interest are the indications that the increase in hydrophobicity of the thiazole increases the anticancer activity. For that purpose, new derivatives with alkyl and aryl substituents were synthesized on the thiazole part of the coumarinskeleton, with the intention of gradually increasing the hydrophobicity and in the same time increseasing thecytotoxic and antiproliferative activities of this new family of small organic molecules.

Keywords: 4-Hydroxycoumarin, Thiazol derivatives, Biological Effects

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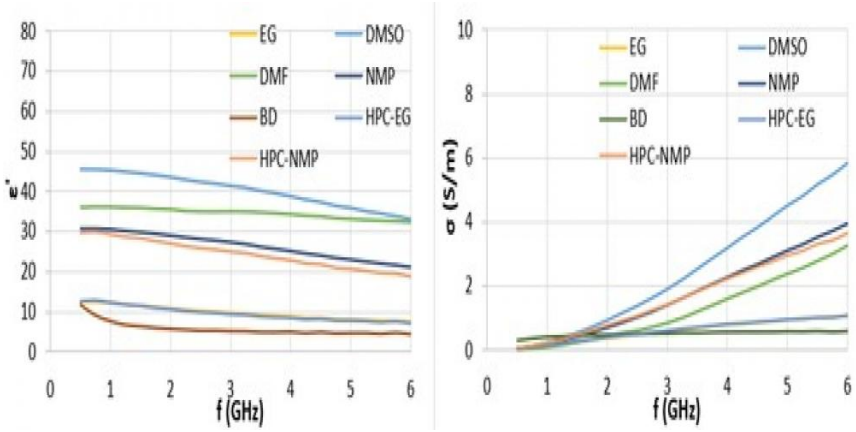
Phantom Preparation for Microwave Breast Cancer Imaging

Sinem Yildiz*
Master Student
Polymer Science and Technology, Istanbul Technical University, Turkey

Metin Hayri Acar
Prof.
Department of Chemistry, Istanbul Technical University, Turkey

Tuba Yilmaz
Assoc. Prof.
Department of Electronics and Communication Engineering, Istanbul Technical University, Turkey

Ibrahim Akduman
Prof.
Department of Electronics and Communication Engineering, Istanbul Technical University, Turkey



This paper presents characterization of tissue mimicking materials for microwave breast cancer diagnosis. A great deal of phantom formulations is published in reported works, jointly with its own frequency band, accuracy or materials used [1,2]. One common phantom material used for both breast cancer imaging and hyperthermia is the gels, which are normally created by adding around a 0.5-5% of a natural polymer [3], such as agar or gelatin, within the liquid mixture, so that the gels are mostly water in their composition. In another study [4], poly(2-hydroxyethyl acrylate) (PHEA) hydrogel with acetonitrile-water mixtures were used to imitate different body tissues in a wide band-with (2-26.5 GHz). There are various constraints, which include the dielectric property necessity, cost, suitability of the ingredients in phantom characterization. For pristine-based materials and solutions (with high boiling points solvents), the goal is to achieve slight slopes in the dielectric trend with frequency, i.e., values do not decrease sharply, which is more similar to the actual behavior of tissues. For this purpose, ethylene glycol (EG), dimethyl sulfoxide (DMSO), dimethyl formamide (DMF), N-methyl-2-pyrrolidone (NMP) and 1,4-butandiol (BD) were used as solvent. Dielectric property measurements of the material is performed with broadband contact probe technique and a probe with an attached standard RF cable is used to ensure to minimize the connection errors. Dielectric property measurements of the solvents and their mixtures with thicker which is hydroxypropyl cellulose (HPC) are given in Figure 1 and 2. Permittivity and conductivity of the material at 0.5 to 6 GHz range were measured between as 45 to 13 and 0.3 to 6 (S/m), respectively.

Keywords: Phantom, Breast Cancer, Dielectric Properties, Microwave Hyperthermia

Acknowledgement: This work is supported by The Scientific and Technological Research Council of Turkey (TUBITAK) up on the project 113E977.

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Antibiotic Resistance of *Staphylococcus aureus* Isolated from Raw Milk and Dairy Products

Gülşah Çobankaya*
Master Student
Department of Biology, Süleyman Demirel University, Turkey

Seyhan Ulusoy
Prof.
Department of Biology, Süleyman Demirel Universityiy, Turkey

S. aureus is an important cause of food intoxication. This foodborne pathogen is considered as one of the world's leading causes of disease outbreaks related to food consumption, being responsible for a variety of diseases. The objectives of this study were to evaluate the prevalence and the antibiotic resistance of *S. aureus* isolated from raw milk and dairy products. *S. aureus* was isolated from 32 out of 100 (32.0%) in Isparta. Resistance of the strains to antibiotics was determined by the Kirby-Bauer disc diffusion test. The *S. aureus* isolates showed resistance to, followed by, oxacillin (100%). All strains were susceptible to tetracycline, penicillin G, ciprofloxacin and clindamycin. This study confirmed the presence of *S. aureus*, indicating poor sanitary conditions during processing which may create a health risk for consumers.

Keywords: Antibiotic resistance, *Staphylococcus aureus,* Milk, Dairy Products

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Heterogeneous Catalysis of Diesel Fuel for Aerobic Oxidative Desulfurization using Micro-Crystals of Heteropoly Amphiphilic Keggin-type Catalyst

Tawel Oumrou Taleb Amar
Dr.
Department of Chemistry, Faculty of Sciences of Bizerte, University of Carthage, Tunisia

Akriche Toumi Samah*
Prof.
Department of Chemistry, Faculty of Sciences of Bizerte, Tunisia

Abstract. Micro-crystals of heteropolyoxometalate Keggin-type (2-$H_2NC_5H_4NH$)5[$PV_2W10O40$].2H_2O (2-APPV2W10O40) catalyst were successfully grown by a facile hydrothermal synthesis and employed in aerobic oxidative desulfurization process (ODS). The composition and structure of as-synthesized material was characterized by means of chemical analysis, XRD, FT-IR, UV-Vis, fluorescence, SEM and XRF measurements. X-ray structure and Hirshfeld analyses indicated that 2-APPV2W10O40 exhibit 3D-porous architecture of V-substitued heteropolyanion [PV2W10O40]5- core templated with 2-aminopyridinium (2-AP) and water species encapsulated in the created shell voids by establishing multiple intermolecular interactions. Furthermore, the micro-crystals of the amphiphilic catalyst induced efficient performance in aerobic oxidative desulfurization process, since they have been found to be effective in catalyzing air oxidation of the sulfur containing molecules in real diesel sample to their corresponding sulfones which are conveniently removed by extraction with polar solvent to reduce the sulfur level in diesel with 96% heterogeneous catalyst efficiency and the catalyst could be recovered and reused without loss of activity.

