BOOK OF ABSTRACT PROCEEDINGS

3rd International Conference on Organic Electronic Material Technologies

(OEMT2018)

Sep 20-22, 2018, İğneada - Kırklareli / TURKEY

FOREWORD

It is a pleasure for us to offer you this Book of Abstract for the 3rd Internatıonal on Organic Electronic Material Technology Conference (OEMT2018). Our goal was to create a platform that introduces the newest results on internationally recognized experts to local students and colleagues and simultaneously displays relevant Turkish achievements to the world. The positive feedback of the community encouraged us to proceed and transform a single event into a conference series. Now, OEMT2018 is honored by the presence of over 120 colleagues from various countries. We stayed true to the original OEMT2018 concept and accepted contributions from all fields of materials science and technology to promote multidisciplinary discussions. The focal points of the conference emerged spontaneously from the submitted abstracts: energy applications, advanced materials, electronic and optoelectronic devices, organic electronic materials, chemistry, physics, environmental science, medical science, applied and engineering science, computer simulation of organic structures, biomedical applications and advanced characterization techniques of nanostructured materials. Further fields of interest include e.g. new advanced and functional materials, advanced-functional composites, biomaterials, smart materials, dielectric materials, optical materials, magnetic materials, organic semiconductors, inorganic semiconductors, electronic materials, graphene, and more. We can offer free publishing of all peer-reviewed proceedings in international journals Materials Science-Poland, Journal of Nanoelectronics and Optoelectronics, Organo Optoelectronics, Journal of Materials and Electronic Devices and provide the participants with all the commodities of a world – class conference.

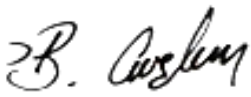
Therefore, we hope that getting first-hand access to so many new results, establishing new connections and enjoying the İğneada, Kırklareli / TURKEY ambience will make you feel that your resources were spent well in OEMT2018.

Our warmest thanks go to all invited speakers, authors, and contributors of OEMT2018 for accepting our invitation, visiting Kırklareli and using OEMT2018 as a medium for communicating your research results.

We hope that you will enjoy the conference and look forward to meeting you again in one of the forthcoming **OEMT2019** event.

Best regards,
Chairmen's of Conference

Asst. Prof. Burhan COŞKUN



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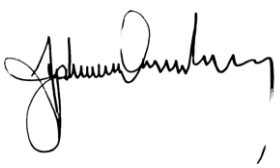

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PROGRAMME
20 SEPTEMBER 2018 (THURSDAY)
HALL 1

08:30-17:30	**Registration (İğneada Resort Otel, Floor 1)**
09:00-09:30	**Opening Ceremony**
09:30-10:30	**Invited Talks (Chair: F. Yakuphanoğlu)**
09:30-10:00	**Invited Talk-1, Y. Yağcı: "Unconventional Polymerization Applications of Conjugated Systems and Nanoparticles"**
10:00-10:30	**Invited Talk-2, S. Güneş: "Organic Photovoltaics: Route to the Photovoltaic Market"**
10:30-10:50	**Coffee Break**
10:50-12:20	**1st session (oral talks) Chair: S. Aközcan**
10:50-11:05	B.E. Kocamaz Özcan, H. Şanlıdere Aloğlu, H. Uran: "Nanotechnology Applications in Food Packaging"
11:05-11:20	H. Uran, H. Şanlıdere Aloğlu: "Usage Possibilities of Biosensors in Food Technology"
11:20-11:35	M. Konak, B. Çetin: " Molecular Methods Used in Microorganism Definition"
11:35-11:50	B. Çetin, M. Konak: "Unconscious Antibiotic Use and Bacterial Antibiotic Resistance Problem"
11:50-12:05	G. Akarken, U. Cengiz: "Fabrication and Characterization of Fire-Resistance Geopolymer Material"
12:05-12:20	G. Akarken, U. Cengiz: "Fabrication and Characterization of Magnetic Nanoparticle-Polymer Composite Materials"
12:20-13:45	**Lunch**
13:45-15:45	**2nd session (oral talks) Chair: N. Akdoğan**
13:45-14:15	**Invited Talk-3: B. Mısırlıoğlu: "Strong Composition Dependence of Resistive Switching in $Ba_{1-x}SrTiO_3$ Thin Films on Semiconducting Substrates and its Thermodynamic Analysis"**
14:15-14:30	C. Karpuzoglu, U. Cengiz: "Investigation And Improvement of Mechanical Deformation Behaviors and Depression Resistance of Concrete Steel Bars"

14:30-14:45	B. Kartal, U. Cengiz: "Production of Polymeric Fiber Reinforced Geopolymer Composite Material"
14:45-15:00	B. Kartal, Ö. Ünzal, U. Cengiz: "Fabrication of Superhydrophobic Surface Using Fluoro-Styrene Copolymers by Spraying Method"
15:00-15:15	F. Semerci: "Enhanced Gas Separation and Storage Properties of Functionalized Metal Organic Frameworks"
15:15-15:30	M. Tercan, O. Dayan: "Tri-Dentate Benzimidazole Type Ligands Bearing Ru (II) Complexes as DSSC Photosensitizers"
15:30-15:45	M. M. A. Usal, M. R. Usal, M. Usal: "Formulation of Linear Constitutive Equations of Thermo-Viscoelastic Medium"
15:45-16:05	**Coffee Break**
16:05-17:50	**3rd session (oral talks) Chair: M. Ateş**
16:05-16:20	S. Eryılmaz: "Theoretical Investigatıon of Nonlinear Optical Properties of Some Bis-Thiazole Derivatives"
16:20-16:35	D. Taşkın Gazioğlu, F. Dumludağ, M. H. Yu. Seyidov: "Effects of Gate Metal on Electrical Characteristics of Bottom-Gate Poly (3-Hexylthiophene) (P3HT) Based Ofet"
16:35-16:50	D. Şenol Bahçeci: "Synthesis and Characterization of Poly (Ether)s Containing Resorcinol Unit"
16:50-17:05	C. Kök, F. Baycan Koyuncu, S. Koyuncu: "Crosslinkable Electroactive Materials for Electronic Applications"
17:05-17:20	H. Kılıç, C. Mısırlı: "Investigation of the Effect of the Coating Performed by Thermal Spraying Techniques on the Automotive Brake Disc"
17:20-17:35	C. Mısırlı, H. Kılıç: "Investigation of the Use of Intermetallic Compounds as Brake Disc Coating Material "
17:35-17:50	O. Koçak, İ. P. Duru, İ. Yavuz: "Investigation of the Molecular Ordering and Charge Transport of Circular-Oligomer/Fullerene Complexes for Solar-Cell"
18:00-19:00	**Poster Session**
19:00	**Gala Dinner**

20 SEPTEMBER 2018 (THURSDAY) **HALL 2**	
10:50-12:20	**1st session (oral talks) Chair: Ö. S. Taşkın**
10:50-11:05	G. Özcan, M. Akçay, Y. Koçak, E. Gülbandılar: "Compressive Strength of Concrete Containing Diatomite under the Effect of Sodium Chloride by Ann"
11:05-11:20	Y. Koçak, M. Savaş: "Effects of Sodium Chloride on Concretes Substituted Zeolite and Diatomite"

11:20-11:35	M. Duman, A. O. Salman: "The Connection Types to Minimize Loss of Gain Between Low Noise Amplifier and Antenna "
11:35-11:50	M. Duman: "Linear Predictive Coding in Matlab to Communicate With Zigbee"
11:50-12:05	M. Ates, O. Kuzgun, M. Yildirim, H. Ozkan: "A Ternary Nanocomposites of rGO/MnO_2/PTTh for Supercapacitor evaluations"
12:05-12:20	M. Ates, Y. Bayrak, H. Ozkan, O. Yoruk, M. Yildirim, O. Kuzgun: "Synthesis of rGO/TiO_2/PEDOT Nanocomposites, Supercapacitor Device Performances and Equivalent Circuit Models"
12:20-13:45	**Lunch**
13:45-15:45	**2nd session (oral talks) Chair: Y. Ş. Asar**
13:45-14:15	**Invited Talk-4, T. Asar: "Metal-Semiconductor-Metal Infrared Photodetectors"**
14:15-14:30	A. Gediz Ertürk: "Synthesis, Caracterization, Computational Calculations & Bioactivity of 3-Biphenyl-4-Imino-Sulfahydantoin"
14:30-14:45	I. Kilic, S. G. Gok: " The Effect of Binder Ratio on Mechanical Properties of Khorasan Mortar"
14:45-15:00	S. Poyraz: "One-Step Manufacturing of A Nanostructured Hybrid Electrode Material Via Microwave Energy-Based Approach and its Use in Energy Storage"
15:00-15:15	S.Poyraz:"Microwave Energy-Based Fabrication of Hierarchical Carbon Nanotube/Carbon Fiber Structures"
15:15-15:30	S. Altürk, D. Avcı, F. Sönmez, Ö. Tamer, A. Başoğlu, Y. Atalay, B. Zengin Kurt, N. Dege: "Synthesis, Crystal Structure, Spectral Characterization, α–Glucosidase Inhibition and TD/DFT Study of the Cu (II) Complex"
15:30-15:45	S. Altürk, D. Avcı, F.Sönmez, Ö. Tamer, A. Başoğlu, Y. Atalay, B. Zengin Kurt: "Synthesis, Crystal Structure, Spectral Characterization, α–Glucosidase Inhibition and TD/DFT Study of the Cu (II) Complex"
15:45-16:05	**Coffee Break**
16:05:17:50	**3rd session (oral talks) Chair: H. Kara**
16:05-16:20	C. Apay, Ö. Özkan Önür, A. Bideci: "Civil Architecture of Examples is in Tarakli and Halim Düzgün of Home's Projects and Restoration Studies "
16:20-16:35	B. Kirezli, M. Ahmetoglu (Afrailov), A. Kara: " Electrical and Optical Properties of Photodiode Structures Formed by Surface Polymerization of P(EGDMA VPCA)/SWCNT Films on N-GaAs "
16:35-16:50	E. Baysak: "Double Modification of Romp Polymers Including Pendant Thiolactone Units"
16:50-17:05	E. Baysak, S. Yuvayapan, A. Aydogan, G. Hizal: "Calix[4]Pyrrole-Modified Single Wall Carbon Nanotubes and Acetone Sensing Properties"

17:05-17:20	H. Kırpık, A. Köse, M. Köse:"Two novel fluorescent-based dopamine sensors: Structural characterization and sensing abilities"
17:20-17:35	D. Nartop, E. Hasanoğlu Özkan, G. Ağar, H. Öğütcü, N. Sarı: "Synthesis, Antimcrobial and Antimutagenic Effects of Novel Polymeric-Schiff Bases Including Indol"
17:35-17:50	H. Bodur, G. Ceyhan: "Preparation of Polishing Slurries Containing Al_2O_3 for Chemical-Mechanical Polishing in Metal-Kitchen Equipments"
18:00-19:00	**Poster Session**
19:00	**Dinner**

20 SEPTEMBER 2018 (THURSDAY) HALL 3	
10:50-12:20	**1st session (oral talks) Chair: B. S. Mısırlıoğlu**
10:50-11:05	F. Semerci, K. Günduğar: "A New MOF Based Nanocomposite for Supercapacitor Application "
11:05-11:20	E. Türkeş, M. M. A. Usal: "Balancing the Limb Masses of the Mechanisms"
11:20-11:35	E. Türkeş, M. Şahin, S. Selvi: "Chatter Vibration and Stability Analysis for Orthogonal Cutting in Turning"
11:35-11:50	U. Kamburoglu Cebi, C. Ozcan, M. A. Gurbuz, S. Ozer: "Residue Levels Released in Different Parts of Sunflower of Imazamox Herbicide in Flower Pot Conditions"
11:50-12:05	L.Günaydın, C. Mısırlı, H.Kılıç: "A Novel Rail Bike Design and its Integration to Kırklareli Railway Line "
12.05-12:20	A. Kurtuldu, Z.O. Özdemir, M. Çelebi, F. Semerci, "Covalent Enzyme Immobilization onto Highly Porous Uio-66-NH_2"
12:20-13:45	**Lunch**
13:45-15:30	**2nd session (oral talks) Chair: E. Pelit**
13:45-14:15	**Invited Talk-5, R. K. Gupta: "Photoconductive Schottky Diode Based on Al/P-Si/SnS_2 /Ag for Optical Sensor Applications"**
14:15-14:30	Y. Ünlütürk, Z. A. Karakaş: "On the Spherical Indicatrices of Partially Null Curves in Minkowski Space-Time "
14:30-14:45	Y. Ünlütürk, T. Körpınar: "On the Principal Normal and Trinormal Spherical Indicatrices of a Spacelike W-Curve With Timelike Principal Normal Vector in Minkowski Spacetime "
14:45-15.00	T. Körpınar, Y. Ünlütürk: "On Inextensible Flows of M_2 Bishop Spherical Images According to Bishop Frame in E^3 "
15:00-15:15	**S**. G. Gok, S. Gundogan: "The Effect of Curing Conditions on Mechanical Properties of Alkali-Activated Mortars"

15:15-15:30	S. G. Gok, S. Gundogan: "The Influence of Activator Concentration on Strength Characteritics of Alkali-Activated Slag Mortars"
16:05-17:35	**3rd session (oral talks) Chair: Ş. Karataş**
16:05-16:20	M. Arslan, A. Motallebzadeh, B. Kışkan, A. L. Demirel, I. V. Kumbaraci, Y. Yağcı: "Combining Benzoxazine and Ketene Chemistries for Self-Healing of High Performance Thermoset Surfaces"
16:20-16:35	C. Demirel , İ. Kılıç: "The Effect of Different Mineral Water Used as Cure and Mix Water on the Bending and Compressive Strength of Cement Mortar"
16:35-16:50	C. Demirel , B. Öztoprak, O. Şimşek: "Evaluatıon of Mechanical Characteristics of the Interlocking Concrete Paves Produced Fly Ash"
16:50-17:05	C. Demirel , B. Öztoprak, O. Şimşek: "Effects of Different Aggressive Conditions on Cement Mortars Containing Rice Husk Ash"
17:05-17:20	F. Yakuphanoğlu, Ahmed A. Al-Ghamdi: "Electrical Conductivity, Seebeck Coefficient and Optical Properties of SnO_2 Film Deposited on ITO By Dip Coatıng"
17:20-17:35	A. Fatehmulla, I. A. AlDawood, R. Qindeel, A.M. Aldhafiri, A.A. Albassam, W.A. Farooq, F. Yakuphanoglu: "Bandgap Tuning and Strong Blue-Green Band Emissions of Sol-Gel Synthesized ZnO Films By High Cu Doping"
17:35-17:50	B. A. Gozeh, B. Coskun, F. Yakuphanoğlu "Solar Lightresponsive Zno Nanoparticles Adjusted Using Cd and La Co-Dopant Photodetector"
18:00-19:00	**Poster Session**
19:00	**Dinner**

21 SEPTEMBER 2018 (FRIDAY) **HALL 1**	
09:30-10:30	**1st session (oral talks) Chair: M. Çamur**
09:30-10:00	**Invited Talk-6, N. Çağlar: "Environmental Monitoring and Material Based Studies on Chemical Oceanography"**
10:00-10:30	**Invited Talk-7, Y. Azizian: "Preparation and Optical Characterization of Cds/Zns-Polymer Superlattice Nanocomposites"**
10:30-10:50	**Coffee Break**
10:50-12:20	**2nd session (oral talks) Chair: T. Asar**
10:50-11:05	Ş. Karataş: "The Analysis of the Electrical Properties of the Cu//N-Type Si Structures At Room Temperature"

11:05-11:20	Ş. Karataş: "Temperature Dependence of C–V And G/□–V Characteristics of Sn/P-Type Si Schottky Structure"
11:20-11:35	E. Ahlatcıoğlu Özerol: "Chemical Synthesis and Optoelectronic Characterization of Poly(2-Anilinoethanol) Doped with Organic Acids"
11:35-11:50	R. Karapinar: "Polymer-Dispersed Liquid Crystal Technology"
11:50-12:05	R. Atasoy, B. Doran, H. Kılıç: "Nonlinear Analysis of Buried Pipes under the Static Loads"
12:05-12:20	B. Akgenc: "Effect of Y-doping on ZrO_2: First-principles calculations"
12:20-13:45	**Lunch**
13:45-15:45	**3rd session (oral talks) Chair: N. Çağlar**
13:45-14:00	Sh.Mirzaei, Mohammad Azad-Kalandaragh, Y. Azizian-Kalandaragh: "Structural and Magnetic Properties of $CoFe_2O_4$/ Fe_3O_4 / Polyvinylpyrrolidone Nanoparticles"
14:00-14:15	Y. Azizian-Kalandaragh, J. Farazin, G. Pirgholi-givi: "Structured Light and its Applications in Organic Electronics"
14:15-14:30	M. B. Coban, H. Kara, Y. Acar: "Crystal Structure and Red-Photoluminescence Behaviour of Eu (III) Based Metal-Organic Framework"
14:30-14:45	H. Kara, M. B. Coban, Y. Acar: "Syntheses, Structure, Near-Infrared and Visible Luminescence Of Nd (III)- Coordination Polymer"
14:45-15:00	Y. Acar, M. B. Coban, H. Kara: "Structure Analysis and Solid State Luminesence Properties of the New Tb (III) Compound with 1-D Hexagonal Channel"
15:15-15:30	S. Sarıtaş, M. Kundakcı, M. Yıldırım: "Gallium Doped Spinel Zinc Ferrite and Magnesium Ferrite Thin Films Grown by Spray Pyrolysis "
15:30-15:45	S. Sarıtaş, M. Kundakcı, M. Yıldırım: "Studies on the Optical, Structural and Electrical Properties of Cadmium Doped Zinc Ferrite and Magnesium Ferrite"
15:45-16:05	**Coffee Break**
16:05-17:50	**4th session (oral talks) Chair: A. Ege**
16:05-16:20	S. Aksimsek, E. A. Özek, B. Pas: "3d Printed Dielectric-Silver Ink Hybrid Antenna For Wi-Fi Applications "
16:20-16:35	S. Aksimsek, A. Akyıldız, M. A. Tulum: "Design, Simulation and Fabrication of a Novel Dual-Polarized Ortho-Mode Transducer"
16:35-16:50	S. S. Karabeyoğlu, O. Ekşi, F.Yıldız: "Investigation of Effects of Die Materials on Coating Thickness by Changing the Time of Galvanizing"
16:50-17:05	O. Ekşi, S. Karabeyoğlu, E. Cabbar, K. Feratoğlu: " Thermoforming of a Poly (lactic acid) Sheets Produced by 3D Printing"
17:05-17:20	T. Çakıcı, M. Özdal, M. Kundakcı: "Biosynthesis of Go: Se Nanoparticles Using as Thin Films and Go: Se /P-Si Device Application"

17:20-17:35	T. Çakıcı , M. Özdal, M. Kundakcı: "Green Bio-Chemistry Approach for Fabrication of Go:Cu/P-Si Device Application"
17:35-17:50	A. Dere, B. Coşkun: "Phosphorus Doped Graphene Oxide Battery"
18:00-19:00	**Poster Session**
19:00	**Dinner**

21 SEPTEMBER 2018 (FRIDAY) HALL 2	
09:30-10:30	**1st session (oral talks) Chair: S. Güneş**
09:30-10:00	**Invited Talk-9, W. A. Farooq: "Laser Induced Modification in Nano Structured Thin Films Synthesized by Sol-Gel Method"**
10:00-10:30	**Invited Talk-10, N. Akdoğan: "Shapeable planar hall effect-based biosensors"**
10:30-10:50	**Coffee Break**
10:50-12:20	**2nd session (oral talks) Chair: N. Sarı**
10:50-11:05	Ö. S. Taşkın: "A Novel Microporous Composite Material for Vacuum Insulation Panels"
11:05-11:20	U. H. Kaynar: "Modelling, Analysis and Optimization of Strontium (II) Ions Adsorption onto Nano-Zno/Chitosan Bio-Composite Beads with Respons "
11:20-11:35	A. Ege, S. Uysal Satılmış, L.Türkler: "Luminescence Characterization of Yttrium Stannate Phosphors"
11:35-11:50	S. Çam Kaynar: "Measurement of Radioactivity in Beach Sands"
11:50-12:05	U. H. Kaynar, S. Çam Kaynar: "Thorium (IV) Ions Adsorption onto MgO Nanoparticles Prepared with Combustion Synthesis; Modelling and Optimization Using Response Surface Methodology (RSM) "
12:05-12:20	F. Yakuphanoğlu, Z. H. Gafer: "Photovoltaic Properties of the Organic–Inorganic Photodiode Based on Polymer and Fullerene Blend for Optical Sensors
12:20-13:45	**Lunch**
13:45-15:45	**3rd session (oral talks) Chair: B. Mısırlıoğlu**
13:45-14:00	W. A. Farooq, Awatef. S. Al-Johani, M.S Alsalhi, W. Towfik, Rabia Qindeel: "Analysis of Polystyrene and Polycarbonate Used in Manufacturing of Water and Food Containers Using Laser Induced Breakdown Spectroscopy"
14:00-14:15	N. Baylan: "Environmentally Friendly Ionic Liquids as Bulk Liquid Membranes: A Design Study of Propionic Acid Removal "

14:15-14:30	S. Uysal Satılmış, A. Ege, L. Türkler, A. Özkan: "Investigation of Thermally Stimulated Luminescence Kinetic Parameters of UV Irradiated Yttrium Niobate"
14:30-14:45	H. Keçeci, M. Yazgan: "Practical Clinical Veterinary Application Program"
14:45-15:00	Ö. Demir Oğuz, D. Ege: "Effect of Methylcellulose and Citric Acid Concentrations on the Rheological Properties of an Injectable Hydrogel"
15:00-15:15	A. Bilici, F. Doğan: "New Conducting Polymer Blends from Amino-Substituted Naphthalene Sulfonic Acid For Antistatic Applications"
15:15-15:30	A. Bilici, F. Doğan: "The Influence of Dispersive Agent on Solid State Thermal Decomposition of Ldpe/J-Acid Binary Blends"
15:30-15:45	A. Kösemen, Y. Kalkan, "Fabrication and Characterization of Organic Field Effect Transistor Based Radiation Detector"
15:45-16:05	**Coffee Break**
16:05-17:50	**4th session (oral talks) Chair: S. Koyuncu**
16:05-16:20	M. E. Turgay: "Measurements of Outdoor Gamma Dose Rate and Annual Dose Calculation for IDA Villages, Stated Around Edremit&Ayvacık Districts; Balıkesir&Çanakkale, Turkey"
16:20-16:35	M. E. Turgay: "Surveillance for Nuclear Electronıcs at a Glance"
16:35-16:50	M. E. Turgay: "Annual Dose Determinations in Drinking Water and Air, for Costal Counties Closest to Syrian Board of Turkey"
16:50-17:05	A. Ergün, K. Çıkrıkçı, N. Gençer, O. Arslan: "Purification of Carbonic Anhydrase I and II with Affinity Chromatography Column and Inhibition Properties of Some Benzimidazolium"
17:05-17:20	Y. Kalkan, A. Kösemen: "First Results of Rayleigh Scattering Method to Define Size of Cluster Ions in a Gas Detector"
17:20-17:35	B. Bekar, F. K. Boz, S. Aktas, S. E. Okan: "The Properties of Intersubband Optical Absorption Coefficients under Intense Laser Field for Different Locales of a Square GaAs/Al (GaAs) Quantum Well Wires "
17:35-17:50	M. Alkan, I. Yavuz: "Morphology and Charge-Mobility of Long Alkyl Side-Chained Btbts"
18:00-19:00	**Poster Session**
19:00	**Dinner**
21 SEPTEMBER 2018 (FRIDAY) **HALL 3**	
10:50-11:50	**1st session (oral talks) Chair: D. Nartop**

10:50-11:05	N. Kurnaz Yetim, N. Sarı: "Novel Dendrimers Containing Redox Mediator: Enzyme Immobilization and Applications "
11:05-11:20	N. Akkurt, L. Torun: "Synthesis and Properties of Macromolecular Structures Based on Triazine"
11:20-11:35	B. C. Körükçü, C. Torlak, U. Çebi, C. Özcan: "Investigation of Cu-Endosulfan Correlation in Water Samples by Using Icp-Oes and Gc-Ms"
11:35-11:50	S. Aközcan, O. Günay, M. B. Öztürk, S. Özden: "Determination of ^{137}Cs Concentrations in Kadikoy-Istanbul"
12:20-13:45	**Lunch**
13:45-15:00	**2nd session (oral talks) Chair: Y. Kalkan**
13:45-14.00	S. Özden, M. M. Koç: " CdTe Thin Films for Infrared Detector Applications"
14:00-14:15	F. Kurşun: "Application of Poly (Vinyl Alcohol) / NaY Zeolite Mixture Membranes in Pervaporation Method"
14:15-14:30	C. Torlak, B. C. Körükçü, F. Kurşun, C. Özcan: "Determination with Quechers Extraction Method of Imazamox in Root and Leaf of the Sunflower Plant by GC-MS"
14:30-14:45	H. Keçeci, A. Gazioğlu: "The Efficient Role of Rapid Diagnostic Biochemical Test Kits on Treatments in Neonatal Enteritis"
14:45-15:00	B. Özer, S. Kızılay: "A Research on Geothermal Energy Potential in Kirklareli City "
16:05-17:50	**3rd session (oral talks) Chair: C. Özcan**
16:05-16:20	S. Balkan: "The Influence of Origanum Vulgare L. On Hemolysis and Oxidative Damage in Human Erythrocytes Exposed to High Glucose Concentration "
16:20-16:35	H. Karayer: "Analytical Solution of Schrodinger Equation for a 2D Charged Particle Confined by External Magnetic and Ab Flux Fields Under Power Interaction Potentials"
16:35-16:50	T. Yavuz, B. Coskun: "Structural, Optical and Electrical Properties of Ag Doped ZnO Thin Films Deposited By Sol-Gel Process"
16:50-17:05	A. Dere, B.Coşkun: "Electromagnetic Interference Properties of Sn Doped ZnO Semiconductors "
17:05-17:20	B. Coşkun, A. Dere: "Investigation of Electro Optical Properties of Various Polymer-Doped Liquid Crystal"
17:20-17:35	R. O. Ocaya, F. Yakuphanoğlu: "Organic semiconductor photosensors"
17:35-17:50	B. Coşkun, A. Dere: "Investigation of Phase Transition Properties of Various Polymer-Doped Liquid Crystal"
18:00-19:00	**Poster Session**
19:00	**Dinner**

POSTER PROGRAMME

20 SEPTEMBER 2018 (THURSDAY)

18:00-19:00 Poster Session

PP101	H. Şanlıdere Aloğlu, Y. Özcan, H. Uran: "Bionanocomposite Applications for Cheese Packaging"
PP102	B. Kirezli, I. Gucuyener, A.Kara, M. Ahmetoglu (Afrailov): "Electrical and optical properties of photodiode structures formed by surface polymerization of P(EGDMA-VPCA)/SWCNT films on n-Si"
PP103	M. Duman: " Controlling Servo Motors With Speech Recognition by Using 802.15.4 Wireless Protocol Zigbee"
PP104	T. Batmaz, B. Kirezli, M. C. Haciismailoglu, M. Ahmetoglu (Afrailov): "The Electrical and Optical Characterization of Electrodeposited Ni /n-GaAs Schottky Barrier Diodes"
PP105	T. Batmaz, B. Kirezli, M. C.Haciismailoglu, M. Ahmetoglu (Afrailov): "Electrical Properties of Ag/n-GaAs Schottky Photodiodes"
PP106	T. Ateş Türkmen, E. Aslan, E. Altürk Parlak: "The Effect of Graphene Oxide on Stability of Perovskite Solar Cell"
PP107	S. Özden, M. M. Koç: "Chemical Treatment and Characterization of (211) B GaAs Wafer Surfaces"
PP108	Ş. Karataş, H. Özerli: "On the Electrical Properties of Ag/Graphene Oxide/P-Si Structures at Room Temperature"
PP110	S. Pıravadılı Mucura, R. Kacara, C. Kök, C. Meric, S. Koyuncu: "Organic Light Emitting Diodes Application of Green Emmisive Polyfluorene Derivatives"
PP111	Ü. Geçgel, O. Üner, T. Avcu: "Antibiotic Adsorption by Activated Carbon From Seed Balls of Sycamore Tree"
PP112	O. Üner, T. Avcu, Ü. Geçgel: "Production of Activated Carbon From Seed Balls of Sycamore Tree"
PP113	Ö. Çelebican, İ. İnci, N. Baylan: "Modeling and Optimization of Formic Acid Adsorption by Multiwall Carbon Nanotube Using Response Surface Methodology"
PP117	E. B. Balcıoğlu, A. Aksu: "Polycyclic Aromatic Hydrocarbons (Pahs) Contamination in the Surface Sediments of Southern West Black Sea and Northern East Aegean Sea, Turkey"
PP118	H. Kırpık, M. Köse: "N-Alkylbenzimidazole Compounds and Their Metal Complexes: Photophysical and Liquid Crystal Properties"
PP119	H. Kırpık, M. Köse: "Synthesis of Benzimidazole-Based Compounds and Their Metal Complexes: Liquid Crystal Properties"
PP120	A. E. Bulgurcuoğlu, P. Kavak, O. İçelli: "Electrochromic Properties of Electrochemically Synthesized Polyaniline"
PP121	E. Hasanoğlu Özkan, A. Dişli, N. Sarı: "Investigation of Solid State Conductivities of New Tetrazole-Pt (Ii) Complexes"

PP122	M. Gul, M. N. Kamsız, B. Canımkurbey: "Evaluation of New Alkyne-Based Compounds for Optoelectronic Properties"
PP123	B. Süngü Mısırlıoğlu, Z. Güven Özdemir, Y. Salt, B. Tırnakçı: "Complex Impedance and Ac Conductivity Analyzes of Ceramic Doped Poly (Vinil Alcohol) Composites"
PP124	M. Kılıç, Z. Güven Özdemir, B. Süngü Mısırlıoğlu, Ö. Çakır, N.D. Kahya, M. Acet: "Temperature Dependent Magnetization and Dielectric Properties of Copper Ferrite/Copper Oxide Nano Composites"
PP125	O. Yoruk, Y. Bayrak, M. Ates: "The Supercapacitor Device Performences of rGO/TiO_2/PANI Nanocomposites and Electrical Circuit Model Analysis"
PP126	P. Kavak, B. Süngü Mısırlıoğlu, Z. Güven Özdemir, D. Şakar Daşdan, J. Pionteck, P. Pötschke, B. Voit: "Complex Electrical Modulus Spectra Analysis of Multi Walled Carbon Nanotube Doped Ardel Composites"
PP127	D. Nartop, E. Hasanoğlu Özkan, S. Çeker, N. Kurnaz Yetim, G. Ağar, H. Öğütcü, N. Sarı: "Antimicrobial and Antimutagenic Activity of Polymeric Microsphere Including Azomethine"

21 SEPTEMBER 2018 (FRIDAY) **18:00-19:00 Poster Session**	
PP201	B. Ceylan, Y. Yeşiloğlu: "A Spectroscopic Study on the Chelating Activity of Iron(II) Ions of Rowanberry Extracts"
PP202	B. Ceylan, Y. Yeşiloğlu: "A Spectroscopic Study on the Determination of Total Ferric (Fe^{3}+) Ions Reduction Capacity of Rowanberry Extracts"
PP203	M.Ates, M. Yildirim, O. Kuzgun, H. Ozkan: "The Synthesis of RuO_2, rGO/RuO_2 and rGO/RuO_2/PVCz Nanocomposites and Their Supercapacitors"
PP204	N. Kurnaz Yetim, N. Sarı: "The Significance of the Ache Enzyme-Immobilized Ferrocene-Based Dendrimers in the Determination of Organocarbamate Pesticides"
PP205	N. Kurnaz Yetim, N. Sarı: "The Effect of Support Material on the Reusability of Immobilized Enzymes"
PP206	M. Çamur: "New Water Soluble Zn (II) Phthalocyanine Bearing 7-Oxy-4-(Pyridine-3-Yl) Coumarin Derivatives"
PP207	M. Çamur, N. Güneri: "Synthesis and Spectroscopic Properties of New Alpha / Beta-Substituted Mg (II) Phthalocyanines"
PP208	M. Çamur: "Novel Copper Metallo Phthalocyanines and Spectroscopic Properties"
PP209	N. Akkurt, M. Hadi Ali, L. Torun: "Synthesis and Characterization of New Star-Shaped Macromolecular Structures"
PP210	D. Nartop, H. Öğütcü, E. Hasanoğlu Özkan, S. Çeker, G. Ağar, N. Sarı, N. Kurnaz Yetim: "Determination of Antimicrobial and Antigenotoxic Effects of Polymeric Schiff Base"
PP211	E.Pelit, M.Gül: "The Spectroscopic Properties of Isoxazolopyridine and Spirooxindole Derivatives"
PP212	E.Pelit, M.Gül: "The Spectroscopic Properties of Pyrazolopyridine Derivatives"
PP213	E.Pelit, G.Taş: "Synthesis of New Heterocyclic Compounds"

PP214	Ö. Çelebican, İ. İnci, N. Baylan: "Investigation of Adsorption Properties of Levulinic Acid by a Nanotechnological Material"
PP215	A. Avcı, İ. İnci, N. Baylan: "Adsorption of Ciprofloxacin Hydrochloride on Carbon Nanotube"
PP216	S. Erdönmez, Y. Karabul, M. Kılıç, O. İçelli, Z. Güven Özdemir: "The Influence of Nano Structured Tungsten Oxide Additive on the Impedance Spectrum of Polythiophene"
PP217	S. Erdönmez, M. Kılıç, Y. Karabul, O. İçelli, Z. Güven Özdemir: "Complex Dielectric Analysis of PIn/WO_3 Nano Composites"
PP218	Ü. Alkan, M. Kılıç, S. Erdönmez, Y. Karabul, Z. Güven Özdemir, O. İçelli: "Mechanical Performance of PP/$BiSr_2CaCu_2O_{6.5}$ Composites"
PP219	M. Arslan: "Synthesis and Characterization of Novel Bio-Based High Performance Polybenzoxazine from Gallic Acid"
PP220	B. Akyüz, İ. Kaya: "Synthesis, Characterization and Electrochemical Properties of Poly (Phenoxy-Imine)S Containing Naphthalene Unit"
PP221	D. Erdener: "Synthesis, Characterization and Catalytic Activity Of Ru(Ii) Complex of Cyclotriphosphazene Ligand Containing Chloropyridine"
PP222	D. Erdener: "Synthesis and Characterization of Cyclophosphazene Derivative Containing Carbazole"
PP223	A.Karsli, M. Kazici, S. Bozar, S. Akyurekli, M. Kaleli, S.Gunes: "Sol-Gel-Processed Dmso-Doped Pedot:Pss as Hole Transport Layer in Inverted Type Perovskite Solar Cells"
PP224	M. Kazici, C. Y. Goreci, S. Bozar , C. Ulbricht, D. A. M. Egbe: "Cyano Containing Small Acceptor Molecules for Inverted Type Organic Solar Cells"
PP225	M. Kazici, S.Gunes, D. Baran, N.S. Sariciftci, M. Scharber: "Fullerene-Free Inverted Type Organic Solar Cells"
PP227	W. A. Farooq: "Applications of Nanomaterials for the Diagnosis of Cancer"

INVITED SPEAKERS

ORAL PRESENTATIONS

POSTER PRESENTATIONS

INVITED SPEAKERS

UNCONVENTIONAL POLYMERIZATION APPLICATIONS OF CONJUGATED SYSTEMS AND NANOPARTICLES

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Conjugated polymers specifically polythiophenes are interesting class of organic compounds. Due to their unique photophysical and electrochemical properties, they are extensively used as electronic and electro-optic devices such as organic photovoltaics, light emitting diodes, batteries, electrochromic and sensors in organic electronic material technologies. Besides their use in organic electronic material technologies, they were shown to act as catalysts in various polymerization processes via photoinduced electron transfer reactions [1]. Photochemically formed radical cations on the thiophene rings provide possibility of synthesizing polythiophenes or producing Bronsted acids that can initiate the cationic polymerization of cyclic monomers and vinyl ethers [2-4].