Keywords: Oxydative Desulfurization, Heteropoly Keggin Type, Heterogeneous Catalysis, Crystal Structure

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A New Series of EGFR-Targeted Antitumor Agents against Non-small Cell Lung Cancer

Ahmet Özdemir*
Prof.
Department of Pharmaceutical Chemistry, Anadolu University Faculty of Pharmacy, Turkey

Belgin Sever
Assoc. Prof.
Department of Pharmaceutical Chemistry, Anadolu University Faculty of Pharmacy, Turkey

Mehlika Dilek Altıntop
Prof.
Department of Pharmaceutical Chemistry, Anadolu University Faculty of Pharmacy, Turkey

Hiroshi Tateishi
Dr.
Medicinal and Biological Chemistry Science Farm Joint Research Laboratory, Kumamoto University Faculty of Life Sciences, Japan

Masami Otsuka
Prof.
Medicinal and Biological Chemistry Science Farm Joint Research Laboratory, Kumamoto University Faculty of Life Sciences, Japan

Mikako Fujita
Prof.
Medicinal and Biological Chemistry Science Farm Joint Research Laboratory, Kumamoto University Faculty of Life Sciences, Japan

Halil I Ciftci
Dr.
Medicinal and Biological Chemistry Science Farm Joint Research Laboratory, Kumamoto University Faculty of Life Sciences, Japan

Non-small cell lung cancer (NSCLC) poses a serious threat to public health due to its increasing incidence and high mortality. Despite substantial advances in diagnostic and therapeutic approaches, the overall survival of NSCLC patients remains poor. Because of the nonselective destruction of cells by cytotoxic therapy, in recent years targeted therapy has come into prominence [1]. Epidermal growth factor receptor (EGFR) is a member of the ErbB/HER family of receptor tyrosine kinases (RTKs). The overexpression of EGFR results in uncontrolled cell division and corresponding tumor growth, migration, stromal invasion, resistance to apoptosis, and angiogenesis and therefore it is one of the most valuable drug targets for the treatment of NSCLC. Although many EGFR inhibitors have been approved and several promising candidates are in various stages of clinical evaluation for NSCLC therapy, great efforts are still being devoted to the development of small molecules exerting anticancer activity towards NSCLC through the inhibition of EGFR [2]. In the current work, the microwave-assisted synthesis of new 2,4-dihydroindeno[1,2-c]pyrazoles (1-7) was performed efficiently. These compounds were tested for their in vitro cytotoxic effects on A549 human lung adenocarcinoma cells and peripheral blood mononuclear cells (PBMCs). 2-(4-Bromophenyl)-6-chloro-7-methoxy-3-[4-(piperidin-1-yl)phenyl]-2,4-dihydroindeno[1,2-c]pyrazole (4) showed more potent anticancer activity with an IC50 value of 6.13 µM against A549 cell line than erlotinib (IC50= 19.67 µM), a well-known EGFR inhibitor used in the treatment of NSCLC. The IC50 value of compound 4 for PBMCs indicated that its anti-NSCLC activity was selective. Due to its selective anticancer activity, compound 4 was investigated for its EGFR inhibitory activity. The results showed that compound 4 displayed potential EGFR inhibitory activity with an IC50 value of 17.58 µM. The in vitro findings reveal that the introduction of 4-bromophenyl moiety into the main scaffold is of great importance for antitumor activity as well as EGFR inhibitory activity.

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Keywords: Non-small Cell Lung Cancer , Epidermal Growth Factor Receptor, Microwave-Assisted Synthesis, 2,4-dihydroindeno[1,2-c]pyrazoles, Receptor Tyrosine Kinases, Anticancer Activity

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05f971

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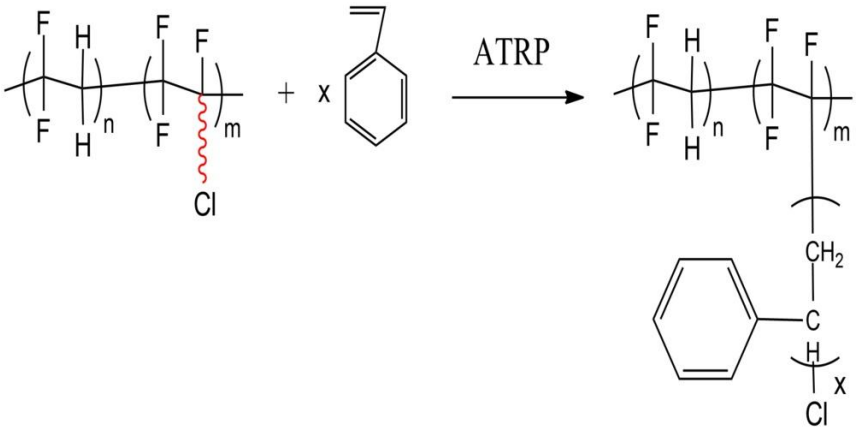
Towards Membrane Materials for Fuel Cells via ATRP

Ivan Tolstobrov*
Mr.
Institute Chemistry and Ecology, Vyatka State University, Russian Federation

Andrei Bushuev
Mr.
Institute Chemistry and Ecology, Vyatka State University, Russian Federation

Sergey Fomin
Prof.
Vice-Rector for International Affairs, Vyatka State University, Russian Federation



The proton exchange membrane (PEM) is the crucial component of a fuel cell that serves as both a separator and an electrolyte. Due to its difficult operating conditions and functions, PEM material requires a combination of unique chemical and physical properties: mechanical strength and dimensional stability, long-term chemical and electrochemical resistance, and consistently high proton conductivity under various operating conditions. The most suitable materials for these requirements are fluoropolymers. Grafting of polymer side chains to fluoropolymers by atom transfer radical polymerization (ATRP) followed by sulfonation of aromatic sites will give the graft copolymers characteristics suitable for use in various electrochemical systems. For the graft, we chose styrene, a convenient monomer with sulfonation reaction centers. Post-sulfonation is widely used as one of the synthetic methods for preparing PEM due to its convenience and efficiency. In this study polystyrene was grafted to the industrial (VDF-co-CTFE) copolymer by ATRP.

Keywords: Fluoropolymer, ATRP

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Obtaining Copolymers of Vinylidene Fluoride and Hexafluoropropylene with a High HFP Content

Andrei Bushuev*
Mr.
Institute Chemistry and Ecology, Vyatka State University, Russian Federation

Ivan Tolstobrov
Mr.
Institute Chemistry and Ecology, Vyatka State University, Russian Federation

Oleg El`kin
Assoc. Prof.
Institute Chemistry and Ecology, Vyatka State University, Russian Federation

Sergey Fomin
Prof.
Vice-Rector for International Affairs, Vyatka State University, Russian Federation

Copolymers based on vinylidene fluoride (VDF) and hexafluoropropylene (HFP) are promising materials with a number of unique properties; however, the preparation of VDF-HFP copolymers with a high HFP content in their composition is difficult due to the high inertness of the latter. Thus, the conditions for the synthesis of VDF-HFP copolymers with an increased HFP content were selected in this work, the samples obtained were studied by gel permeation chromatography, differential scanning calorimetry, and IR spectrometry. The chemical composition of the obtained polymers was confirmed, corresponding to the form - (CH_2-CF_2) n- (CF_2-CF (CF_3)) m-. The molecular weights and molecular weight distribution of the obtained samples we re measured and it was shown that the synthesized copolymers are suitable for extrusion processing.

Keywords: Vinylidene Fluoride, Hexafluoropropylene, Radical Polymerization

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Evaluation of Antioxidant Properties of Seaweeds from Çanakkale, Turkey

Gülen Türker*
Assoc. Prof.
Faculty of Applied Sciences, Department of Food Technology, Çanakkale Onsekiz Mart University, Turkey

Ilknur Ak
Prof.
Faculty of Marine Sciences and Technology, Department of Aquaculture, Canakkale Onsekiz Mart University, Turkey

Seaweeds are both ecologically and economically important macro-organisms. They provide sheltering, feeding, and breeding areas of other organisms and they also play the important role of carbon sequester. Besides these unique properties, they have valuable polysaccharides such as agar-agar, carrageenan, and alginate. They also contain substances that show antioxidant properties such as phenolics, flavonoids, and condensed tannins. In this study, we present an overview of literature antioxidant capacities, total phenolic and flavonoid contents of seaweeds distributed in Çanakkale, Turkey. Nine seaweed species were studied in this region are Ceramium rubrum, Gracilaria verrucosa, Syctosiphon lomentaria, Cystoseira barbata, Padina pavonica, Enteromorpha intestinalis and Codium tomentosum. According to the literature, the highest inhibition rate was found in P. pavonica. The lowest inhibition was also found in G. verrucosa. The total phenolic content of algae varied between 760.00±3.17 (P. pavonica) and 1.19±0.02 (C. sinuosa) mg GAE/g Ext. The total flavonoid contents of seaweeds from highest to lowest ranked as E. intestinalis>S. lomentaria>C. tomentosum> P. pavonica>C. rubrum>C. barbata>C. tomentosum>C. sinuosa>G. verrucosa. According to literature, it was determined that seaweeds which is distributed in Çanakkale are rich in antioxidant contents.

Keywords: Çanakkale, Seaweed, Antioxidant Capacity, Phenolics, Flavonoids

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Investigation of Antibacterial Effects of Streptomycin Sulfate-Loaded PMMA/PEO/Bis-Chalcone Derivatives-Based Fibers

Kadınşah Nur Koçer*
Mrs.
Chemistry Department, Süleyman Demirel University, Turkey

Neslihan Nohut Maşlakci
Dr.
Department of Pharmacy Services, Isparta University of Applied Sciences, Turkey

Esin Eren
Dr.
Chemistry Department, Süleyman Demirel University, Turkey

Halime Çevikbaş
Dr.
Department of Biology, Süleyman Demirel University, Turkey

Seyhan Ulusoy
Prof.
Department of Biology, Süleyman Demirel University, Turkey

Abdullah Biçer
Dr.
Chemistry Department, Akdeniz University, Turkey

Günseli Turgut Cin
Prof.
Chemistry Department, Akdeniz University, Turkey

Ayşegül Uygun ÖKsüz
Prof.
Chemistry Department, Süleyman Demirel University, Turkey

In this study, fibers were obtained by electrospinning technique to increase the bioavailability of biocompatible polymethyl methacrylate (PMMA)/polyethylene oxide (PEO)/bis-chalcone derivatives ((2E,6E)-2,6-bis(4-nitrobenzylidene)cyclohexanone and (2E,6E)-2,6-bis[(thiophen-2-yl)methylene]cyclohexanone) containing Streptomycin sulfate as a model drug in two different ratios (30 and 60 mg). The antibacterial effects of drug-containing and non-drug fibers against Bacillus cereus and Escherichia coli were investigated. As a result, it was observed that the drug-free fibers did not have any antibacterial effect, while the drug-containing fibers completely destroyed B. cereus and E. coli. Our findings can provide insight into new fibers prepared with antimicrobial compounds for wound dressing applications.

Keywords: Pmma, Peo, Fiber, Antibaacterial, Bis-Chalcone,

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Electrospinning of Polyethylene Oxide/Graphene-Lithium perchlorate As a Potential Lithium Polymer Electrolytes

Yunus Emre Bulbul*
Ph.D. Student
Department of Chemistry, Suleyman Demirel University, Turkey

Esin Eren
Dr.
Department of Chemistry, Suleyman Demirel University, Turkey

Aysegul Uygun Oksuz
Prof.
Department of Chemistry, Suleyman Demirel University, Turkey

The development of lithium-ion conducting solid polymer electrolytes is of current interest for portable devices and electric vehicles [1,2]. Electrospinning has been classified as a versatile method for the fabrication of highly porous membranes containing high surface-to-volume ratio nanofibers. Recent researches compared the polymeric films with the electrospun membranes and showed the superior ionic conductivity of the electrospun membranes [3,4]. The highly porous structure of the nanofibers facilitates ion path and enhances ion conduction. Therefore, the electrospun structures can be great candidates as solid polymer electrolytes in lithium-ion batteries. In this study, all-solid-state polyethylene oxide (PEO)-graphene-based nanofibrous electrolytes were fabricated by using an electrospinning method. $LiClO_4$ was applied as lithium salt and the effect of $LiClO_4$ concentration (0, 5%, and 20% wt.) was studied on the characteristics of the as-spun electrolytes. Scanning electron microscopy/energy dispersive X-ray spectrometry (SEM/EDS), porosity, and Fourier transform infrared spectroscopy (FTIR) analysis were applied to investigate the effect of $LiClO_4$ concentration. Impedance spectroscopy was conducted at room temperature on the resulted electrospun electrolytes.