Photoinduced electron transfer reactions can also utilized for the in situ preparation of nano composites. The presentation will also cover initiation of various polymerization processes by semiconductor nanoparticles [5-7].

[1] S. Dadashi-Silab, S. Doran, Y. Yagci, Photoinduced Electron Transfer Reactions for Macromolecular Syntheses., *Chem. Rev.*, 116, 10212 (2016)
[2] B. Aydogan, A. S. Gundogan, T. Ozturk, Y. Yagci, A dithienothiophene derivative as a long-wavelength photosensitizer for onium salt photoinitiated cationic polymerization., *Macromolecules*, 41, 3468 (2008)
[3] B. Aydogan, A.S. Gundogan, T. Ozturk, Y. Yagci, Polythiophene derivatives by step-growth polymerization via photoinduced electron transfer reactions. *Chem. Commun.*, 6300 (2009)
[4] S. Beyazit, B. Aydogan, I. Osken, T. Ozturk, Y. Yagci, Long wavelength photoinitiated free radical polymerization using conjugated thiophene derivatives in the presence of onium salts., *Polym. Chem*. 2, 1185 (2011)
[5] S. Dadashi-Silab, A.M. Asiri, S.B. Khan, K.A. Alamry, Yagci Y, Semiconductor nanoparticles for photoinitiation of free radical polymerization in aqueous and organic media.. *J.Polym. Sci.Part A: Polym. Chem*., 52, 1500 (2014)
[6] S. Dadashi-Silab, Y. Yar, H.Y. Acar, Y. Yagci Magnetic iron oxide nanoparticles as long wavelength photoinitiators for free radical polymerization.. *Polym. Chem.* 6, 1918 (2015)
[7] Photoinduced atom transfer radical polymerization using semiconductor nanoparticles. S. Dadashi-Silab, M.A. Tasdelen, A.M. Asiri, S.B. Khan, Y. Yagci *Macromol. Rapid Commun.* 35, 454 (2014)

ORGANIC PHOTOVOLTAICS: ROUTE TO THE PHOTOVOLTAIC MARKET

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Recently, organic photovoltaics attracted very much attention due to easy processing, wide variability due to chemical tailoring, light weight and low cost of organic semiconductors. Also, compatibility with flexible substrates and easy integration to many types of devices make the organic semiconductors superior as compared to their inorganic counterparts. Although the efficiency of organic photovoltaic cells increased to ca. 13 % from modest values of 0.5 % in quite a short period of time, there are still some issues to be resolved such as stability, lifetime and efficiency for the organic photovoltaic cells to take their places in the photovoltaic market.

In this talk, the past, today and future of organic photovoltaic cells will be discussed. The prerequisite for them to take their places in the PV market and also our group's studies on organic photovoltaic cells will be explained.

ENVIRONMENTAL MONITORING AND MATERIAL BASED STUDIES ON CHEMICAL OCEANOGRAPHY

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Marine Science studies in our country are predominantly progressing through pollution monitoring studies. Contrary to these conventional studies, our main branch of science is trying to combine Marine Sciences and Engineering with the basic sciences and other sciences. For this purpose, we are focusing on maximum utilization and protection of our seas. In the light of this vision, the use of newly developed or already existing polymeric materials in the field of marine technology, the development of new treatment techniques to protect our seas, the production of biotechnological products from our seas, the acquisition of new eco- friendly chemicals to protect the aquatic life are among the broad study subjects of our department. In addition to all these studies, our main branch of science is trying to find new products. With these studies, the disciplines belonging to the Chemical Oceanography Main branch, which differs from the other working groups in the marine sciences, have national and international patents. These works have also been published in important international issues. Our main discipline, which is constantly working to renew itself in terms of study subjects, is also working on current pollutants in monitoring studies (microplastics, examination of pharmaceuticals, algal toxins, etc.). In addition, new absorption strategies for passive sampling, which are among the new monitoring strategies, have started and new products are aimed to be added to our country in the field of marine sciences. In addition to these innovative researches, our department also examines the bio-chemical cycles of the sediment-sea-atmosphere, and studies on the determination of the levels of inorganic (metal and ions) organic (PAH, Pesticide, etc.) pollutants in these three matrices. It also carries out fingerprinting studies for the determination of marine pollution in ships and for the elimination of this pollution.

Keywords: Chemical Oceanography, Pollution, Monitoring Studies, Eco-Friendly Polymer

SHAPEABLE PLANAR HALL EFFECT-BASED BIOSENSORS

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Shapeable (flexible, printable, and even stretchable) magnetoelectronics became one of the most important technological research fields of the last years. Foreseeable applications of highly sensitive, cost effective and re-shapeable magnetoelectronics also include magnetic particle detection in microfluidics and lab-on-a-chip platforms. Magnetoresistive-based biochips, detect magnetic labels instead of fluorescent labels, have been extensively investigated for sensitive measurement of low bio-target concentration in body fluids. The main aim of these investigations is development of high sensitive magnetic field sensors that are optimized for magnetic label detection. All magnetic biosensors detect the stray field of magnetic particles that are bound to biological molecules. Since the biological environment is normally non-magnetic, the possibility of false signals being detected is negligible. In this talk, I will give a brief information about shapeable magnetoelectronics and explain the principles of magnetoresistive biosensors. I will also talk about our ongoing research on planar Hall effect-based biosensor applications.

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STRUCTURED LIGHT AND ITS APPLICATIONS IN ORGANIC ELECTRONICS

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In the past recent years, the study of the structure and nature of light, have been attracted great attention because of its physics and also applications in the modern technologies. Development of the electronics and organic materials helps the synergistically improved this branch of science and exreamly affects the development of the light-based technologies. In this talk, I briefly discuss the structured light and its applications. Various views and applications have been presented for the light. One of the features of the light beam is the light phase structure. Light can have a phase structure with angular momentum for it to be defined, an angular momentum is divided into two parts of the spin angular momentum (SAM) and orbital angular momentum (OAM) that is known as SAM called circular polarization and OAM of azimuthal phase structure of the light [1]. In a scientific study, an optical structure with a particular structure can also be considered as mathematical functions.

Since the pioneering work of orbital angular momentum (OAM) of photon by Allen et al. [2] the unique optical property of vortex beam, i.e. the helical phase front and azimuthal wave vector, has attracted much interest in optical community and brought about a plethora of applications in micromanipulation, quantum optics, optical communication, and surface plasmon shaping. Laguerre-Gaussian mode of the light structure is well-defined for OAM [2]. Functions of a different structure also apply to the Helmholtz equation, and light can be constructed with such structures as Gaussian beams, Hermits-Gaussian [3], Bessel [3], Airy [4], etc.

Many tools can be used to make structured light including, Dove prism, q-plate [5], hologram [6] and etc. Spatial light modulators (SLM) can be used to change the light phase structure. Of course, this tool is very expensive, so we used a projector LCD to make low-cost SLM and we could use it to make different beams [7]. In this work, the phase hologram created the beams on a computer and using our SLM, we can change Gaussian laser beam into a variety of structured light. In addition, using phase shift techniques, we were able to provide newly structured light tweezers that could be used in future to make optical tweezers. The light can interact with particles, and this interaction changes the structure of light or interacts with specific particles with a specific structure, such as particle imprisonment. The propagation of optical radiation in natural aqueous media is accompanied by intense processes of light absorption, reflection, and scattering [8].

By using the four LG's shifted beam, we were able to offer a beam for the construction of optical tweezers. LG Beams have the following function:

$$E_{mn}(x.y.z=0) = [\frac{\sqrt{2r}}{w_0}]^n L_m^n \left[\frac{2r^2}{{w_0}^2}\right] \exp[-\frac{r^2}{{w_0}^2} + in\varphi],$$

where (r, ϕ, z) are cylindrical coordinates, w_0 is the Gaussian beam waist, n is the topological charge of an optical vortex, and $L_m^n(x)$ is an adjoint Laguerre polynomial. The four shifted rays we built have the following functionality:

$$E_{mn}(x.y.z) = \frac{w_0}{w(z)}[\frac{\sqrt{2}}{w(z)}]^n \exp(-i(n+2m+1)\xi(z)) \sum_{p=0}^{4}[(x-x_p) + i(y-y_p)]^n L_m^n \left[\frac{2{r_p}^2}{w(z)^2}\right] \exp[-\frac{{r_p}^2}{w(z)^2} + \frac{ik{r_p}^2}{2R(z)}],$$

where $w(z) = w_0\sqrt{1+(\frac{z}{z_R})^2}.R(z) = z\left[1+\left(\frac{z_R}{z}\right)^2\right].\xi(z) = \arctan\left(\frac{z}{z_R}\right), z_R = k{w_0}^2/2$ is the Rayleigh range and k = $2\pi/\lambda$ is the wave number of light of wavelength λ. Using these relationships, we were able to construct the following images and obtain the following empirical result:

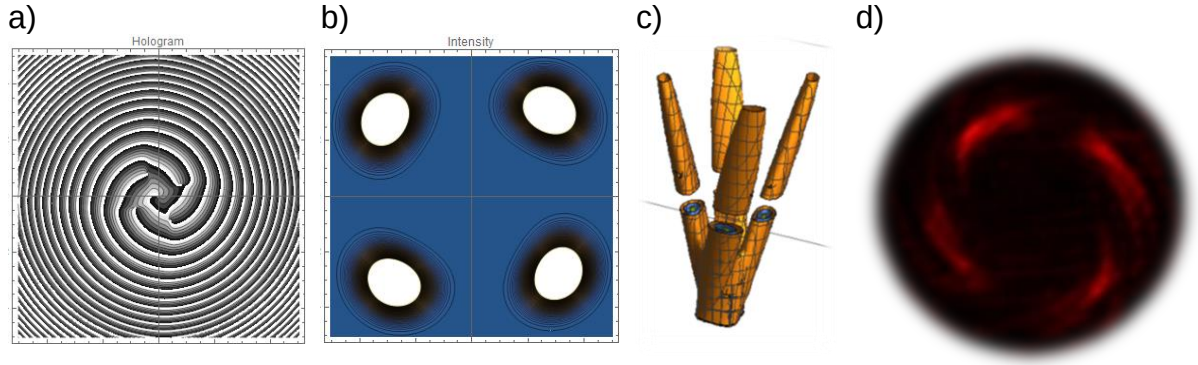

Figure1. Light beam build with four shifted orbital angular momentum L = 5: a) Phase pattern, b) Intensity pattern, c) 3D beam profile, d) Experimental result.

By making different metasurface, it can create light with a certain OAM and also can be made with nanoslits particles on a film with aluminum nanometer thickness, such as a q-plate phase hologram. Using the plasmonic metasurface transforms any mode into its own mirror image and is optically equivalent. To produce light with OAM, perfect electric conductor (PEC)-perfect magnetic conductor (PMC) metasurface can also be used. Another interaction of light with nanoparticles can be found in SPR, in which a lot of research has been carried out on the height or gender of plasmons, and many studies have been done.

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LASER INDUCED MODIFICATION IN NANO STRUCTURED THIN FILMS SYNTHESIZED BY SOL GET METHOD

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Nano structured thin films have been widely used in electronics equipment employed in laser labs. Therefore, investigations in laser induced modifications in nanostructured thin films are required. Structural modification and changes in optical properties of laser irradiated nano structured thin films synthesized using sol-gel technique are presented. Q-switched Nd-YAG pulsed laser from Quantal was used to irradiate the nanostructured thin film samples. The Nd: YAG laser has Pulse width of 8ns and it operates at maximum 10 Hz. The fundamental wavelength of the laser at 1064 nm and second harmonic 532 nm wavelengths were used to irradiate the samples.

Structural modifications are investigated with images of scanning electron microscope and XRD patterns. Crystal sizes are calculated from FWHM of XRD peaks using scherrer formula. Optical properties are studied via absorption and photoluminescence spectra. Optical band gaps are estimated from Tauc plot. The study reveals that optical band gaps of nanostructured thin films are controlled with laser irradiation. The results are important for application of semiconductors in optoelectronic devices and micromachining with lasers.

PHOTOCONDUCTIVE SCHOTTKY DIODE BASED ON Al/P-Si/CdO/Ag FOR OPTICAL SENSOR APPLICATIONS

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The Schottky barrier junctions of tin disulfide (CdO) on p-silicon were fabricated using sol–gel spin technique. The photoresponse and junction properties of the diode were investigated. The ideality factor and barrier height of the Al/p-Si/CdO/Ag diode were obtained to be 1.6 and 0.55 eV, respectively. The photocurrent properties of the device under various illuminations were also explored. The photocurrent in the reverse bias voltage is increased by increasing photo-illumination intensity. The transient photocurrent results indicate that photocurrent under illumination is higher that the dark current. The capacitance–voltage characteristics of diode were also investigated at different frequencies. The capacitance decreases with increasing frequency due to a continuous distribution of the interface states. These results suggest that the fabricated diode can be used for optical sensor applications.

STRONG COMPOSITION DEPENDENCE OF RESISTIVE SWITCHING IN $BA_{1-X}SR_XTIO_3$ THIN FILMS ON SEMICONDUCTING SUBSTRATES AND ITS THERMODYNAMIC ANALYSIS

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In this work, we report on the variability of the Schottky effect in solution processed $Ba_{1-x}Sr_xTiO_3$ films (BST, x=0, 0.5) grown on 0.5% Nb doped $SrTiO_3$ substrates with top Pt electrodes (NSTO/BST/Pt). The films display leakage currents accompanied by varying degrees of hystereses in the current-voltage measurements. The magnitude of the leakage and hystereses depend on the Sr content. We focus on the current-voltage (I-V) behavior of our samples in the light of thermodynamic theory of ferroelectrics coupled with equations of semiconductors,. Our calculations allowed us to unambigously determine the electronic character of the defects and related band bending effects in our samples. The extent of asymmetry and the hystereses in the I-V curves for x=0 and 0.5 are shown to be controlled by the polarization in qualitative agreement with our calculations. Amplitude of the ferroelectric polarization, which is a function of composition here, has a strong impact on leakage currents in forward bias while this effect is much weaker under negative bias. The latter occurs as polarization pointing away from the NSTO semiconducting substrate causes depletion of carriers at the NSTO side of the NSTO/BST interface, increasing resistance to current flow through the stack. Such an occurence also increases the energy gap between the Fermi level and the conduction bands of the films, thereby reducing the bulk conduction through the film as well. The dependence of leakage currents on polarization direction points out to the possibility of a non-destructive read-out route in ferroelectric films much thicker than tunnel junctions.

METAL-SEMICONDUCTOR-METAL INFRARED PHOTODETECTORS

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As seen from Figure.1, the Metal-Semiconductor-Metal (*MSM*) infrared photodetectors consist of a combination of a semiconductor active layer and two interdigital electrodes [1]. The interdigital electrodes often design as an interlinked in the form of a comb structure, leaving a free semiconductor surface between the two electrodes which forms the active region in which light will be absorbed. While one of the electrodes has a role in forming the photon flux, the other electrode acts a collector role [2].

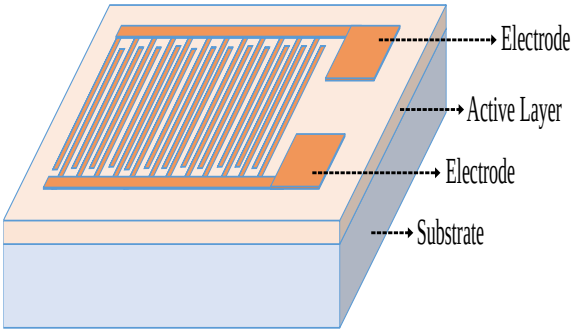

Fig.1. Schematic presentation of an MSM photodetector

The detection of infrared radiation is possible by determining the electronic charge distribution in the material [3]. In addition, the working wavelength of an MSM infrared photodetector depend on the critical parameters such as the Schottky barrier height, the doping of the semiconducting material [4].

In this presentation, MSM infrared photodetector will be dealt with which is completed in Gazi University Photonics Application and Research Center. The electrical output parameters of fabricated MSM infrared photodetectors such as working wavelength, Schottky barrier height (ϕ_B), saturation current (I_o), carrier density (N), mobility (μ), carrier lifetime (τ) and carrier diffusion length (L) will be examined. In addition, the presentation will also include the studies of optical crystal and photodetector, which are maintained and planned at Gazi University Photonics Application and Research Center.

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MULTIFUNCTIONAL MULTIPHASE POLYMERIC SYSTEMS

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Nanocellular polypropylene (PP)-multiwalled carbon nanotube (MWCNT) composite foams are reported. PPMWCNT composites were prepared with a twin-screw extruder and foamed using a high-temperature batch process with supercritical carbon dioxide (CO2). The effects of foam saturation temperature on the crystallization behavior of PP-MWCNT were simulated using a high-pressure batch foaming chamber and DSC. Cellular structure, mechanical properties, and electrical conductivity of the composites were also characterized. Nanocellular structure (cell size = 70-350 nm) was achieved by controlling the PP crystallinity during the CO2 saturation by varying the saturation temperature. The results showed that the introduction of nanocellular structure increased the strain-at-break, specific toughness, and electrical conductivity of the PP-MWCNT nanocomposites by 310%, 270%, and more than one order of magnitude, respectively. For the given PP-CNT system, foaming enhances the electrical conductivity in the nanocellualr range. This means that nanocells could effectively realign the CNTs and enhanced conductivity. A critical degree of alignment results in maximum conductivity.