Keywords: Electrospinning, Nanofibrous Electrolyte, Li-ion Battery, Graphene, Solid Polymer Electrolyte, Polyethylene Oxide

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Synthesis and Characterization of Benzenesulfonimide Substituted Proton Conductive Polyphosphazenes

Elif Büşra Çelebi*
Dr.
Department of Chemistry, Gebze Technical University
Turkey

Rumeysa Baran
Master Student
Department of Chemistry, Gebze Technical University
Turkey

Ferda Hacıvelioğlu
Prof.
Department of Chemistry, Gebze Technical University
Turkey

Fossil fuels are the main energy sources of the world. In addition to the decrease in fossil fuel reserves, the polluting effect of atmosphere by harmful gases released during their use increases the need for environmentally friendly and sustainable energy sources. Polymer electrolyte membrane fuel cells (PEMFC) are considered as one of the most important clean energy conversion systems due to their high power and energy density. The membrane material, which is one of the most important part of the PEMFCs, should be resistant to high oxidative conditions as well as having a sufficient proton conductivity. Perfluorosulfonic acid (PFSA) membranes, e.g., Nafion, have been chosen as the standard due to their high mechanical strength, high proton conductivity, excellent chemical and thermal stability which are the requested properties to provide high performance for PEMFCs. On the other hand, environmental concerns, high fuel diffusion, loss of ionic conductivity at high temperatures and high cost due to high fluorine content are just a few of the disadvantages of PFSAs [1]. For this reason, studies on alternative membrane materials that can be recycled without releasing CFC gases, which can provide high proton conductivity at high temperatures have accelerated in recent years. Polyphosphazenes, which contain sequential P and N atoms in their main chain, are one of the most important inorganic polymers. Sulfonic and phosphonic acid functional polyphosphazenes have similar proton conductivity to PFSA membranes, while also providing lower fuel crossover and lower water swelling properties [2]. Moreover, since the degradation products of the polyphosphazene backbone are mainly H_3PO_4 and NH_3, they can be recycled without the release of harmful CFC gases compared to PFSA membranes [3]. In this study, a series of new polyphosphazene derivatives, which are halogen-free and substituted with benzenesulfonamide group, were prepared and their structures were elucidated by spectroscopic methods.

Keywords: Polyphosphazene, Sulfonimide, PEMFC

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V. International ISCMP TURKEY 2021
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Surface Modification of Silica with Enzyme Catalyzed Reaction

Merve Danisman*
Ph.D. Student
Bayramiç Vocational School, Chemistry and Chemical Processing Technologies, Canakkale Onsekiz Mart University, Turkey

Ayhan Oral
Prof.
Department of Chemistry, Canakkale Onsekiz Mart University, Turkey

Silica is one of the most attractive nanoparticles because it has many advantages such as non-toxic, biocompatible, relatively inexpensive, high thermal resistance, and especially being able to strengthen the mechanical properties of polymer matrices. Due to these properties, it has been frequently used in surface modification studies recently. In generally, chemical methods are used for surface modification of inorganic particles such as silica. However, there is a possibility that these methods may contain chemical contamination. Therefore, it is aimed to develop a reliable alternative process for surface modification by using enzymes. For this purpose, surface modification of silica was performed by binding of methacrylic acid (MAA) with enzyme catalyzed reaction to silica surface. Modified silica particles have been characterized by Fourier Transform Infrared Spectrophotometer (FTIR), Scanning Electron Microscope (SEM) and Thermogravimetric Analysis (TGA).

Keywords: Surface Modification, Enzyme, Silica, Lipase

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Heavy Metal Presence in the Dairy Products Collected from Vicinity of Power Plants (Kosova A and B) in Kastriot

Mentor Ismaili*
Ph.D. Student
Food Technology, Faculty of Biotechnical Sciences,
St. Kliment Ohridski - Bitola, Macedonia

Avni Berisha
Assoc. Prof.
Department of Chemistry, University of Prishtina,
Kosovo

Dzulijana Tomovska
Prof.
Food Technology, Faculty of Biotechnical Sciences,
St. Kliment Ohridski - Bitola, Macedonia

Dairy products must be free of physical, biological, and chemical contaminants in order to be safe for food consumption. Heavy metals: lead, mercury, cadmium, zinc, copper, arsenic, iron and chromium comes via water, grass, feed additives, pharmaceuticals, and farm equipment. Contamination of milk and dairy products can impact food quality and safety. This study compares heavy metal contamination in cream, cheese and yogurt samples collected from local traditional farmers in the region of Kastriot (Obiliq). Microwave digestion system was used for sample preparation prior to their analysis. The analysis of heavy metals was performed using plasma atomic emission spectroscopy (ICP-AES) technique. Dairy products must be free of physical, biological, and chemical contaminants in order to be safe for food consumption. Heavy metals: lead, mercury, cadmium, zinc, copper, arsenic, iron and chromium comes via water, grass, feed additives, pharmaceuticals, and farm equipment. Contamination of milk and dairy products can impact food quality and safety. This study compares heavy metal contamination in cream, cheese and yogurt samples collected from local traditional farmers in the region of Kastriot (Obiliq). Microwave digestion system was used for sample preparation prior to their analysis. The analysis of heavy metals was performed using plasma atomic emission spectroscopy (ICP-AES) technique.

Keywords: Dairy products, Kosovo, Heavy Metals, ICP-AES, Lead, Contamination

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Effect of Gamma-Irradiation on Piperine Content Determined by TLC and UV Spectrophotometry Methods

Nora Limani Bektashi*
Ph.D. Student
Faculty of Technological Sciences, "Mother Teresa" University, Macedonia

Irina Mladenoska
Prof.
Faculty of Technology and Metallurgy, Ss. Cyril and Methodius University, Macedonia

Ivana Sandeva
Dr.
Faculty of Electrical Engineering and Informational Technology, Ss. Cyril And Methodius University, Macedonia

Olga Popovska
Prof.
Faculty of Technological Sciences, "Mother Teresa" University, Macedonia

Kiril Lisickov
Prof.
Faculty of Technology and Metallurgy, Ss. Cyril and Methodius University, Macedonia

Arianit A. Reka
Prof.
Faculty of Natural Sciences and Mathematics, University of Tetovo, Macedonia

Darko Dimitrovski
Prof.
Faculty of Technology and Metallurgy, Ss. Cyril and Methodius University, Macedonia

Slobodan Masic
Mr.
Department of Radiation Chemistry and Physics, Vinca Institute of Nuclear Sciences, Serbia

Monika Stojanova
Dr.
Faculty of Agriculture, University of Belgrade, Serbia

Hristina Spasevska
Prof.
Faculty of Electrical Engineering and Informational Technology, Ss. Cyril and Methodius University, M acedonia

Black pepper is the most important and most widely used spice in the world. The components contributing to its value are the alkaloids, of which piperine is the major bio-active component of pepper which imparts pungency and biting taste to it. Piperine has numerous demonstrated health effects and beneficial therapeutic properties. The purpose of this research was to investigate the effects of different doses of ionizing radiation on the content of piperine in irradiated black pepper (Piper nigrum) and compare it with the unirradiated control sample. Samples were irradiated with Cobalt-60 gamma-rays (at absorbed doses of 0.5 kGy, 1 kGy, 3 kGy, 5 kGy, 7 kGy, 10 kGy and 12 kGy). Combining the methods, TLC (samples were dissolved in methanol) and UV-Vis spectrophotometry at 342 nm against methanol as blank, piperine content in the samples was identified. TLC was performed in three mobile phases (1.toluene: ethyl acetate, 7:3 v/v; 2. aceton: n-heksane, 6:4 v/v; 3. toluene: methanol, 8.5:1.5 v/v) and the retention factor (RF) value for piperine was equal to 0.66, 0.94 and 0.67, respectively. The absorption maximum of piperine solution in methanol (unirradiated control sample), 2.01 microgram/mL was recorded at 342 nm against methanol as a blank sample. The % w/w content of piperine in the samples preparations of black pepper was found to be between 0.04 and 1.05 for piperine gamma-irradiated samples. The impact of gamma-irradiation has not been observed to decrease significantly the piperine content in the irradiated samples.

Keywords: Gamma-irradiation, Piperine, Black Pepper, Thin-layer Chromatography (Tlc), Uv-vis

Spectrophotometry, Food

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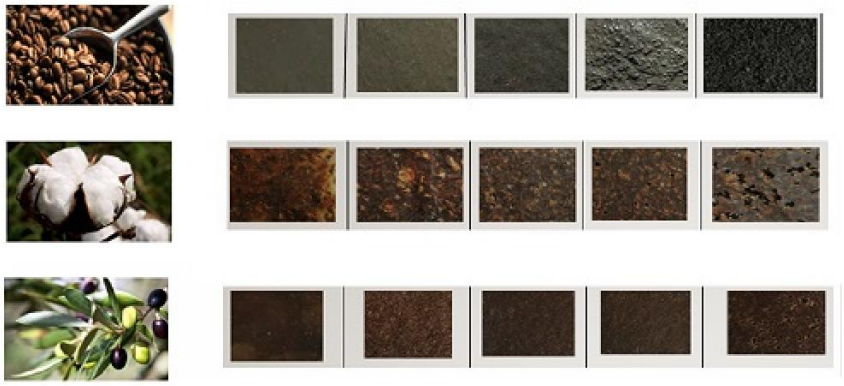
Polymeric Composite Materials based on Natural Waste Seeds and their Physical Properties

Zeynep Asena Karatekin
M.Sc. Student
Department of Chemistry, Ege University, Turkey

Berna Körpınar
Ph.D. Student
Department of Chemistry, Manisa Celal Bayar University, Ege University, Turkey

Hakan Akat*
Assoc. Prof.
Department of Chemistry, Ege University, Turkey



In this study, the physical properties of composites obtained using different ratios of unsaturated polyester and epoxy vinyl ester resins with natural waste seed were investigated. Composites were formed using waste coffee beans in different proportions of 10%, 20%, 30%, 40%, and 50% by mass. Based on Styrene unsaturated polyester and epoxy vinyl ester resins were used as resins. Hand laying technique was used to form the samples. The coffee wastes were first milled, passed through a 500-micron sieve, then combined with resin, and poured into molds. After curing in an oven at a temperature of about 70 0C, various tests were performed to examine its properties. The obtained composites were subjected to density, hardness, high-speed impact strength, thermal gravimetric analysis, and SEM analyses were performed. According to the thermal gravimetric analysis results; In general, the higher the fiber ratio, the lower the thermal stability. Investigating the energy absorption properties of composites, it was observed that coffee with a 20% ratio showed better properties for the styrene unsaturated polyester composite group. Epoxy vinyl ester group composites showed similar strength with polyester group composites due to the dispersed fiber structure of the reinforcement phase. In this study, alternative raw materials to be used in industrial production have been revealed and within the framework of social responsibility, the raw materials that are waste are recovered and provided added value.

Keywords: Coffee Waste Seeds, styrene-based unsaturated polyester resin, epoxy vinyl ester resin, Natural Composites