ORAL PRESENTATION

3rd International Conference on Organic Electronic Material Technologies (OEMT2018)
Sep 20-22, 2018, Kırklareli / TURKEY

INVESTIGATION OF THE EFFECT OF THE COATING PERFORMED BY THERMAL SPRAYING TECHNIQUES ON THE AUTOMOTIVE BRAKE DISC

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The thermal spray technique, which is one of the hard coating methods, is based on the principle of depositing the powder of the coating material onto the surface of the previously prepared substrate. The coatings made using the thermal spraying technique give the base material a special surface characteristic that it does not originally have. Thus, while the strength of a part is provided by the base material, the coating provides other features such as corrosion, wear resistance and thermal resistance. Pieces of different sizes and geometric shapes can be covered with these methods. In this technique, the substrate material to be coated is heated locally; so that, a lower heat is applied to the material. Thus, the thermal distortion, oxidation and other metallurgical properties of the material are prevented. Brake discs can be manufactured from traditional cast iron materials as well as from different types of expensive composite and ceramic-based materials. For this reason, coatings on the surfaces of conventional automotive brake discs can be applied to produce both superior tribological properties and economical materials. This study examines the thermo-mechanical properties of automotive brake discs and the properties of thermal spraying techniques to be used during coating to improve braking performance. Efforts to produce materials that have better tribological properties and are economical, within the context of the coatings to be made with this technique, reveal the importance of this study.

INVESTIGATION OF THE USE OF INTERMETALLIC COMPOUNDS AS BRAKE DISC COATING MATERIAL

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The surface properties, which are not present in the materials but are desired, can be obtained by applying the required surface treatments on the material. One of the most common of these processes is the coating of the surface with different materials. The performances of engineering materials used today may become inadequate against the increasingly heavy working conditions. In the selection of materials in structural applications, two goals are attracting attention. The first is to increase the working temperature without reducing the strength of the material, and the second is to prefer light materials with high specific strength. Ceramic materials provide high strength with low density, however, when these materials are added to the metallic constructions, serious compatibility problems are encountered. For this reason, there is still a growing interest in intermetallic phases, which close the gap between metallic alloys and ceramics.

The use of intermetallic materials instead of light metals in high-temperature applications is of great interest. Studies on intermetallic coatings have shown that high strength coatings with good surface properties and high-density can be obtained. In this study, mechanical, metallurgical and tribological effects of intermetallic coatings, which can be formed with different compositions of Al-Ti-Ni based metallic powders, on automotive brake discs were investigated. For this purpose, it is expected that economic benefits will be provided by improving the tribological properties and increasing the service life, as a result of covering the automotive brake disc with new and high-density metallic materials.

ONE-STEP MANUFACTURING OF A NANOSTRUCTURED HYBRID ELECTRODE MATERIAL VIA MICROWAVE ENERGY-BASED APPROACH AND ITS USE IN ENERGY STORAGE

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A hybrid electrode material (HEM), composed of carbonized conducting polymer (CP), i.e. polypyrrole nanofibers (PPy NFs), nanostructured zinc oxide (nano-ZnO) and carbon nanotubes (CNTs), was prepared for energy storage applications. HEMs were obtained through a one-step, hassle-free, rapid and highly efficient microwave (MW) energy-based approach. The overall morphology and content of the nano-ZnO and CNT compounds could be altered by simply changing the process parameters, i.e. ratios in the feedstock mixture or the MW process time. The thermal and morphological features, crystalline nature, elemental composition and also the electrochemical performance of the as-prepared HEMs were thoroughly investigated by using relevant material characterization methods such as scanning and transmission electron microscopy (SEM, TEM), energy dispersive X-ray spectroscopy (EDX), cycling voltammetry (CV) and galvanostatic charge/discharge (CD) tests. It was revealed that by synergistically blending the high conductivity from CNTs, the ultra-high porous surface area from carbonized NFs and the abundant pseudo-capacitive features from nano-ZnO in its structure, the as-synthesized HEMs could afford to exhibit promising capacitive performance (~ 190F/g at 2mV/s), excellent long-term CD stability (~ 90% during 2000 cycles), high energy and power densities (~ 35 Wh/kg at 500 W/kg) along with high specific surface area (~ 30-40 m^2/g) for energy storage applications.

MICROWAVE ENERGY-BASED FABRICATION OF HIERARCHICAL CARBON NANOTUBE/CARBON FIBER STRUCTURES

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Through a facile, simple, yet efficient, affordable and ultrafast (30 s) microwave (MW) energy-based approach, hierarchical structures made up of carbon fibers (CFs) decorated with multi-walled carbon nanotube (MWCNT) forest were produced at ambient conditions in one-step. Morphological features of the as-produced structures were characterized in details by using scanning and transmission electron microscopy (SEM, TEM) and the elemental analysis (EDX) techniques. Both the composite material characterization results and the versatile and easily controllable nature of the above mentioned process strongly support its promising success for the fabrication of such products that could be effectively used as a building material for a wide variety of advanced engineering applications including aerospace ships, communication satellites, passenger and war planes, vehicles in transportation, wind turbine blades, sports equipment and prosthetic limbs.

A NOVEL RAIL BIKE DESIGN AND ITS INTEGRATION TO KIRKLARELI RAILWAY LINE

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In this study, a unique rail bike was manufactured for the application of the concept of rail bike in Kırklareli. The transformations of the regular bikes to rail bikes are provided by integrating standard and electric bikes into the rail bike construction that is manufactured. The rail bikes are designed in three different ways: one type of single-user and two different types of dual-user bikes were produced. One is a rail bike that a couple can use together and easily mount it without changing any part of the bikes. Dual-use bicycles are manufactured in two different constructions. The bicycles used here can also be called "hybrid bicycles". Because they can be used both as regular bikes on roads as well as rail bikes on a railway with a simple assembly process. The other is designed as a single user. These bikes are supported by bikes that are both ergonomic and battery-powered so that the rail bikes can be easily used by people with disabilities. The strength analysis of the railway bicycles was carried out with the aid of a computer-based design program and the strength properties were determined. In the results of the stress analysis, it was found that the stress and strain values on the construction were within the safe limits. For this purpose, it is aimed to protect and revitalize the iron railway heritage which is not used today in Kırklareli without needing a new investment. It is also expected that this work will contribute to sustainable development with sportive and touristic activities to be carried out.

A TERNARY NANOCOMPOSITES OF rGO/MnO_2/PTTh FOR SUPERCAPACITOR EVALUATIONS

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Designing a new electrode active materials including reduced graphene oxide (rGO) and nanomaterials such as Mangan (IV) oxide (MnO_2) with Polyterthiophene (PTTh) have important for supercapacitor devices. In this work, we present a new ternary nanocomposite for using reduced graphene oxide (rGO), MnO_2 and polyterthiophene (rGO/MnO_2/PTTh) for supercapacitors. rGO/MnO_2/PTTh nanocomposites were characterized by the analysis of Fourier transform infrared-attenuated transmission reflectance (FTIR-ATR), Raman spectroscopy, and scanning electron microscopy-energy dispersion X-ray analysis (SEM-EDX), TGA-DTA, BET surface analysis, XRD, UV-vis spectroscopy. Electrochemical tests were taken by galvanostatic charge/discharge (GCD), cyclic voltammetry (CV) and electrochemical impedance spectroscopy (EIS) studies. Equivalent circuit model of R(QR) analysis and stability tests were performed for supercapacitors. The physical interpretation of equivalent circuit model and by considering the device physics [1].

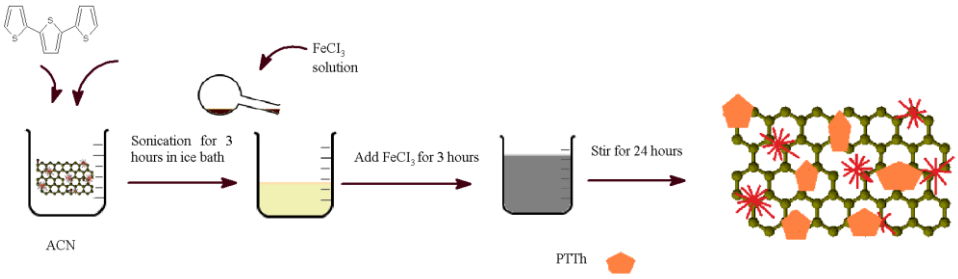

Figure1. Schematic image of a ternary rGO/MnO_2/PTTh nanocomposite.

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SYNTHESIS OF rGO/TIO$_2$/PEDOT NANOCOMPOSITES, SUPERCAPACITOR DEVICE PERFORMANCES AND EQUIVALENT CIRCUIT MODELS

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A new nanocomposite electrode incorporating poly (3,4-ethylenedioxythiophene) (PEDOT) within the nanocomposite film of the reduced graphene oxide / Titanium dioxide (TiO_2) has been synthesized to use supercapacitor devices. We used constant EDOT monomer for in-situ polymerization and different initial monomer concentration ratio of $[rGO]_o/[TiO_2]_o$=1/1, ½ and 1/5. The obtained nanocomposites were examined by FTIR-ATR, UV-vis, SEM-EDX, TGA-DTA, BET surface areas and pore distribution, XRD, TEM, CV, GCD and EIS analysis.

The results show that graphene oxide successfully reduced to rGO via microwave-assisted method. It is confirmed by the increases of specific capacitance of (C_{sp}= 652 F/g) at 1 mV/s for rGO/TiO_2/PEDOT nanocomposite at $[rGO]_o/[TiO_2]_o$=1/5. This situation is related to pore size (~33.50 nm) of the material for rGO/TiO_2/PEDOT at $[rGO]_o/[TiO_2]_o$=1/5 obtained from BET analysis. The other C_{sp} values are 475.33 F/g for $[rGO]_o/[TiO_2]_o$=1/2, 114.09 F/g for rGO/PEDOT and 48.02 F/g for $[rGO]_o/[TiO_2]_o$=1/1. Equivalent circuit model of $R_{ct}(C_{dl}R_{ct})$ was analyzed by ZSimpWin and TINA programmes. A facile and inexpensive approach for a ternary nanocomposite synthesis of rGO/TiO_2/PEDOT was presented for future supercapacitor applications.

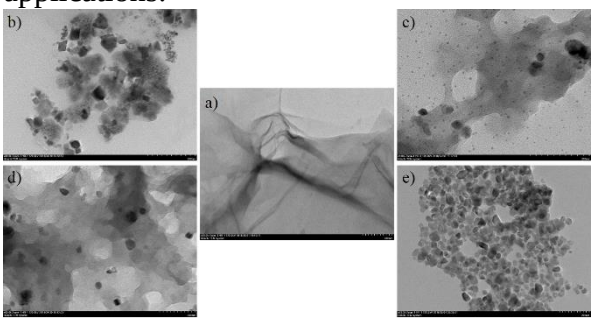

Figure 1. HRTEM analysis of **a)** rGO, **b)** rGO/PEDOT, rGO/TiO_2/PEDOT at **c)** $[rGO]_o/[TiO_2]_o$= 1/1, **d)** $[rGO]_o/[TiO_2]_o$= 1/2 and **e)** $[rGO]_o/[TiO_2]_o$= 1/5.

Acknowledgements: The authors gratefully acknowledge the financial support from TUBITAK, Project number: 117M042.

POLYMER-DISPERSED LIQUID CRYSTAL TECHNOLOGY

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Polymer-dispersed liquid crystal (PDLC) technology is the promising research area and there are new developments in this field [1]. These novel materials show great potential for application in displays and for solar energy control panels. PDLC materials are comprised of a polymer matrix sandwiched between two conductive transparent glass or plastic substrates. Nanometer sized LC droplets are dispersed in this polymer matrix. In the absence of electrical voltage, LC molecules have a random arrangement and incoming light rays are strongly scattered by the droplets. In this case, film appears milky white. When the voltage is applied, LC molecules align along the same direction and film becomes transparent. Thus the PDLC systems can be controlled by external applied fields. The PDLC technology had been invented in 1980s and development of this technology is the subject of both academic and industrial fields [2]. Smart windows are the most known topic and a lot of research is being done in this field. These switchable films can be used for architectural market, privacy and security applications as well as reflective displays. PDLC films typically blocks 99% of UV rays, which cause discoloration of interior walls and furnishings. In its opaque state, PDLC films can reduce solar heat gain in the summer months. Thus the reduced heat gain in hot months helps keep the interior cooler, thus reducing the energy spending costs. In this talk I will provide a brief review of developments in PDLC technology.

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3D PRINTED DIELECTRIC-SILVER INK HYBRID ANTENNA FOR WI-FI APPLICATIONS

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Additive manufacturing (AM), often called 3D printing has attracted a significant amount of interest in the past decade for manufacturing Wi-Fi antennas [1-2]. In this work, the design, fabrication and characterization of a 3D printed dielectric-metal hybrid patch Wi-Fi antenna is presented. The dielectric substrate of the antenna is fabricated by commonly used fused filament fabrication (FFF) technique. Then the radiator and the ground plane are formed by silver conductive ink (DGP80) coating. The figure-of-merits of the antenna including return loss, resonance frequency, bandwidth and SWR are measured within the standard antenna measurement setup. We also simulate the proposed antenna employing 3D full-wave EM solver CST with the known electrical properties of used PLA and silver ink (Figure.1). We show the great agreement between the simulation and experimental results, and the proposed antenna radiates at about 2.4 GHz, which successfully satisfies the requirements of today's Wi-Fi communication systems considering the return loss and bandwidth. Our work reveals that the proposed method can be used to fabricate low-cost, efficient and robust devices for a variety of RF applications.

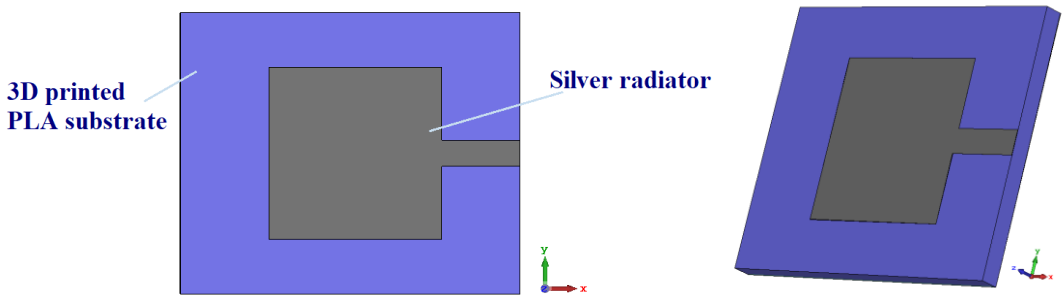

Figure.1: 3D view of the proposed antenna in CST

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DESIGN, SIMULATION AND FABRICATION OF A NOVEL DUAL-POLARIZED ORTHO-MODE TRANSDUCER

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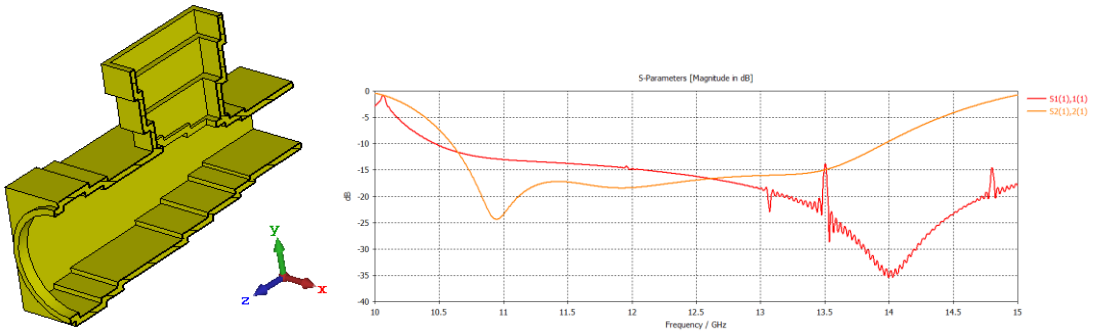
In this study, a novel waveguide based ortho-mode transducer (OMT) for dual-polarized satellite communications systems is presented. In the proposed design, step-type abrupt discontinuities are employed, and the vertically and horizontally polarized signals are successfully separated at the output ports. We simulate our design employing 3D full-wave EM solver CST (Figure.1-a), and show that the proposed OMT perfectly works for dual-band, 10.75−12.75 GHz and 13.75−14.5 GHz, respectively with a return loss below −15 dB GHz (Figure.1-b). Moreover, our design shows excellent isolation performance between the two output ports in both bands in comparison with the previous reports [1-2]. The proposed aluminium (Al) based design is then fabricated by using CNC fabrication technology. The simulation and experimental results are compared, and we show that our separable design is more simple, robust and easy-to-fabricate.



(a) (b)

Figure.1: a) 3D of the proposed design OMT b) S-parameter results

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ELECTRICAL AND OPTICAL PROPERTIES OF PHOTODIODE STRUCTURES FORMED BY SURFACE POLYMERIZATION OF P(EGDMA-VPCA)/SWCNT FILMS ON n-GaAs

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Poly (ethylene glycol dimethacrylate-1-vinyl-1H-pyrole-2-carboxylic acid) /carbon nanotube, single-walled)/n-GaAs ([P(EGDMA-VPCA)/SWCNT]/n-GaAs) photodiode structures was fabricated by using surface polymerization method. Electrical and optical properties were carried out at several temperatures. Dark and light current characteristics were investigated. Spectral photo response measurements of the structure are carried out at room temperature. The maximum open circuit voltage V_{OC} and short-circuit current I_{SC} values for the diode under 20 mW/cm^2 were found to be 0.52 V and 54.63 μA, respectively. Those were shown that the fabricated structure exhibited rectification behavior that makes it a good candidate for optoelectronic device applications.