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1.Introduction

It is an important advantage to find alternative raw materials to be used in industrial production, reduce costs, and recycle waste. The search for new and environmentally, friendly raw materials for the industry is rapidly spreading with the increase in consumption. Especially in line with the precautions taken against environmental pollution, which has attracted attention on a global scale, the transformation of the waste product becomes very important. The recovery of waste goods is important for environmental awareness and social responsibility. Thus, more durable environmentally-friendly structures will be formed at lower costs. In line with the data obtained, it is expected to provide new business lines and employment as well as ecological contribution. Natural fiber-reinforced materials are intensively studied due to their environmental sensitivity and unique properties. Working with natural fibers is easy to supply, sustainable and economical, simple, and safe to use. Recently, developments in the composite have brought new searches with the increase in environmental concerns, problems such as sustainability, and cost. Research in production has focused on biomaterial technology with promising opportunities. This field attracts the attention of many researchers due to its important features such as the ease of disposal and the expiration date of the materials forming the composite. The expiration date is important because it can be an important problem for many synthetic raw materials. Compared to synthetic fibers, natural fibers have advantages such as low weight, corrosion resistance, and high strength, making biocomposites more advantageous. However, biocomposites have some disadvantages, such as anisotropic and extra moisture absorption[1]. Biocomposites containing natural fiber can achieve this at an affordable cost-performance ratio to compete with petroleum-based materials and maintain a positive balance between ecology, economy, and technology. It creates an opportunity for petroleum-based composite materials to be replaced with natural fiber containing and ultimately to replace them with new agricultural, environmental, production, and consumer benefits[2]. Natural fiber-reinforced polymeric composites have been used in a wide variety of industrial applications recently. Since they are easily available and sustainable, most polymeric composites use natural fibers and natural additives as reinforcing materials. When the effect of polyester composites filled with palm kernel powder on the tribological behavior is examined, the friction coefficient decreases by 15% with the increase of filler under high contact pressure, while the speed increase increases the friction coefficient by up to 10%. The applied load (contact pressure) and sliding speed have a significant effect on the wear rate of the polyester composite filled with palm kernel[3]. A similar study with palm seeds was done by adding 1%, 2%, and 3% by weight instead of calcium carbonate to naturally contribute to unsaturated polyester resin. It has been observed that samples containing palm seeds have a higher resistance load compared to samples containing calcium carbonate, and this increase in tensile strength increases with palm seeds and their mechanical properties improve[4]. It shows that in composite samples obtained using olive and palm kernels and epoxy resin, the thermal and water absorption properties increase as they increase the weight fraction of the particles. In addition, higher thermal conductivity, thermal diffusion, specific heat, and water absorption values were found for samples strengthened with olive seeds (18% by weight) and grain size (300 ?m)[5]. In the study conducted with pineapple fibers (PALF), promising studies are carried out in the making of tools and equipment used in our daily lives in composites made with fibers. PALF is generally used in yarn making for textile fabrics for several decades. The PALF application available for various purposes are textiles, sports equipment, luggage, cars, cabinets, mats, and the like. Surface-modified PALF has been introduced to make machine parts such as belt cords, conveyor belt cords, transmission cloth, airbag bonding cords, and some clothes for industrial use[6]. A similar study was carried out with Borassus seed fibers, palm tree fiber. Various analyzes have been carried out for composites formed with natural Borassus seed fiber as a reinforcing phase; composites with a fiber content ranging from ~ 0.116 to ~ 0.305 in volume; In all cases, the change of mechanical properties such as stress, bending, and impact properties were examined. It has been stated that the tensile and bending strength of the Borassus seed sprouted fiber composite increased respectively

compared to the pure matrix. In addition, decreases in the density of composites were found with increasing fiber ratios [7]. In a 2014 study, tensile strength and abrasion of composites in an experimental study to investigate the tensile and wear properties of polymer composites formed by reinforcing Calotropis Gigentea (silk grass) fruit fiber to polyester resin as a new natural fiber. It is stated that its behavior increases in direct proportion with the amount of fiber found in the material. Thus, it was found that the composites of Calotropis gigantea fruity fiber-polyester composites are lightweight, have better mechanical and abrasion properties. This suggests that natural fiber-reinforced plastic composites have the potential to replace synthetic fiber composites in many applications[8]. In another study, the results of thermal expansion were examined in the composite formation made by using different amounts of peanut shell wastes and epoxy resin, and it was stated that it could be used successfully in many applications by developing a useful compound to replace wood-based panels[9]. In a different study with coconut waste, in principle, it was found that polyester composites reinforced with coconut fiber could technically replace wooden boards or gypsum panels depending on the amount of fibers combined[10]. The effect of oil extraction is used and ground waste coffee on the properties of used coffee ground-polypropylene composites; Oil extraction has been thought to help improve interfacial adhesion and compatibility between the filler and the PP matrix. The moisture absorption of the composite showed a dramatic decrease after oil extraction. The results also revealed that oil extraction improves the thermal properties of the composite[11]. In composite studies carried out with fiber samples obtained from the Sisal plant, it was determined that their tensile, bending, and impact strengths and strength properties increased. According to the findings of the study, composites prepared with sisal plants can be used in areas such as the building industry and automotive industry[12]. For the findings obtained for pistachio shell powder and polyester matrix composites; Although significant losses in mechanical properties are found in high particle content, it has been concluded that the production of environmentally friendly and low-priced particle polymer composite can be considered as the benefits of using peanut shell as a particle filler[13]. In this study, we choose epoxy vinyl ester and Styrene-based unsaturated polyester because it is commercial and inexpensive and to create new types of composites for various industrial applications such as aerospace, coating industry, marine and construction, natural fiber reinforced polymer composites are obtained by using wastes of coffee, olive, and cotton plants, which are natural fiber in different proportions (10%, 20%, 30%, 40%, and 50%). intended to be. As a resin, styrene-based unsaturated polyester and Bisphenol-A-based epoxy vinyl ester were used.

2.Materials and Methods

Styrene-based unsaturated polyester resin: Poliya brand Polipol 357-C (6% Co-doped, density 1.06-1.65 g / cm3) Epoxy vinyl ester resin with Bisphenol A content: Poliya brand Polives 701- TA (6% Co added, density 1,044 g / cm3). Methyl ethyl ketone peroxide (Promox brand, Promox P211TX) Waste coffee bean: Arabica coffee bean of Ethiopian origin; The remaining wastes have been used from the espresso machine. Waste olive kernel: obtained from olives in Akhisar region in TURKEY. Core waste, which is the last waste of pina, is used. Waste Cotton seed kernel: Cottonseed waste obtained from in Söke region in TURKEY. The coffee and olive seeds used in the experiment were sieved through a 500-micron sieve and the grains were used as a reinforcement phase in composite production. Cotton core, on the other hand, was used directly in composite production. Instrumentation In this study, the physical properties of waste seeding and composites with epoxy and unsaturated polyester have been investigated using the Hand layup technique[14]. TGA measurements of composites were made on Perkin Elmer Diamond TA/TGA between 30 and 600 °C with the heating speed at 10 °C/min under the nitrogen atmosphere. Sample weights were taken between 9-10 mg. SEM images obtained 6.0 mm using an area emission-scanning electron microscope. Hardness values of composites were measured in Shore D by Zwick / Roell Shoremeter. The density of obtained composites were measured by a 25 ml pycnometer. Composite Preparation In this study, olive kernel pulp that is waste as natural fiber, coffee bean