ORAL PRESENTATION

EFFECT OF METHYLCELLULOSE AND CITRIC ACID CONCENTRATIONS ON THE RHEOLOGICAL PROPERTIES OF AN INJECTABLE HYDROGEL

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Over the last decade, the development of injectable hydrogel formulations for drug delivery and/or recruitment of cells to promote tissue regeneration gained great attention. Injectable hydrogels are formed using a variety of chemical or physical crosslinking techniques which must be carefully determined to meet the requirements of the specific application. One of the objectives of this study is to avoid use of any toxic crosslinking material, therefore methylcellulose was used as a thermo-responsive, in situ gelling polymer and citric acid was chosen as a non-toxic crosslinker to adjust the gelation temperature and time. Salts like citric acid are also capable of bringing down the gelation temperature to the physiological body temperature by the dehydration effect. Addition of other polymers also have the ability to reduce the gelation temperature of MC. To this end, gelatin was incorporated to lower the phase transition temperature and to enhance cellular adhesion via presented RGD sequence within gelatin structure. In this study, the influence of concentration of MC and sodium citrate dehydrates (SC) salts on the rheological properties of a thermo-responsive hydrogel was investigated. Synthesized hydrogel was characterized by using Fourier Transform Infrared Spectroscopy (FTIR) and Scanning Electron Microscopy (SEM). Subsequently, the effect of 1, 2 and 3 w/v % of SC and 6, 8 10 w/v % of MC on the gelation temperature was investigated by test tube tilting method (TTM). Time and temperature dependent variations of loss (G'') and storage (G') modulus and complex viscosity (Pa.s) of hydrogels were investigated by using oscillation rheometer. The sharp increase of G' and Pa.s indicates the gelation temperature and gelation time. The results show that gelation temperature was only reduced a few degrees when the MC concentration increased from 6 w/v % to 10 w/v %. Compared to the effect of increased MC concentration, the addition of SC to the MC/gelatin blend decreased the gelation temperature from 32°C to ~27°C. This is the effect of SC salts because the water molecules are attracted to the citrate ions. This depletion of water layer around hydroxyl groups of MC causes enhancement of hydrophobic-hydrophobic interaction between MC ions which leads to gelation therefore, the gelation temperature is reduced. There were no significant differences between gelation time of hydrogel samples for the prepared concentrations. In addition, the complex viscosity and gel strength clearly increased by incorporation of SC salts and increased MC concentration. To conclude, the injectable hydrogels are promising biomaterials for cell and drug delivery of recruitment for tissue regeneration. Therefore, the developed injectable hydrogel will also be investigated for cytotoxicity and for drug delivery capacity in the future work.

DOUBLE MODIFICATION OF ROMP POLYMERS INCLUDING PENDANT THIOLACTONE UNITS

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Two novel oxanorbornene monomers possessing pendant thiolactone group were prepared and polymerized by Ring Opening Metathesis Polymerization (ROMP). The resulting polymers (**P1** and **P8**) were then subjected to aminolysis reactions with propylamine in the presence of methyl acrylate to capture, *in situ*, the latent thiol giving thiol-Michael addition.

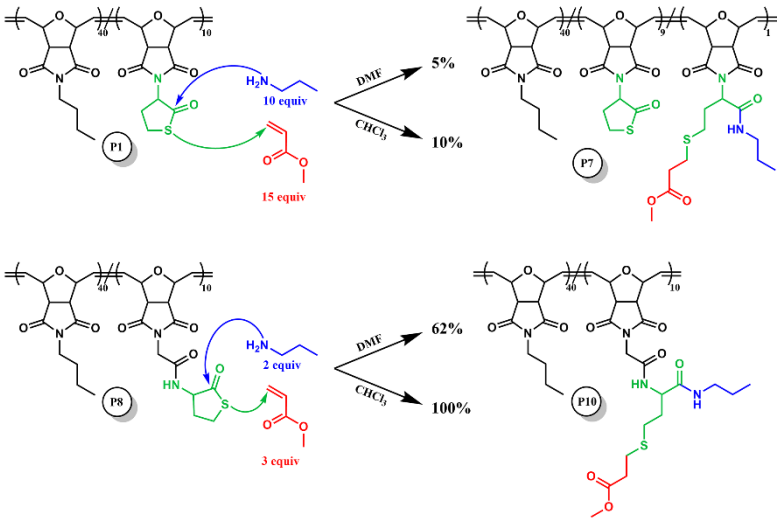

Figure: Illustration of double modification of two ROMP polymers.

One of the ROMP polymers, **P8** did efficiently undergo aminolysis as well as subsequent thiol-Michael addition reactions using propylamine whereas the other one, **P1** did not. Next, a variety of primary amine compounds was reacted with **P8** to test their reactivity toward the aminolysis reactions. All modified polymers were characterized by using conventional instruments such as GPC, NMR and DSC.

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CALIX [4] PYRROLE-MODIFIED SINGLE WALL CARBON NANOTUBES AND ACETONE SENSING PROPERTIES

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Noncovalent functionalization of Single-Wall Carbon Nanotubes (SWCNT) with a pyrene bearing calix [4] pyrrole was carried out efficiently. Pyrene was selected to achieve physically bonding of the calix [4] pyrrole on to the SWCNT owing to efficient π-π stacking.

Calix [4] pyrrole-modified SWCNT based sensor was implemented on filter paper. The resistance change of SWCNT upon the volatile organic compounds (VOC) exposure was monitored in the chemiresistors approach. The calix [4] pyrrole-decorated SWCNT sensor on filter paper was found to show fast and selective sensing of acetone when compared with pristine SWCNT-on-paper sensor due to the binding of acetone by calix [4] pyrrole molecules. The sensor showed logarithmic response toward acetone in a concentration range between 20–500 ppm.

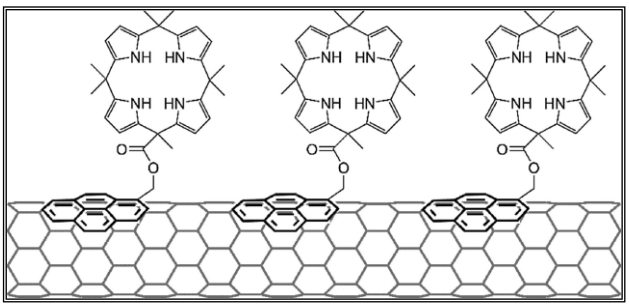

Figure: Illustration of calix [4] pyrrole decorated SWCNT

The modified SWCNT has been characterized by scanning electron microscopy, electron dispersive spectroscopy, and thermogravimetric analysis.

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NOVEL DENDRIMERS CONTAINING REDOX MEDIATOR: ENZYME IMMOBILIZATION AND APPLICATIONS

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Glucose oxidase is widely used as an analytical reagent in glucose determination, especially in enzyme electrode applications. Glucose oxidase needs flavin adenine dinucleotide (FAD) coenzymine, which it possesses as a catalyst. In the reduction reactions catalyzed by glucose oxidase, it acts as an FAD electron acceptor and is reduced to $FADH_2$. Generally, redox mediators are used for ensure more effective electron transport to the active center of the enzyme [1]. As a mediator, ferrocene (Fc) is a good choice due to its reversibility and generation of stable redox states.

Although glucose oxidase enzyme has attracted interests in the varying process, this enzyme is unstable due to its complex molecular structure. Therefore, a number of immobilization techniques have recently been investigated to improve its stabilities [2]. Dendrimers are “hot topics" of nanotechnologies like carbon nanotubes. The most important characteristics of dendrimers are their highly functionalized perfect surface, for enzyme immobilization [3].

In this work, Glucose oxidase (GOx) enzyme was immobilized on the dendrimers and optimum conditions for immobilized enzyme were determined. In addition, the use of immobilized GOx enzyme in the qualitative determination of glucose in synthetic urine has been studied.

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THE CONNECTION TYPES TO MINIMIZE LOSS OF GAIN BETWEEN LOW NOISE AMPLIFIER AND ANTENNA

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In this work, the low noise amplifier (LNA) is designed at the Rogers 4350 copper plate for Passive Millimeterwave Imaging System (PMMWIS). Some designs are done at 35 GHz frequency window which is specific frequency window for PMMWIS to detect targets for different air conditions, such as; fog, rain, dusty air. The antenna which will be connected to the LNA should be designed at the copper plate. It is the most convenient connection to get minimum loss because of being at the same plate. However, other types of connections for LNA and antenna have also been studied.

One of the connector type is 2.92 mm connector. The LNA can be connected to the micro strip antipodal Vivaldi antenna or Vivaldi fed antenna with 2.92 mm connector. The LNA output has female pins and the antenna input has male pins. So that, they can be connected each other. Both the LNA and the antenna are on the same type of plate, but they are designed separately to be able to measure one by one. As a result; there are some attenuation at the connection point. Another investigated type is a wave guide to micro strip converter. The LNA can be connected with horn antenna but the horn antenna has WR28 standart to work at Ka band (35 GHz frequency band). Consequently; if the antenna connects to the LNA, it has to be converted to the wave guide. The system can work in this situation but the attenuation may be more than the others.

In the passive imaging, the attenuation of the connections can be neglected if the gain is enough to be able to get the images and see the figure on computer screen. In this study, the comparison of attenuation between low noise amplifier and antenna is analyzed for each case. Finally, the connection types of the LNA and the antenna are chosen.

Keywords: antenna, loss of gain, low noise amplifier

LINEAR PREDICTIVE CODING IN MATLAB TO COMMUNICATE WITH ZIGBEE

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One of the popular wireless communicating technology which is ZigBee is studied in this work. It has 802.15.4 wireless communication protocol in the literature. XBee brand transmitter and receiver modules are used to fulfill the requirements of ZigBee. The transmitter XBee is connected to the computer and the receiver XBee is connected to the motors located on Arduino 15 meters away. This system already communicates wirelessly, as a second wireless communication tool, MatLab voice recognition algorithm is introduced into the system. The linear predictive coding (LPC) algorithm, which is the base of this study, is one of the most important methods for voice recognition. By means of this algorithm, the commands will be transmitted to the transmitter XBee by sound, not by pressing the keys of the PC. The LPC takes into account the sound properties as well as the human larynx and mouth structure. LPC is based on the output of a linear and time-varying system, which is stimulated by periodic impulses or random noise. This system can be expressed as a linear filter transfer function. The inverse Z transform is applied to this transfer function. The LPC works with the principle that the next sample can be approximated from a previous sample.

The voices of the same person were recorded and embedded in the MatLab Program. The test was 100% successful with the same user. However, voice recordings were taken from different people so that the system could be controlled by other users. When sampling voice records of different persons, several samples were taken to increase the accuracy rate. The success rate was around 80% when different matrices composed of different people's voices were used. MatLab codes were developed to provide the best performance. The external microphone, was used when the voice command for servo motor control was given and the commands were embedded firstly in the program. At the end, the user can control the servo motors with appropriate commands wirelessly. The first wireless communication is ZigBee communication, here XBee, and the second wireless communication is voice commands through MatLab Program.

Keywords: Communication, Linear Predictive Coding, ZigBee

FIRST RESULTS OF RAYLEIGH SCATTERING METHOD TO DEFINE SIZE OF CLUSTER IONS IN A GAS DETECTOR

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In gas detectors, ions have undesirable effects on the operation of the detector. They affect on signal through electromagnetic induction and break the surrounding electric field configuration by coming together in the drift area. Especially this problem is discussing on board of groups which are working on big volume gas detectors at CERN. In fact, numerous attempts have been made to solve such problems, but none of these approaches have been successful. As an accepted approach, it is very important to determine the behaviour of ions in the detector. However, we have proved that the ions are converted into ionic clusters until reaching the cathode. We have done shows the presence of ionic clusters including one or two atoms or molecules, but some scientists argue that hundreds of atoms or molecules can form ionic clusters. As a result, knowing the size of the ionic clusters will lead to a more comprehensive understanding and solutions that will be introduced in this direction.

This work suggests a different way to define ions in a gas detector namely Rayleigh scattering method. Laser beam (532 nm), is sending to the drift area where the cluster ions are forming. Laser scattering on the ions and the scattered light detecting by a PMT (Hamamatsu H11901-110). So, the dimensions of the cluster ions in detector can be determined by using and analysing intensity of scattered light. First time, cluster ions are defining in a gas detector during the natural operation of the detector. Aiming to find answers to some important questions about cluster size and its behaviour.

FABRICATION AND CHARACTERIZATION OF ORGANIC FIELD EFFECT TRANSISTOR BASED RADIATION DETECTOR

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Recently, MOSFET devices generally have been used as a dosimeter. Shifting of threshold voltage on MOSFET allow to be used as a dosimeter for semiconductor devices [1]. Nowadays, it has been showed that organic field effect transistors (OFET) can be used as dosimeter. Because of the easy production and flexibility of OFETs can take MOSFETs place in this context. In this study OFETs have been fabricated on the flexible substrates and characterized under X-Ray source. Shifting threshold voltage of OFETs were measured as a function of dose.

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COMPRESSIVE STRENGTH OF CONCRETE CONTAINING DIATOMITE UNDER THE EFFECT OF SODIUM CHLORIDE BY ANN

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In the world, concrete is an important role to play in construction technology. Different kinds of cements and pozzolans have been used in concrete technology. Diatomite, which is a natural pozzolan, is abundant in our country. Besides this, expert systems, which are Adaptive Network-based Fuzzy Inference Systems (ANFIS), fuzzy system, artificial neural network (ANN), and so on, have been used to solve a wide variety of problems in civil engineering applications by many researchers.

In this study, two ANN prediction models were designed to investigate the behavior of concrete containing diatomite under the effect of sodium chloride. Three different mixes of the 28, 56 and 90 hydration days compressive strength experimental results of concrete containing diatomite used in training and testing for ANN systems was gathered from the experiments to construct this model. The data used in the ANN models are arranged in a format of six input parameters that cover the days (age of samples), Portland cement, diatomite, aggregate, water and hyper plasticizer and an output parameter which is compressive strength of concrete.

In these models, results of the train and test results imply that our artificial neural network models have strong potential as a feasible tool for predicting 28, 56 and 90 hydration days' compressive strength of concrete containing diatomite under the effect of sodium chloride.

Keywords: ANN, concrete, sodium chloride, diatomite, compressive strength

EFFECTS OF SODIUM CHLORIDE ON CONCRETES SUBSTITUTED ZEOLITE AND DIATOMITE

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Cement and pozzolans have become common building materials in today's fast developing construction sector. Due to economic and ecological factors, natural pozzolanic materials like zeolite and diatomite are intensely used in the cement and concrete technology.

In this study, it is tried to state the physical and mechanic characteristics of the concrete produced with diatomite and zeolite substitution in which Turkey is quite rich. This study was designed to investigate the behavior of diatomite under the effect of sodium chloride (NaCl). In the purpose, Portland cement, 5+5% and 10+10% diatomite and zeolite, which were substituted for Portland cement, a total of 3 different cements have been used. 15x15x15 cm cube samples have been made for each concrete group which was produced with these cements and this makes totally 54 units. While preparing the samples for the study, a mix design have been done (the amount of subsidence is between 7-10 cm). On samples of produced hardened concrete unit weight, water absorption, porosity, ultrasonic velocity, capillary water absorption and compressive strength experiments have been done. Hardened concrete tests have been done on three different types of concrete, for 28 days, in 23±2 ºC water, then on the concrete samples which are cured NaCl of the media factor and in the level 2 (56 and 90 days) of concrete age factor.

As a result, it was determined that the compressive strength, capillary water absorption, ultrasonic velocity, porosity, water absorption and unit weight of the cured concrete specimens were in coherent with each other.

Keywords: Zeolite, diatomite, sodium chloride, capillary water absorption, compressive strength.

MEASUREMENTS OF OUTDOOR GAMMA DOSE RATE AND ANNUAL DOSE CALCULATION FOR IDA VILLAGES, STATED AROUND EDREMIT&AYVACIK DISTRICTS; BALIKESIR&ÇANAKKALE, TURKEY

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Main focus of this study is to measure outdoor gamma dose rates for IDA villages around Edremit and Ayvacık districts. Total measurings, the outdoor gamma dose rates on 75 different stations, were obtained for the dose rates, then calculated the annual dose. Average dose rate was calculated to **163.62 nGyhr^{-1}**. Annual dose is **200.66 µSv.** These values were compared with the World's references (UNSCEAR) and assumed. This study would be referenced for futher works, besides it will be usefull while comparing with the different studies for IDA which, will be completed in the future, for example after a radioactive pollution, such as a reactor leakage, weapon's effect, etc., too.

Keywords: Radioactivity, ADRA, AEDE, air, Outdoor gamma dose, Mount IDA.

SURVEILLANCE FOR NUCLEAR ELECTRONICS AT A GLANCE

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Nuclear Electronics is an important discipline of ELECTRONIC Science. Besides after radiation interacts to the detector material, electron which handled direct or indirect, is important to determine the energy level and intensity. There are a few solutions for these determinations. Since 1969, that's were applied by modular devices such as high voltage supplier, amplifier, discriminator and scaler, etc due to NIM standards. 1971, CAMAC was standardized. Last in 1979, VERSA was definated. Nowadays, all in one technology is preferred especially for NIM versions stated in detector systems.

Keywords: Radiation, Electron, Signal Processing, NIM, CAMAC, Versa, Detector

ANNUAL DOSE DETERMINATIONS IN DRINKING WATER AND AIR, FOR COSTAL COUNTIES CLOSEST TO SYRIAN BOARD OF TURKEY

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Hatay province has 15 counties and some of them is near seaside as Iskenderun, Arsuz and Samandag. All that three counties has high population due to jeopolitics and economics. By this study, water and air quality was assessed via calculation of annual dose. Average activities of gross alpha for Iskenderun, Arsuz and Samandag are 21.5, 25.5 and 41.4 mBq/L and gross beta 52, 53 and 73 mBq/L. Annual doses were calculated to 4.4, 6.24 and 8.47 **µSv** for **gross alpha** and 26.20, 26.67 and 36.77 **µSv** for **gross beta.** Air **dose rate** measurements were obtained to 50.64, 33.85 and 43.74 **nGy/h** for Iskenderun, Arsuz and Samandag consequently. Annual doses are assessed to 62.15, 41.51 and 53.64 **µSv.** These values were compared with the World's references (UNSCEAR) and assumed. This study would be referenced for futher works, besides it will be usefull while comparing with the different studies for same regions which, will be completed in the future, for example after an attack from Syrian board, radioactive pollution, such as a reactor leakage, weapon's effect, etc., too.

Keywords: Radioactivity, Outdoor gamma dose, AEDE, Iskenderun, Arsuz, Samandağ.

CIVIL ARCHITECTURE OF EXAMPLES IS IN TARAKLI AND HALİM DÜZGÜN OF HOME'S PROJECTS AND RESTORATION STUDIES

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It is an important settlement area where our cultural heritage is present with the examples of Ottoman architecture coming from past to day. For an effective restoration of the monumental and civil structures that Taraklı possesses, the physical structure is examined together with its historical, architectural values and surroundings.

In this study, the materials used in the construction of the works are provided and constructed during the historical development process, and the changing conditions are determined as the principle of their effect on these works. Architectural settlements, interior layouts, construction systems, features of the roofs, and number of floors of civil buildings are suitable for personal purposes. Monumental constructions are great works of social quality and there is a history story of the society in these structures. Restoration projects of the chosen Halim Düzgün House have been prepared and investigated in terms of necessary protection interventions without deteriorating the original texture.

The restoration works of Halim Düzgün House have been completed by carrying out the analysis studies supported by the projects and pictures and by performing the controls under the necessary supervision without deteriorating the originality of the techniques applied in the application.

ENVIRONMENTALLY FRIENDLY IONIC LIQUIDS AS BULK LIQUID MEMBRANES: A DESIGN STUDY OF PROPIONIC ACID REMOVAL

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Propionic acid is mostly used as a preservative and flavoring agent in food industry. It is also used to prevent mold in breads and cakes and used as an additive in animal feed and grain. Besides, propionic acid is used as a chemical intermediate for the manufacturing of pharmaceuticals, cosmetics, perfumes, dyes, textile and rubber, plastics, herbicides [1]. Environmentally friendly ionic liquids are known as green solvents because of their important environmental features. They are considered as an alternative to conventional volatile organic solvents in different applications. The conventional volatile organic solvents cause environmental pollution because of their features including toxic, volatile and flammable [2].

In this study, environmentally friendly ionic liquids have been used as a bulk liquid membranes for the removal of propionic acid from aqueous solutions. Bulk liquid membrane (BLM) is one type of liquid membrane including feed, stripping and membrane phases. Removal of targeted material is carried out due to the diffusivity and solubility between these phases. In this work, ionic liquids, 1-Butyl-3-methylimidazolium hexafluorophosphate [BMIM][PF6], 1-Hexyl-3-methylimidazolium bis (trifluoromethylsulfonyl)imide [HMIM][Tf2N] were used as the membrane phase. In order to determine various parameters affecting BLM, a design study was performed. In these experiments, Tributyl phosphate was used as a carrier (0-2 mol/L) in the membrane, and NaOH solutions (0-3 N) were used as a stripping phase respectively. As a result, this design study indicated that environmentally friendly ionic liquids as bulk liquid membranes can be used on propionic acid removal.

Acknowledgement: This study was funded by İstanbul University with the Project Number BYP-2018-31279.

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NONLINEAR ANALYSIS OF BURIED PIPES UNDER THE STATIC LOADS

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Buried pipes are important infrastructures used to transport water, energy and other critical utilities. The first step in the design of a buried concrete pipe is the determination of the overburden earth and live loads that will act on the pipe installation. They should be designed properly to withstand the loads imposed by the backfill soil weight and traffic loads. Fine-grained silty-clay soil may be an alternative backfill when relative high quality coarse-grained soil is absent in-situ or difficult to transport from a long-distance away in urban areas. In this study, a numerical model was developed for concrete buried pipe in low plasticity silty-clay soil using PLAXIS 2D validating design parameters using high-quality field data collected from the literature. The internal diameter of the pipe inner diameter is 750 mm, outer diameter is 900 mm and burial depths varied from 1.1 to 2.6 times the diameter of the pipe. The effect of the pipe stiffness, loading and soil conditions on the maximum displacement of buried pipe has also been investigated using Mohr-Coulomb soil model. A model section was subjected to uniform traffic load, representing a worse case loading scenario. A general increase of stresses with burial depth and traffic loads were computed by finite element (FE) analyses. Analysis results indicated that the uniform traffic load and burial depth have significant effect on the stresses and displacements. The negative soil arching induced in the backfill material and at the top or spring-line of the pipes increased with an increase of the soil cover thickness. The FE modeling employed in this study is sufficient to simulate the performance of the concrete pipe in low plasticity silty-clay backfill conditions.

MORPHOLOGY AND CHARGE-MOBILITY OF LONG ALKYL SIDE-CHAINED BTBTS

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We calculate the charge-transport of an organic material, benzothieno-benzothiophene (BTBT), by changing the size of side-chains and aim to understand side-chain dependence. The reported experimental hole mobilities typically fall within the range of 1-100$cm^2V^{-1}s^{-1}$, therefore we employ both band transport models using deformation-potential theory based on DFT-D3 methodology and hopping transport using kinetic Monte Carlo simulations employing Marcus–Levich–Jortner charge-transfer theory. Band transport calculations are performed in an ordered structure whilehopping transport calculations are performed for both ordered and disordered structures based onmolecular dynamics simulations.We find that intrinsic mobility in BTBTs is critically controlled by the alkyl chain length; typically, longer alkyl side-chains regulate intrinsic disorder, cause improved balance betweendifferent transport directions and, ultimately, lead to enhanced charge-carrier mobility [1].

Keywords: BTBT, charge mobility, side-chains.

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THERMOFORMING OF A POLY (LACTIC ACID) SHEETS PRODUCED BY 3D PRINTING

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In this study, initially Poly Lactic Acid (PLA) sheets were produced in proper dimensions by 3D printing. These sheets were thermoformed with a lab-scale thermoforming machine. The optimal production parameters for PLA were investigated. Temperature distribution on heaters and heated sheet were measured by using a Thermal Imaging Camera. Heating of a PLA sheet simulated by using a FEA software. Simulation results compared to thermal images. Results show that non-isothermal temperature distribution occurred after heating. Forming of PLA sheet was also simulated. Thickness distributions through some directions on the thermoformed product were obtained and predicted. Calculated and obtained results compared to each other. As a result, thickness variation results show slightly agreement.

Keywords: Thermoforming, Poly Lactic Acid (PLA), Thickness, Temperature, Simulation.

3rd International Conference on Organic Electronic Material Technologies (OEMT2018)
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SYNTHESIS AND PROPERTIES OF MACROMOLECULAR STRUCTURES BASED ON TRIAZINE

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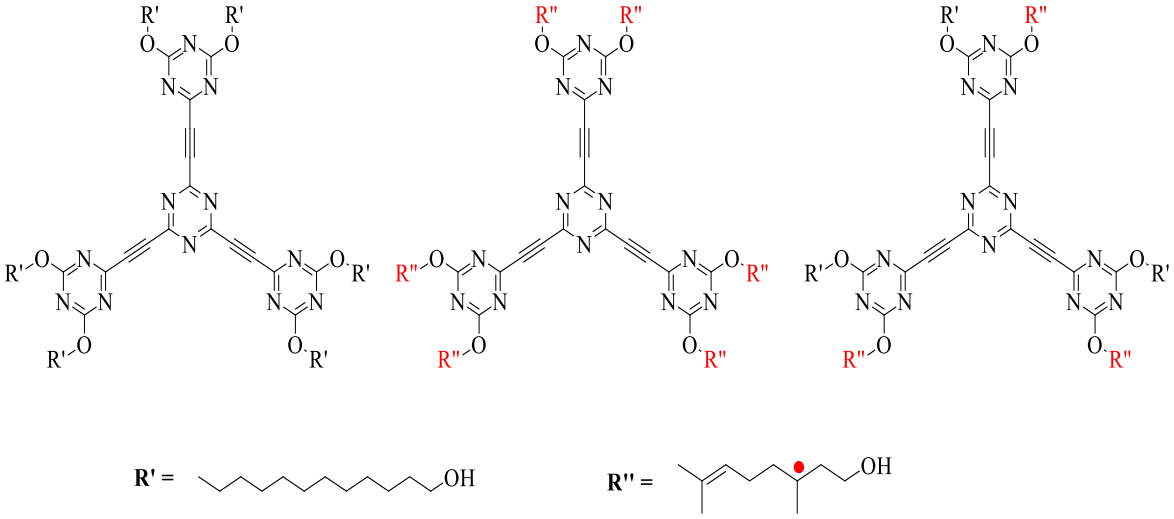

Figure 1: Macromolecular Structures Based on Triazine

We designed several series of triazine-based macromolecular molecules in order to investigate their liquid crystalline properties. Since triazine is known to have a good electron transporting properties we decided to investigate the structure-activity relationships on the newly designed and synthesized macromolecus containing triazine unites in center or on the periphery of the molecules as seen in Figure 1.

Tri-armed macromoleculs contain triazine in the center and the chiral an achiral alkoxy groups provide soft tails. Synthesis and properties of the designed macromolecules will be presented.

Acknowledgement: Authors acknowledge funding from TUBITAK. Project No 114Z722.

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SYNTHESIS, ANTIMCROBIAL AND ANTIMUTAGENIC EFFECTS OF NOVEL POLYMERIC-SCHIFF BASES INCLUDING INDOL

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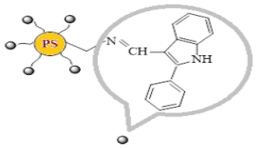
Polymeric Schiff bases are an important class of coordination polymers, which have multidentate donor sites or groups and known to form polychelates with transition metal ions readily. The basic properties of Schiff base polymers are due to the linkage of azomethine group (C=N) in the polymeric backbone. Schiff bases are intensively studied because of their analytical and biological applications [1]. Antimutagen is a biological term for the compound that eliminates mutation process [2]. Recently, there has been an increase in mutation-related diseases, therefore the discovery of new antimutagens is become important. The purpose of the research was to synthesize novel polymeric Schiff bases containing indol and to evaluate the antimicrobial and antigenotoxic properties of Schiff base attached polymers.

The synthesis of two polymeric-Schiff base (**L_1**, **L_2**) was reported by us [3]. Herein, a novel polymeric-Schiff base including indol (**L_3**) was synthesized from condensation of (aminomethyl) polystyrene and 2-phenylindole-3-carboxaldehyde and was characterized using elemental analyses, FT-IR, GPC and TGA analyses.



Then, all Schiff base attached polymers (**L_1**, **L_2**, **L_3**) were examined *in vitro* for antimicrobial activity against some pathogenic strains (*Listeria monocytogenes 4b, Salmonellatyphi H, Bacillus cereus sp., Staphylococcus epidermis, Micrococcus luteus, Escherichia coli, Staphylococcus aureus, Brucella abortus, Proteus vulgaris, Klebsiella pneumonia*) and antifungal activity against *Candida albicans*.Additionally, (**L_1**, **L_2**, **L_3**) were investigated against sodium azide in human lymphocyte cells by micronuclei and sister chromatid exchange tests for antimutagenic properties.

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BIOSYNTHESIS OF GO: SE NANOPARTICLES USING AS THIN FILMS AND GO: SE /P-SI DEVICE APPLICATION

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In recent years, researchers are concentrating on use of microorganisms as "nanofactories" for production of metal nanoparticles. In this research simple, ecofriendly, low cost and a new approach are used for deposition **GO: Se** thin film. Graphene oxide nanoparticles (GO: Se-NPs) have been synthesized by using *Pseudomonas aeruginosa* and *P aeruginosa* strain OG1 in Luria-Bertani medium under aerobic conditions. Biosynthesized GO: Se-NPs solution dropped on glass and p-Si substrates and then they annealed for the formation thin film structure. Band gap of GO: Se thin film investigated by using UV-Vis. Spectrophotometer method. Obtained GO: Se/p-Si structure characterized X-ray diffraction (XRD), Field-emission scanning electron microscopy (FE-SEM) with energy dispersive X-ray spectroscopy (EDS) and X-ray photoelectron spectroscopy (XPS) techniques. Some electrical parameters of GO: Se/n-Si structures are investigated with Current-Voltage (I-V) measurements at room temperature.

Keywords: GO: Se, Pseudomonas Aeruginosa, Thin Film, Nanoparticles

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GREEN BIO-CHEMISTRY APPROACH FOR FABRICATION OF GO: CU/P-SI DEVICE APPLICATION

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Microbial production of nanoparticles is a green chemistry approach that interconnects nanotechnology and microbial biotechnology. Among the bacteria, Pseudomonas aeruginosa is unique to tolerate high chemical concentration. Graphene oxide nanoparticles (GO: Cu-NPs) have been synthesized by using special bacteria under aerobic conditions. The synthesized GO: Cu-NPs solution dropped on glass and p-Si substrates and then they annealed. Optical properties of the GO: Cu thin film have been investigated by UV-Vis. Spectrophotometer method. Fabricated GO: Cu/p-Si structure characterized X-ray diffraction (XRD), Field-emission scanning electron microscopy (FE-SEM) with energy dispersive X-ray spectroscopy (EDS) and X-ray photoelectron spectroscopy (XPS) techniques. Some electrical parameters of GO: Cu/n-Si structure are investigated with Current-Voltage (I-V) measurements at room temperature.

Keywords: GO: Cu, Pseudomonas aeruginosa, thin film, nanoparticles

INVESTIGATION OF EFFECTS OF SOME DIE MATERIALS ON COATING THICKNESS BY CHANGING THE TIME OF GALVANIZING

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One of the most effective methods for preventing surface corrosion of metal materials is galvanizing, also called zinc coating. In the galvanizing method, the layer thickness to be formed on the material surface changes depending on the time and it affects the surface characteristics. Depending on the time and material characteristics, the coating thickness changes during the surface modification and affects the mechanical properties of the material. In this study, CK45, Sverker 21 and 1.2379 which is used in the molding technology, were galvanized for various periods of time using the material galvanizing method. Surface characteristics of coated materials were investigated.

Keywords: Galvanizing, temperature, coating time, surface coating, surface characterization.

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LUMINESCENCE CHARACTERIZATION OF YTTRIUM STANNATE PHOSPHORS

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Dysprosium (Dy), terbium (Tb) and europium (Eu) doped yttrium stannate ($Y_2Sn_2O_7$) phosphors were prepared by conventional solid-state synthesis method. The prepared phosphor samples were characterized by powder X-ray diffraction (XRD) and photoluminescence analysis. The prominent electronic transitions corresponding to doped Tb, Eu and Dy rare earth ions were monitored in the PL spectrum. Red emission arising from the hypersensitive Dy doped phosphor have luminescence emissions with dominating transitions at $^4F_{9/2}\rightarrow{}^6H_{9/2,}$ $^4F_{9/2}\rightarrow{}^6H_{11/2,}$ $^4F_{9/2}\rightarrow{}^6H_{13/2}$ and $^4F_{9/2}\rightarrow{}^6H_{15/2}$. The photoluminescence emission spectrum shows that the series of the emission-state $^5D_4\rightarrow{}^7F_j$ (j=6, 4 and 3) with regard to the typical 4f→4f intra-configuration forbidden transitions of Tb^{3+}. The major emission peak of the $Y_2Sn_2O_7$: Tb phospor is around at 542 nm. There are essentially multiple emission lines at each of the phospors because of the crystal field splitting of the ground state of the emitting ions. $Y_2Sn_2O_7$: Eu phosphor indicated strong and dominant emission peaks located at 580–650 nm corresponding to the $^5D_0\rightarrow{}^7F_1$, $^5D_0\rightarrow{}^7F_2$, $^5D_0\rightarrow{}^7F_3$ and $^5D_0\rightarrow{}^7F_4$ transitions. The $Y_2Sn_2O_7$ phosphor is a convenient host materials for rare-earth ion doped because of having sharp emission properties.

Keywords*:* Photoluminescence, Yttrium Stannate, Rare Earth Elements.

MEASUREMENT OF RADIOACTIVITY IN BEACH SANDS

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Radiation and radioactivity in the environment arise from the natural and man-made sources [1]. About 86% of the total radiation dose are from natural radioactivity, whereas 14% is from anthropogenic sources [2, 3]. Only natural radionuclides with half-lives comparable to their corresponding decay products existing in terrestrial material such as ^{232}Th, ^{238}U, ^{235}U, ^{226}Ra, ^{228}Ra and ^{40}K are of great interest. The levels of these radionuclides are relatively distributed in soil based on the nature of its geological formations [4].

In this study, natural and artificial radioactivity measurements in the Çeşme beach sands of in İzmir were investigated in order to evaluate the radioactivity pollutions. The radioactivity concentrations of ^{40}K, ^{238}U, ^{232}Th and ^{137}Cs radionuclides in the beach sand samples were measured by a NaI (Tl) gamma spectrometer system. In addition, the external terrestrial gamma dose rate in air (nGy h^{-1}) and annual effective dose rate (mSv y^{-1})) were calculated and compared with international standard values.

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INVESTIGATION OF THERMALLY STIMULATED LUMINESCENCE KINETIC PARAMETERS OF UV IRRADIATED YTTRIUM NIOBATE

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Thermally stimulated luminescence (TSL) kinetic characterizations of UV irradiated yttrium niobate ($YNbO_4$) based phosphors synthesized by solid state reaction using homogeneous mixture composed of Nb_2O_5, Y_2O_3 and Na_2SO_4 as flux are reported. The TSL glow curve of yttrium niobate crystals showed glow peaks at 366 and 424 K with a heating rate of 2 Ks^{-1} have been clearly observed by excited phosphor using UV radiation. In the present study TSL kinetic parameters, namely the kinetic order (b), trap energy (E) and frequency factor (s) belonging to the main glow peak (424 K) of the $YNbO_4$ phosphor were investigated after exposure to UV radiations using Chen Peak Shape, various heating rates and glow curve deconvolution (GCD) methods. Trap energies of the phosphor by VHR, PS and CGCD methods were calculated as 1.24, 1.11 and 1.14 eV, respectively. The frequency factors obtained by the methods were acquired as $3.41x10^{11}$, $1.80x10^{10}$ and $2.63x10^{10}$ s^{-1}, respectively. The results attained by all methods are discussed and compared.

Keywords*:* Yttrium Niobate, Thermally Stimulated Luminescence, Kinetic parameter

THORIUM (IV) IONS ADSORPTION ONTO MgO NANOPARTICLES PREPARED WITH COMBUSTION SYNTHESIS; MODELLING AND OPTIMIZATION USING RESPONSE SURFACE METHODOLOGY (RSM)

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Thorium in the earth's crust is three times more abundant than uranium. Thorium-232 is long-lived with a suite of radioactive daughter products which can pose a human health and ecosystems risk [1]. Although direct toxicity of thorium is low because of its stability at room temperature, since the liquid wastes of these industrial applications may leak to the surface and can mix with the underground waters, it is increasingly becoming a concerning environmental issue [2]. Todays, one of the most significant developments in material science is nanotechnology. Nanomaterials have got the features of big surface area, high specificity, extreme reactivity potential for self-assembly and high adsorption capacity for water treatment applications [3]. Nano-sized metal oxides are highly active for a large number of reactions that are important in both pollution control and chemical synthesis [4].