pulp, and cotton pulp were used. Coffee, olives, and cotton cores are finely ground and passed through a 500-micron sieve. Chemical content of Coffee waste, being lignocellulosic biomass, which is mainly composed of the essential life elements (C, H, O, and N), which are primarily forming cellulose (59.2?62.94 wt%), hemicellulose (5?10 wt%), and lignin (19.8?26.5 wt%)[15]. Olive seed structure also contains plenty of cellulose[16] and cottonseed contains cellulose and Cottonseed oil which has a ratio of 2:1 of polyunsaturated to saturated fatty acids and generally consists of 65?75% unsaturated fatty acids including 18?24% monounsaturated (oleic), 42?52% polyunsaturated (linoleic), and 26?35% saturated (palmitic and stearic)[17]. After purification, moisture was blown out in the oven. Ready vegetable waste samples to be 10%, 20%, 30%, 40%, and 50% by mass It was mixed with the Styrene-based unsaturated polyester resin and Epoxy vinyl ester resin with Bisphenol A for an average of 20 minutes. Mixing process Methyl ethyl ketone peroxide solution was added as catalyst followed by 10 minutes further processing continued. 10 cmx10 after mixing is completed Pour into molds of cm, and then It is allowed to cure for 6 hours under standard at 70 0C for each sample. Hardness to composites prepared for analysis after curing process, density, high-speed impact test, SEM, and thermal gravimetric analysis tests was done. 3.Results and Discussion Hardness tests It was observed decreases in hardness values as the amount of fiber increases values and graphs of composites separated by groups shown in Table 1. From the findings obtained, it was observed that the mechanical properties of the samples changed as the fiber ratio increased (from 10% to 50%). Decreases were found in the stiffness values with an increase in the overall fiber ratio. Small increases and decreases in the values of coffee (CCC), cotton (OCC), and olive (COCC) composites are due to the heterogeneity of the structures. The reason for the higher stiffness of cotton composites is due to the fiber structure. The wetting of the cotton fiber and the absorption of the resin have made the surface and structure of the composite samples harder (Table1). In addition, since the cotton fiber contains oil, it has increased the possibility of crosslinking with the resin and is thought to provide faster curing. Density and SEM measurements Density determinations of Styrene-based unsaturated polyester-waste coffee core (SCCC), olive core (SOCC), cotton core (SCOCC) fiber composites and Bisphenol A-containing epoxy-vinyl ester-waste coffee core (ECCC), olive core (EOCC), cotton core (ECOCC)fiber composite (EC) samples were performed using a Pycnometer. The values and graphics obtained in Table 2 are given. In addition, densities were observed to decrease with increasing fiber ratio. In the study of Raghu and Goud, he emphasized that the density of the silk-epoxy composites caused the decreases between the particles and the structure. This situation is noticeably observed in SEM images as well as affecting the masses of composite samples. With the increase in fiber ratio in the images taken in 5 micro sizes with Scanning Electron Microscope (SEM); microcracks, cross-link breaks, and building defects appear to be significantly increased (Figure 1-2-3-4-5-6). High-Speed Impact Test Results For composites with an average wall thickness of approximately 5 mm, using the Fractovis Plus impact tester, high-speed impact strengths with 12.7 mm tip and 20 J energy were examined according to ASTM D 3763 standard. The maximum contact that the tip can withstand is 22.5 kN. Impact test results related to strength values; It becomes clear when we examine the velocity-time (v-t), Force-time (F-t), Crash-time (d-t), Force-Crash (F-d), and Energy-time (E-t) graphs. All parameters are evaluated within themselves. It was observed that epoxy vinyl ester and unsaturated polyester group composites did not create very strong structures in terms of strength for Force-time, slump-time, and force-slump values under load. The open curves in the slump graphs and the continuity of the curves parallel to the bed indicate that the damage caused by the composites is high. Therefore, it was concluded that composites do not form strong structures in terms of strength for force-time, slump-time, and force-slump values. In particular, the peaks in the collapse graphs are the most obvious indicator of the friction force formed. In addition, the uneven fiber distribution of the reinforcing phase causes the force lines that the striking tip transfers to the sample surface to change direction and increase the tension on the surface. As a result, composites under the force of collapsing, puncture, stub, and breakage, etc. occur. The velocity-time graphs show the effects of the striker and the sample during impact, and the negative curves indicate the presence of back bounces and the resulting friction force.

Composites were compared among themselves to absorb energy. For the styrene-based unsaturated polyester composite group, 20% fiber and coffee and 30% cotton samples were observed to have better properties. It was concluded that in the epoxy vinyl ester group with bisphenol-A content, 20% ECCC, 30% ECOOC, and EOCC samples had better absorption property of incoming impact energy. Epoxy vinyl ester group composites showed similar strength properties with polyester group composites due to the dispersed fiber structure of the reinforcing phase. High adhesion and fast hardening effects of epoxy vinyl ester composites can be easily understood from the graphic values of composites containing olive. The fact that bisphenol A containing epoxy vinyl ester resin has higher impact resistance and fiber-holding properties than styrene-based unsaturated polyester, has not been reflected in the strength properties due to the random distribution of the reinforcement phase in the composite. When we compare the materials among themselves, it does not provide certainty in terms of having good energy absorption properties and good strength properties. One of the most obvious examples observed during the experiments is that 40% of cotton composites do not have a complete breakdown during material puncture. The increase in the fiber ratio indicates that the energy coming with the impact force is absorbed by transferring to the fiber, particles, and spaces in the material. The idea of usability of the so-called structural flaw was reached. It is thought that the production technique can be changed for the related composites and it can be used in the production of new materials especially in sound insulation or thermal insulation when more sensitive methods are used. The absorbed energy was calculated from the area under the force-slump (F-d) curve. If the batter bounces back from the sample surface, all of the energy of the batter cannot be absorbed by the sample, and the non-absorbable impact energy is also used to bounce the batter from the sample surface. If the striker strikes the sample, all of the impact energy it possesses is absorbed by the sample and the last part of the curve continues almost horizontally, as seen in figure 7-8-9. While the amount of fiber absorbed from the related graphics is expected to increase, the energy absorbed will increase; In some data, healthy data could not be obtained due to hetoregenicity. Here, in terms of the absorbed energy, SCCC and ECCC composites, which are 20% when composites are evaluated among themselves, showed better properties than other samples. SOCC and EOCC samples with 10% fiber ratio were seen in the rebound energy and the presence of friction forces. SOCC with 20% fiber content and EOCC samples with 30% fiber ratio were observed to better absorb incoming impact energy. It was observed that SCOCC and ECOCC group samples having 30% fiber ratio absorb energy better than others. For other samples, the impact of the striker's speed to be opposite to the impact direction, the rebound bounce, and the effect of friction force due to stub were observed. In line with the findings, it was observed that the values of the samples changed as the fiber ratio increased (from 10% to 50%). The reason for the higher hardness of cotton composites is due to the fiber structure. Due to the cotton fiber's ability to wet and absorb the resin, the surface and structure of the composite samples showed a harder feature. In addition, it was thought that the oily structure of the cotton fiber increased the possibility of cross-linking with the resin and faster curing by providing integrity. It was observed that the density of the composites decreased as the fiber ratio increased. TGA investigation Composite samples were examined with TGA using 8-10 mg samples at a temperature of 25 oC and 600 oC at 20 0C / min heating rate and inert nitrogen gas atmosphere. Mass losses due to temperature increase were examined. From the mass loss-temperature graphs obtained, it was determined that bond breakage occurred. It was observed from the graphs that the thermal decomposition temperatures decreased (figure 10). According to the results of thermal gravimetric analysis; In general, as the fiber ratio increases, thermal stability decreases. The high content of cellulose and lignin in natural fiber-reinforced composites reduces the thermal decomposition temperature. When the graphs are examined, it is seen that as the amount of fiber increases between 20-600 0C, the decomposition temperature decreases, and the amount of residue increases for 5% degradation. Thermal decay values of polyester and epoxy samples without fiber content in TG curves are higher than those with waste fiber additives. The graphic and thermal trends of the obtained values are similar to the values of jute-unsaturated polyester and jute-epoxy composite samples in the literature[18]. The mineral presence in the fiber in the