In this study, MgO nanoparticles were made for the adsorption of Th (IV) from aqueous solutions. The obtained MgO nanoparticles were characterized by FTIR, XRD and SEM. The adsorption of Th (IV) by particle was optimized with RSM. Under optimum conditions, the adsorption capacity of MgO nanoparticles was found to be 228.1 mgg^{-1}. In addition, the adsorption isotherms and the thermodynamic parameters was examined.

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MODELLING, ANALYSIS AND OPTIMIZATION of STRONTIUM (II) IONS ADSORPTION ONTO NANO-ZnO/CHITOSAN BIO-COMPOSITE BEADS WITH RESPONSE SURFACE METHODOLOGY (RSM)

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Many activities dealing with radioactive materials produce of radioactive wastes which require advanced treatment [1]. The removal of heavy metals and nuclear wastes in waste waters in terms of environmental protection is an important problem. Because heavy metals are harmful to the environment and human health due to their high toxicity even at low concentrations, and their long half-lives [2]. Strontium is an important nuclear fission product, contained in the radioactive waste of liquid effluents. Sr does not cause a significant health hazards at the stable forms while Sr-90 is not a stable isotope. The presence of Sr-90, even with low concentration in the aqueous effluents represents a serious concern. Because it constitutes a radiological threat of bio-toxicity to the organic matter. This is due to its long period of half-life (*30 years) and to its great solubility in the aqueous system. Thus, Sr-90 emitting beta particles is referred to as a ‘‘bone seeker’’ and exposure to it will increase the risk for several diseases including bone cancer, cancer of the soft tissue near the bone, and leukemia [3].

In this study, Nano-ZnO/Chitosan bio-composite beads were prepared for the sorption of Sr (II) from aqueous media. The resulting nano-ZnO/CTS bio-composite beads were characterized by TEM, XRD etc. The sorption of Sr (II) by biocomposite beads was optimized using RSM. The correlation between four variables was modelled and studied. According to RSM data, correlation coefficients (R^2 = 0.99) and probability F-values ($F = 9.07\times10^{-16}$) show that the model fits the experimental data well. The results indicate that nano-ZnO/CTS bio-composite beads are appropriate for the adsorption of Sr (II) ions from aqueous media. Also, the suitability of adsorption values to adsorption isotherms was researched and thermodynamic data were calculated.

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NANOTECHNOLOGY APPLICATIONS IN FOOD PACKAGING

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Nowadays, awareness of consumers about food safety and quality has led to an increase in consumer demand for food that has remained fresh for a long time and is not quickly disturbed. As a result, the importance given to food packages consisting of containers, cases or wrappers made from special materials such as metal, glass, paper, plastic which protects food from external influences and facilitates consumption has increased. In the packaging industry, environmental pollution caused by their wastes has become an important problem today, although petroleum-based plastics, which are used frequently from past to present, have features such as low weight, flexibility, durability and possible recycling. Recent studies on these and similar reasons have focused on packaging produced with nanotechnology. Nanotechnology involves the reduction of materials to dimensions of 100 nm or less, their characterization and analysis. In the food industry, nanotechnology applications are often used for purposes such as improving the barrier properties of packaging materials and making active and intelligent packaging materials more functional. Monitoring of the product during transport and distribution, thanks to packaging with nanoscale material, is among the active and intelligent packaging applications of nanotechnology. Among these applications, active packagings containing nanocomposite films obtained by the addition of nanoparticles are widely used in the food industry. The recyclability and biodegradability properties of nanocomposite packages are expected to contribute greatly to the reduction of environmental packaging waste quantities. The packaging obtained through nanotechnology takes the place of traditional packaging thanks to the important advantages it provides and is the subject of many new researches. In this study, information about using of nanotechnology applications in the production of food packaging is given.

Keywords: Nanotechnology, intelligent packaging, nanocomposite, food packaging

USAGE POSSIBILITIES OF BIOSENSORS IN FOOD TECHNOLOGY

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Biosensor is a progressing interdisciplinary research between analytical chemistry, biology and microelectronics [1]. Biosensors act as analytical devices employing a biological material or biomimic as a recognition molecules integrated within a physicochemical transducer or transducing microsysytems [2]. A biosensor can be defined as an integrated receptor transducer device, which is capable of providing selective quantitative or semiquantitative analytical information using a biological recognition element [1].

With the biosensors, the target analyses can be done with highly specific and highly sensitive. It is very easy, fast and economical to use compared to other measurement systems [3]. Biosensors research is booming around the world and the area of applications range from medical to agriculture. The types of instruments required for the agro-food diagnostics market can be divided into large multi-analysers, bench-top portable instruments and one-shot disposable sensors [2].

The use of biosensor in the food industry is to detect the food component or to detect the presence of microorganisms. Different types of biosensor are there on the basis of technique use with them optical biosensor, impedance biosensor, fluorescence label biosensor etc. [4]. Biosensors can be classified by either their receptor system (e.g. enzymatic, immunological, cellular) or by their transducing sytem (e.g. potentiometric, amperometric, optical, thermal or mechanical) [5]. In this study, some information was given about the use of biosensors in food technology.

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SYNTHESIS, CARACTERIZATION, COMPUTATIONAL CALCULATIONS & BIOACTIVITY OF 3-BIPHENYL-4-IMINO-SULFAHYDANTOIN

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Imidazolidine-2,4-dione (hydantoin) has beed named hydantoin skeleton. It is extremely important structure both in terms of organic chemistry and medicinal. When the sulfonyl (-SO_2-) group passes instead of the central carbonyl group between the nitrogens, Sulfahydantoins (1,2,5-thiadiazolidine-3-one 1,1-dioxides) are obtained. They have shown potential to treat diseases such as emphysema and inflammatory rheumatism by inhibiting serine proteases [1]. It has also been specified that this structure also acts as a hypertensive blocker, artificial sweetener and histamine H_2-receptor antagonist [2]. If the 3-imino group is replaced for 3-oxo in the sulfahydantoin core, the obtained 3-imino sulfahydantoin compounds show similar bioactivity properties, too. In addition, 3-imino sulfhydantoin compounds tend to convert to 3-amino 1,2,5-thiadiazole 1,1-dioxide structure by tautomerizing in solid form [3].

In this study, 3-([1,1'-biphenyl]-4-yl)-4-imino-1,2,5-thiadiazolidine 1,1-dioxide (**BIT**) (Fig.1) has been synthesized and characterized by FT-IR, ^{13}C NMR, ^{1}H NMR, LC-MS and UV–vis spectroscopic techniques. Molecular geometric of the BIT in the ground state, vibrational frequencies, electronic absorption spectra and Gauge Including Atomic Orbital (GIAO) ^{1}H and ^{13}C NMR chemical shift values have been calculated by using the Density Functional Theory (DFT) method with 6-311++G(d,p) basis set. The computed data were compared with the experimental data. In addition, Molecular Electrostatic Potential (MEP) and Frontier Molecular Orbital (HOMO–LUMO) analysis of the BIT has been investigated using same theoretical calculations. As biologic evaluation of BIT compound, in vitro its antibacterial and antifungal activities and antioxidant activities have been investigated.

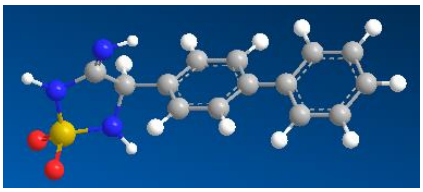

Figure 1. Structure of BIT

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A RESEARCH ON GEOTHERMAL ENERGY POTENTIAL IN KIRKLARELİ CITY

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Geothermal energy is one of the important renewable energy sources which provides massive contribution to the region by direct usage and/or indirectly usage which is electric production. It is very critical resource for our country and the region by providing the return on investment in a relatively short time and relatively less environmental damage. Indirect usage meaning electric production requires at least 100^0C saturated steam but for direct usage applications such as household heating, green housing relatively low-enthalpy resource which are around 50^0C is enough to use this energy with the help of current technology. Direct usage applications can be critical for the local communities' basic needs such as heating, nourishment etc. This topic is supported by the examples of applications in Turkey. In this study, newly discovered "low-enthalpy" resource at Thrace Region will be investigated for potential applications according the geothermal drilling researches done by Mineral Research and Exploration (MTA) [1] at Kırklareli Asimbeyli location which have potential of 2,38 Megawatt (MW) energy income and possibility to utilize green housing area of 12.500m^2 and heating of 340 household's plus potential of thermal tourism for the 2,600 individual [1] .

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THE PROPERTIES OF INTERSUBBAND OPTICAL ABSORPTION COEFFICIENTS UNDER INTENSE LASER FIELD FOR DIFFERENT LOCALES OF A SQUARE GaAs/AL (GaAs) QUANTUM WELL WIRES

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We study laser field effects on the electronic and optical properties of GaAs/Al (GaAs) quantum wires with the equilateral square and deltoid cross sections. The deltoid cross-section quantum wire is obtained with 45^o axial rotations of the square cross-section quantum wire in the x-y plane. The finite differences method within the effective mass approximation was adopted in the calculations. The energy eigenstates and the electronic wave functions of the wires have been obtained. The total absorption coefficients and the reflection index changes have also been found with and without laser field. The differences of the electronic and optical parameters sourced from the cross-sectional shape were determined and explained. The blue shift and red shift effects on the total absorption coefficients and the reflection index changes were identified depending on the laser field strength. The results have the potential of being useful in device applications.

Keywords: Quantum well wire, intense laser field, absorption coefficient, refractive index changes

STUDIES ON THE OPTICAL, STRUCTURAL AND ELECTRICAL PROPERTIES OF CADMIUM DOPED ZINC FERRITE AND MAGNESIUM FERRITE

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A photoelectrochemical (PEC) system is a potentially effective method of producing hydrogen from sunlight and water. While a great deal of progress has been made in our understanding of PEC systems, practical, inexpensive, efficient, and stable devices have not yet been realized. The search for efficient photocatalysts for water splitting under visible light irradiation has been approached from several directions: to find new single phase materials, to tailor the band gap by modifying cations or anions of UV or visible photocatalysts with substitutional doping and to improve PEC properties of photocatalysts by loading or doping with a metal or noble metal. Many studies have sought to improve the PEC properties of iron oxide by doping with various metals. Most dopants have been shown to increase carrier concentrations, but some have decreased the photocurrent by introducing electronor hole traps. Extensive research has been conducted on the introduction of certain defects or dopants into iron oxide which could enhance PEC performance.

Cadmium doped zinc ferrite and magnesium ferrite films were synthesized on glass substrates by Chemical Spray Pyrolysis (CSP) method.
The technique of CSP without the requirement of vacuum is a method that can be preferred in the industry, in order to allow the production of large size films in both cheap. However, there are some disadvantages of films made with this technique, such as their thickness being not uniform and the size of the film-forming atoms being limited and the film in chemical solution to be grown must be homogeneous. Many parameters such as substrate, substrate temperature, the salts, solvent type, and molarity and deposition time have carefully been chosen to obtain the best growth condition in this technique.

The effects of doped cadmium metal on the thin films were analyzed through Scanning Electron Microscopy (SEM), Atomic Force Microscopy (AFM), X-ray Diffraction (XRD) and UV-Vis double beam spectrophotometer and for electrical properties of films were ussed Van der Pauw technique. The change in the surface morphology of the thin films has been observed with the SEM and AFM measurements.

Keywords: Photoelectrochemical; Zinc ferrite; Magnesium ferrite

GALLIUM DOPED SPINEL ZINC FERRITE AND MAGNESIUM FERRITE THIN FILMS GROWN BY SPRAY PYROLYSIS

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Magnetic nano spinel ferrites have grabbed attention due to their fascinating size dependent optical, electronic, magnetic, thermal, mechanical and chemical properties. The properties of such nano-structured materials are deeply influenced by their chemical composition and microstructure, which are sensitive to the manufacturing process. Spinel ferrites have the general formula AFe_2O_4 (where A^{2+} = Co, Ni, Zn, Mg, etc.) and the unit cell contains 32 oxygen atoms in cubic close packing with 8 tetrahedral (T_d) and 16 octahedral (O_h) occupied sites. By changing the type of divalent cation, it is possible to obtain a wide range of different physical and magnetic properties.

Gallium doped spinel zinc ferrite and magnesium ferrite thin films were synthesized on glass substrates by Spray Pyrolysis (SP) method.

The effects of doped gallium metal on the thin films were analyzed through Scanning Electron Microscopy (SEM), Atomic Force Microscopy (AFM), X-ray Diffraction (XRD) and UV-Vis double beam spectrophotometer and for electrical properties of films were ussed Van der Pauw technique. The change in the surface morphology of the thin films has been observed with the SEM and AFM measurements.

Keywords*:* Gallium; Zinc ferrite; Spray Pyrolysis

PREPARATION OF POLISHING SLURRIES CONTAINING AL_2O_3 FOR CHEMICAL-MECHANICAL POLISHING IN METAL-KITCHEN EQUIPMENTS

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Lapping or polishing is one of the developing technologies in human history. Recently, functional enhancement requests have been recognized as a critical technology for functional materials for ultralapping or polishing, precision machine parts, optical components and electronic components. Polishing is to try to achieve a smooth mirror surface by slowly removing these materials by plastic deformation while performing fine sandpaper particles without allowing brittle fractures on the working surfaces[1]. For this type of polishing, fine embossments of less than 1 mm and pitch, wax, synthetic resin or artificial leather cushions are used to achieve smooth mirror coating. The fine abrasive particles are kept flexible and plastic on the pad surface and the work surfaces are drawn microscopically. Compared to the abrasive, the polishing process is much smaller and is a successful addition to the brittle materials. Polishing is generally applied for the following purposes:

*To provide a beautiful appearance
*Effect of external conditions
*Prepare the pieces for other operations (copper plating, nickel plating, chrome plating, galvano plast)

In this study, different types of aluminum oxide (Al_2O_3) slurries will be produced and effects on stainless steel products will be examined. The following effects will also be investigated in this study; the particle size of the oxide species, the dispersion, the α-alumina ratio, the specific surface area (BET) and the impurities in Al_2O_3 in the aluminum oxides.

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CdTe THIN FILMS FOR INFRARED DETECTOR APPLICATIONS

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Mercury Cadmium Telluride (HgCdTe) is widely used material in infrared detectors for electric, electronic and photonic properties [1]. HgCdTe films were mostly grown on GaAs substrates due to its commercially availability as epi-ready wafers [2]. However, the large lattice mismatches between HgCdTe thin films and GaAs substrates and Ga diffusion into HgCdTe layers limit the detector performance. Therefore, growth of a buffer layer consist of CdTe material is proposed to reduce detrimental effect of lattice mismatches and prevent Ga diffusion [3].

In the present work, CdTe (211)B epitaxial thin films were grown on (211)B oriented GaAs substrates by Molecular Beam Epitaxy (MBE) for use as buffer layer for HgCdTe thin films used in infrared detectors [4]. Produced CdTe thin films were surface characterized by atomic force microscopy and scanning electron microscopy. Surface roughness of thin films was determined and the thickness of the films was compared via cross-sectional scanning electron microscope, Fourier transform infrared spectroscopy and spectroscopic ellipsometry. Atomic compositions of the thin films were obtained by energy dispersive X-ray apparatus of scanning electron microscope. Temperature dependent Raman spectroscopy investigations were performed to understand the behavior of Raman active modes of thin films. Lastly, Everson method were applied to the thin films to reveal lattice mismatch-induced dislocations. Decorations obtained after the Everson etching confirmed the (211) B type structure of CdTe thin films deposited on GaAs (211) B surface and dislocation densities were determined.

Keywords: Mercury Cadmium Telluride, Infrared Detectors, Molecular Beam Epitaxy, Buffer Layer, Eching, Temperature Dependent Raman Spectroscopy

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NEW CONDUCTING POLYMER BLENDS FROM AMINO-SUBSTITUTED NAPHTHALENE SULFONIC ACID FOR ANTISTATIC APPLICATIONS

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In here, some physical properties of blends of low-density polyethylene (LDPE) with poly (7-amino-4-hydroxy naphthalene-2-sulfonic acid), (J-acid) were presented [1]. The polymer blends were prepared by loading J-acid (0.5, 1.0 and 3 wt %) into LDPE matrix in the twin-screw micro extruder. FTIR, AFM, SEM microscopy and XRD techniques were used to structurally characterize the prepared blends. The influence of J-acid on LDPE blends were described by using thermal analysis techniques (DSC, TG, DMA). The physico-mechanical properties such as elongation at break were also investigated as a function of J-acid content by stress-strain curves. On the other hand, the conductivity of conducting polymer blends was found to be around 10^{-11}- 10^{-12} S/cm, showing these materials have a potential for various applications including in antistatic packing, electromagnetic shielding, and anti-corrosion shielding.

Keyword: Electrostatic charge dissipation, static decay time, poly(aminonaphthol sulfonic acid).

[1] F.Doğan, U*se* as *antistatic* agent of electro-active fluorescent polymers in polyolefin based materials, TUBİTAK-KBAK, Project number: 113Z587, 2016

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THE INFLUENCE OF DISPERSIVE AGENT ON SOLID STATE THERMAL DECOMPOSITION OF LDPE/J-ACID BINARY BLENDS

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Low density polyethylene (PP-LDPE) blends involving different amounts (0,5, 1, 3 wt %) of poly(7-amino-4-hydroxy naphthalene-2-sulfonic acid, (J-acid) were prepared by melt-blending with a single-screw extruder [1]. The effect of additive J-acid on solid state thermal decomposition kinetic of newly prepared binary blends was then investigated. The degradation kinetics of binary blends was investigated by thermogravimetric analysis in dynamic nitrogen atmosphere at a single heating rate. Thermograms of binary blends showed the thermal decomposition occurred in one weight-loss stage. In studying of the decomposition kinetic, some parameters such as activation energy, reaction order and pre-exponential factor for thermal decomposition of binary blends was found by van Krevelen (vK), Horowitz–Metzger (HM), Coats–Redfern (CR), Madhusudanan–Krishnan–Ninan (MKN) and MacCallum–Tanner (MC) methods. The results showed that the thermal stabilities and activation energies of blended prepared were changed as the J-acid ratio in the blends increased.