reinforcement phase also affected the amount of residue. In addition, the 6% cobalt additives of the composites forming the composites are noticeably noticeable as residues in thermogram values. When unsaturated polyester and epoxy vinyl ester samples are compared, it is seen that epoxy vinyl ester composites occur at higher thermal degradation due to the crosslinking between resin and cores.

4.Conclusion

s In this study, the physical properties of epoxy and unsaturated polyester-based composites created by using the hand layup technique using waste seeds were investigated. Hardness, density, high-speed impact, SEM, TGA analyzes were performed. In line with the findings, it was observed that the values of the samples changed as the fiber ratio increased (from 10% to 50%). According to the thermal gravimetric analysis results; In general, the higher the fiber ratio, the lower the thermal stability. The high cellulose and lignin contents of natural fiber-reinforced composites reduce the thermal decomposition temperature. When the graphics were examined, it was seen that as the amount of fiber increased between 20-600 0C, the degradation temperature decreased and the residue amount increased. Thermal degradation values of unsaturated polyester and epoxy samples without fiber content in TG curves are higher than those with waste fiber additives. Comparing the energy absorption properties of composites, it was observed that coffee and olive with 20% fiber ratio and 30% cotton fibers showed better properties for the styrene unsaturated polyester composite group. In the bisphenol A containing epoxy vinyl ester group, it was concluded that 20% ECCC, 30% ECOOC and EOCC composites have better absorption of impact energy. Epoxy vinyl ester group composites showed similar strength with polyester group composites due to the dispersed fiber structure of the reinforcement phase. The high adhesion and fast curing property of epoxy vinyl ester composites are reflected in the graphic values of single olive-containing composites. Bisphenol containing epoxy vinyl ester resin has been observed to show higher impact resistance compared to unsaturated polyester. Funding The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the Scientific research project Foundation of Ege University (FYL-2019-20643) Compliance with ethical standards Conflict of interest The authors declared no potential conflicts of interest concerning the research, authorship, and/or publication of thisArticle 5.

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Effect of Infusion Time on the Phenolic Content and Free Radical Scavenging Capacity of Olive Leaf Tea

Tulay Tutenocakli*
Dr.
Department of Plant Production and Animal Husbandry Lapseki Vocational College, Çanakkale Onsekiz Mart University, Turkey

Gulen Turker
Assoc. Prof.
Department of Food Technology, Çanakkale Faculty of Applied Sciences, Çanakkale Onsekiz Mart University, Turkey

Nazan Arifoglu Sen
Dr.
Department of Food Technology, Çanakkale Faculty of Applied Sciences, Çanakkale Onsekiz Mart University, Turkey

Yalcin Coskun
Assoc. Prof.
Department of Plant Production and Animal Husbandry Lapseki Vocational College, Çanakkale Onsekiz Mart University, Turkey

Olive leaf tea is traditionally used in folk medicine, especially in the Mediterranean region. It has been used for a long time as antidiabetic and antihypertensive herbal drug. Research on the health effects of olive leaf preparations and extracts has revealed that olive leaves have antimicrobial, antioxidant, hypoglycemic, hypocholesterolemic, and anti-atherosclerotic effects. All these positive effects are associated with the content of bioactive compounds such as phenolics, flavonoids, tannins, and steroids present in olive leaves. A number of studies have shown that the bioactive compounds content may vary depending on the cultivar, climatic conditions, as well as the way of tea infusion preparation. Therefore, in the present study, the effect of infusion time on the phenolic, flavonoid, and radical scavenging capacity of olive leaves from 3 different olive cultivars (Ayvalik, Gemlik, and Kalamata) was investigated. The infusions were prepared with ground olive leaves that were immersed in deionized boiling water for 1, 3, and 5 minutes. The total phenolic content of the infusions was in the range between 8.03 and 9.81 mg gallic acid equivalent / g dry leaves. The total phenolic content of the infusions of Ayvalik and Kalamata leaves significantly increased with increasing infusion time ($p<0.05$). On the other hand, the total flavonoid content of the infusions varied from 4.36 to 4.92 mg rutin / g dry leaves, though no statistical difference was detected for all preparations. The evaluation of the total radical scavenging capacity, measured with 2,2-diphenyl-1-picrylhydrazyl (DPPH) method revealed that the radical scavenging activities of the prepared infusions, in terms of IC50 inhibition values, changed from 2.28 to 2.89 µg /ml. Subsequently, it was found out that with increasing infusion time the amount of total phenolics increase in the olive leave tea preparations.

Keywords: Olive Leaves, Infusion Time, Phenolics, Flavonoids, Free Radical Scavenging,

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