Keyword: Binary blends, Activation energy, Thermal decomposition

[1] F.Doğan, U*se* as *antistatic* agent of electro-active fluorescent polymers in polyolefin based materials, TUBİTAK-KBAK, Project number: 113Z587, 2016

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PRACTICAL CLINICAL VETERINARY APPLICATION PROGRAM

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Regardless of the type of work, digital information is now making itself known in the world. There are many technological advances in line with the rapidly increasing needs of people. Many programs in parallel with what is said in veterinary medicine have been included in life. In particular, there are dozens of other android programs running on different levels abroad (DoggyDoc, 5 MCC, Mobile DDx in Small Animal Veterinary Medicine, Veterinary Diseases Symptom And Treatment, Hundekrankheiten, Doumi Vetapp, Easyvet, Vetemecum etc). In Turkey also placed on the market there are numerous digital applications. But two of them are quite comprehensive and remarkable (Vet. Asistani and Datavet). Both programs are used up-to-date. But the Vet. Asistani we are trying to develop is different from Datavet thanks to a few features. The beta version, which is currently available free of charge on PlayStor, works with devices outside the IOS operating system (Windows, IOS operating systems) or Android mobile phones. The real purpose of the Vet. Asistani; It is to easily diagnose diseases by adding laboratory findings when necessary, based on clinical examinations and symptoms of diseases of cats, dogs, horses, poultry, bees, pigs, fish and ruminants (sheep, goat, cattle). Detailed information about the etiology, symptoms, differential diagnosis, treatment and protection of the loaded pet diseases is available. Drugs to be used by the veterinarian for treatment or protection are provided from general and special library sections and include extensive information. In the diseases section: 16 kinds of bee diseases were loaded with 95 fish, 100 pigs, 40 poultry, 174 cat-dogs, 203 sheep-goats, 220 horses and 290 cattle diseases respectively. There are 1462 specialties, 533 active ingredients and 610 prospectus information in the pharmaceutical guidelines section. The file size is approximately 95 MB.

The symptom that is completely displayed on the screen by the user is evaluated by the program and the type of the disorder is easily diagnosed. Symptoms that are completely displayed on the screen by the user are evaluated by the program. The type of the disease is easily identified.

As a result, Vet. Asistani is improved in Turkey, and veterinary faculty students, young veterinarians working for experience, and for clinicians working professionally in this area is a helpful program for teaching and learning purposes.

THE EFFICIENT ROLE OF RAPID DIAGNOSTIC BIOCHEMICAL TEST KITS ON TREATMENTS IN NEONATAL ENTERITIS

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The biggest problem threatening the lives of neonatals is dehydration and acidosis. For this reason, rapid diagnosis, fast liquid and drug treatments are used to remove the living from death. Another benefit of this is that it prevents the use of unnecessary drugs, especially antibiotics. In this study, we aimed to find causes of diarrhea in 28 patients with diarrhea in 0-90 days age range from 54 calves brought to our clinic. In addition to hematological and biochemical measuring devices, especially in case of enteritis cases under field conditions, only the type of that does not require a device was determined by using the Rapid Diagnostic Test Kits. Thus, the five most common factors in herbivorous neonatal diarrhea (E. Coli F5(K99), Rotavirus, Coronavirus, Clostridium Perfringens and Cryptosporidium were investigated. In addition, stool samples taken from the rectal route were examined microscopically for other parasites. The pH and glucose values of the stool were checked with biochemical urine test strips. Blood samples were taken intravenously from animals. WBC, RBC,% PCV, Hb levels were measured by Auto Hemogram. After determining the cause of diarrhea, treatment was started quickly. The numbers and the mortality rates of the calves classified according to their daily ages were determined as (7/3) 42.9% (0-7 days), (7/2) 28.6% (8-15 days) and (11/5) 45.5% (16-30 days), respectively. No death occurred in the 31-90 days.

As a result; Since the determination of in calves under field conditions and effective treatment is always a challenging issue in the clinic, determining whether the agent is bacterial, viral, parasitic or mixed is necessary for effective fight against disease. Due to a limited number of test techniques that veterinarians can perform in field conditions, we did not try to determine viral, bacterial and parasitological factors by using detailed techniques in the laboratory. Only quick diagnostic test kits were used in the stool. The aim was to ensure effective detection of patients with correct and informed interventions. Thus, the mistakes made without being aware were reduced and calf deaths were minimized. Both material and spiritual losses have been avoided. It has been concluded that the techniques we apply in diarrhea cases will be an example to veterinarians who provide clinical services and can be easily applied by them.

BALANCING THE LIMB MASSES OF THE MECHANISMS

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In this study, the problem of the equilibrium of the inertial forces acting on the moving limbs of the mechanism due to the motion of the mechanisms and the balance of the limb masses on the basis of the mechanism is investigated in order to reduce the imbalance of the moments in the mechanism. The solution of this problem is addressed by balancing the general inertial force vector and the general moment of inertia created by the limb masses. With the assumption that the lengths of the limbs are known in order to achieve the balancing conditions, the necessity of determining the limb masses in the form of the position of the resultant center of gravity of all moving limbs in the mechanism and the centrifugal moment of inertia of all moving limbs remains fixed.

Keywords: Mechanisms, Balancing, Limb masses

THE EFFECT OF BINDER RATIO ON MECHANICAL PROPERTIES OF KHORASAN MORTAR

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In this study, the effect of binder ratio on compressive and flexural strengths of Khorasan mortars was investigated. Crushed brick with the size of 0-4 mm was used as aggregate in mortar design. Hydrated lime dust was used as binder in mortar mixtures, in proportions of 20, 30, 40, 50 and 60 percents, respectively. 40 mm×40 mm×160 mm sized mortar specimens were produced. Weight per unit volume, compressive strength and flexural strength of mortar specimens at the age of 9 years were determined. As a result, it was found that the increased amounts of lime in mortar mixtures linearly increased the specific weight of mortar, flexural strength and compressive strength values.

Keywords: Khorasan mortar, Lime, Crushed Brick, Flexural Strength, Compressive Strength.

THE EFFECT OF CURING CONDITIONS ON MECHANICAL PROPERTIES OF ALKALI-ACTIVATED MORTARS

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Alkali-activated materials are more environmentally-friendly and sustainable materials in comparison with conventional concrete. In concrete production, cement is used as main binder and cement production is a pollutant process due to high carbon dioxide emissions during clinker production. By taking into consideration the high levels of energy consumption in this process, the need of using alternative construction materials arise. Alkali-activated materials, in which pozzolans such as fly ash and blast furnace slag gain binding property in the presence of alkaline activators, can be alternative construction materials especially in prefabricated structural members. The use of industrial by-products in alkali-activated materials makes these materials more energy-efficient and eco-friendly.

The aim of this study was to determine the effect of curing conditions on flexural and compressive strengths of alkali-activated slag based mortars. Sodium hydroxide (NaOH) solution and liquid sodium silicate (Na_2SiO_3) were used as activator solutions in alkali-activated mortars. In mortar design, blast furnace slag, alkaline activator and standard sand were used and mortar specimens were exposed to three different curing conditions: moist curing entire-time, in laboratory air entire-time, and in laboratory air after 24 hours in 60˚C. Portland cement CEM I 42.5 R, water and standard sand were used in reference sample. For each curing condition, flexural and compressive strengths of mortars were tested at different ages.

THEORETICAL INVESTIGATION OF NONLINEAR OPTICAL PROPERTIES OF SOME BIS-THIAZOLE DERIVATIVES

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Materials exhibiting NLO behaviour are used in a wide range of applications from telecommunication, optoelectronic data processing and storage to organic light emitting diode (OLED) applications in many optoelectronic system designs in parallel with today's evolving technology [1-3]. Organic compounds carry a greater potential for NLO material than inorganic materials based on they have a high polarizability property when interacting with light. These compounds having a large π-conjugation system and also containing strong donor-acceptor groups linked to a broad to an aromatic ring system that increases charge transfer through π-electron delocalization have very high NLO material property [4,5].

In this study, the NLO behaviours of some bis-thiazole derivative compounds have been examined by theoretical methods. Total electric dipole moment, μ_{tot}, mean polarizability, <α>, total first-order hyperpolarizability, β_{tot}, values have been computed by using DFT/B3LYP method at 6-311G(d,p) basis set. In addition, the frontier molecular orbital energies; the highest occupied molecular orbitals (HOMO), the lowest unoccupied molecular orbitals (LUMO) and the HOMO-LUMO band gaps of the compounds have been investigated at the same theoretical level to understand NLO behaviour with molecular orbital structure.

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THE INFLUENCE OF ACTIVATOR CONCENTRATION ON STRENGTH CHARACTERISTICS OF ALKALI-ACTIVATED SLAG MORTARS

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Alkali-activated mortars and concretes are alternative construction materials to Portland cement with their advantageous properties such as having lower cost of production, lower need of energy in production and being more environmentally friendly. Conventional concrete production is a large-scale industry with some negative effects: high levels of carbon dioxide emission and the growth of energy consumption during production. Industrial by-products can be used as main binder in alkali-activated materials. By the substitution of by-products like blast furnace slag and fly ash for traditional cementitious materials, the emissions of greenhouse gases during cement production can be decreased and their environmentally hazardous effects can be eliminated. However, to produce a sustainable construction material, workability, durability and strength characteristics of alkali-activated materials should be investigated thoroughly as well as their cost of production, and the need of the development of standards for these materials become apparent.

The purpose of this study was to investigate the effect of varying molarity of alkaline activator on mechanical properties of alkali-activated slag mortars. In this experimental study, alkali-activated slag mortars were produced, and blast furnace slag was activated by alkaline activators, which were sodium hydroxide (NaOH) solution and liquid sodium silicate (Na_2SiO_3). The mortar design kept same while the molarity of sodium hydroxide solution changed. The composition of alkali-activated mortars was consisted of standard sand, alkaline activator and blast furnace slag where no cement was used. CEM I 42.5 R Portland cement was used in reference mortar sample, and all the specimens were moist cured. Flexural and compressive strength values of 40 mm×40 mm×160 mm sized mortar specimens were determined at different ages.

RESIDUE LEVELS RELEASED IN DIFFERENT PARTS OF SUNFLOWER OF IMAZAMOX HERBICIDE IN FLOWER POT CONDITIONS

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The research was carried out in three replications, two soils, three imazamox doses and three irrigation water levels in flower pots (195 lt) conditions in Trakya Region/Kırklareli Province. In the study, residue levels left of imazamox in 20 honey samples produced under the influence of sunflower flour on different plant parts were investigated. According to the results obtained from the experiment; imazamox was detected between in the leaf at 0.7-104.2 µg L^{-1}, at the body at 1.6-89.9 µg L^{-1}, and on the table 0.5 and 82.7 µg L^{-1}. The imazamox residues amounts determined in different parts of the plant were found in the table>leaf>stem. In the residue amounts, a significant reduction in the amount of herbicide from the first application stage to the final stage was observed. Doses of imazamox in different amounts applied were effective on the residues such as irrigation rates and soil structure (pH, clay ratio, amount of organic matter, CEC). Imazamox residue was not found in honey samples.

Keywords*:* Sunflower, imazamox, honey, residue.

MOLECULAR METHODS USED IN MICROORGANISM DEFINITION

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Molecular identification methods are one of the most important innovations in the field of microbiology of developing technology. The addition of a new molecule to molecular identification techniques day by day is of great benefit to scientific studies carried out for different purposes [1]. Molecular methods in the field of food; It can be used in the detection of target microorganism in food, in the determination of microorganism numbers, sensitivity and shortness of isolation and identification of microorganisms, characterization of suspicious isolate in food microbiology due to pathogenicity [2].

The available conventional methods used for detection of microbes in foods are time consuming and unable to analyze new organisms, thus many food analyses need rapid detection approaches. Rapid detection approaches can be classified into nucleic-acid sequence based techniques (like polymerase chain reaction (PCR), multiplex-PCR, real-time PCR, loop mediated isothermal amplification, nucleic-acid sequence based amplification and DNA microarrays), biosensor based technology (like optical biosensors, electrochemical biosensors, mass based biosensors and biochemical sensors) and immunological based methods (like lateral flow immunoassay and ELISA (enzyme-linked immunosorbent assay)) [3].

The most common uses of nucleic acid-based techniques are; colony (DNA) hybridization technique, PCR (polymerase chain reaction) technique, ribotyping technique and 16S rRNA techniques. The most important advantages of nucleic acid-based methods, when compared to conventional methods, the accuracy is high because it is possible to get results in a short time, the need for living cells is not needed (especially in order to show the source of contamination in hygiene controls), the damaged cells can be detected and they are very specific techniques [4].

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THE EFFECT OF DIFFERENT MINERAL WATER USED AS CURE AND MIX WATER ON THE BENDING AND COMPRESSIVE STRENGTH OF CEMENT MORTAR

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As it is known, concrete mix and contact water shall not show acid reaction, it shall be equal to and above PH 7.

In this study, the effect of using mineral waters of different structures in Kırklareli Province and surrounding area as mix water and cure water on the bending compressive strength of cement mortar was researched. Kırklareli municipal drinking water, Kırklareli spring water, Kırklareli Şeytan Deresi water, natural mineral water and prepared water were used. A total of 20 specimens were prepared for each mixture from 40 × 40 × 160 mm mortar samples replaced mix waters for 7 and 28 days: half of the samples were stored in cistern water and the other half were kept in their mix water. The pH values of the mix and contact waters used in the samples were measured and the weight per unit of volume and bending-compressive experiments were performed on samples 7 and 28 days.

In this experimental study, it is aimed to increase the compressive strength of mortars by using mineral waters as cure water and mix water to the concrete.

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EVALUATION OF MECHANICAL CHARACTERISTICS OF THE INTERLOCKING CONCRETE PAVES PRODUCED FLY ASH

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Fly ashes are used as pozzolanic admixtures or filler materials in concrete production. Increasing the use of fly ash is important both in terms of economy and environmental pollution. The interlocking concrete paves are commonly used in urban streets and pavements, in factory surroundings and etc. Interlocking concrete paves shall be above the minimum strength specified in TS 2824 EN 1338 standard.

In this study, fly ash has been used as a substitute to cement in 0, 10, 20, 30, 40 and 50% ratios. The splitting tensile strength and water absorption characteristics of the pave have been determined. The usage of the FA in the production concrete pave is a more high quality production, more economical and a more environmentally friendly approach.

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EFFECTS OF DIFFERENT AGGRESSIVE CONDITIONS ON CEMENT MORTARS CONTAINING RICE HUSK ASH

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The rice husk is an organic waste and is the result of the removal of the grains of the paddy grains during the grinding process of paddy. The rice husk ash is obtained by incinerating the rice husk.

In this study, 40x40x160 mm prisms were produced for the bending and compressive strengths by replacing the cement 10%, 20% and 30% of the weight of the rice husk ash. Produced mortar samples were stored at 20 ± 3 ºC temperature for 7, 28 and 90 days under three different conditions as drinking, waste and sea water. Concretes produced by rice husk ash replacement are less permeable and more resistant to aggressive waters. An economy will also be achieved at the same time by replacing the rice husk ash with cement.

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CHATTER VIBRATION AND STABILITY ANALYSIS FOR ORTHOGONAL CUTTING IN TURNING

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In machining, tool vibrations are one of the most important factors affecting production efficiency negatively. One of the most important factor limiting the cutting operation in high-speed turning is chatter vibrations. There is a relationship between the required cutting power and shear forces for chip removal. The shear forces can either be calculated theoretically or measured with a dynamometer. Excessive pressure and friction during operation cause forces on the cutting edge in various directions. Variable chip thickness generated during cutting more triggers system instability. If the amplitude of the vibration does not decrease when compared to the amplitude generated in the previous pass, or if the amplitude of the vibration is constantly growing, this vibration is called chatter vibration. Chatter vibrations may generate high dynamic loads and these loads can cause damage on spindle, workpiece and machine. Researchers continue to work on predictable solutions for years but cutting system has to be modeled in great detail to predict in advance. In this study, chatter vibration prediction in turning was adapted for orthogonal cutting. Single degree of freedom (SDOF) model was performed and chatter frequencies obtained from forms of modal analysis and cutting tests.

INVESTIGATION OF THE MOLECULAR ORDERING AND CHARGE TRANSPORT OF CIRCULAR-OLIGOMER/FULLERENE COMPLEXES FOR SOLAR-CELL APPLICATIONS

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Considering the electronic structures of OPV devices, OPV efficiencies can be increased by maximizing the charge transport and charge separation processes at the donor-acceptor (D/A) interfaces. However, such processes critically dependent on material morphology. Consequently, increasing the efficiency of OPV materials for practical applications requires high level morphology engineering.

In this study, we use circular-oligomer/ fullerene complexes - circular oligomers encapsulating fullerenes - as an alternative to the bulk heterojunction morphology. We investigate bulk properties such as paracrystal order, electronic disorder, energetic disorder, hole/electron mobility, charge separation and charge recombination at D/A interfaces via quantum mechanical, stochastic and molecular dynamics methods to quantify the overall efficiency of such materials.

Understanding such systems would be the basis of understanding the transport properties of similar, but, much sophisticated D/A interfaces. Therefore, we anticipate that these systems will be an intriguing candidate and influence future considerations in solar cell applications.

SYNTHESIS AND CHARACTERIZATION OF POLY (ETHER)S CONTAINING RESORCINOL UNIT

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The oxidative polymerization of phenoxy naphthalene derivatives constitutes a class of interesting research topic [1]. Polyphenols or phenoxy naphthalene have been received much more attention because of their thermal and mechanical properties [2]. Polyphenols or poly (phenoxy imine)s are used to prepare composites, graphite materials, epoxy polymers and materials resistable to high temperature. They were more favorable than the metal-based conducting materials. A great advantage of semi-conducting polymers is that their physical and chemical properties could be tailored to specific application need. The technological application of conjugated polymers includes solar cells, sensors, electro-chromic materials, electromagnetic shielding, and light emitting diodes [3].

Thermogravimetric analysis (TGA) has been widely used to investigate the thermal stability characteristic of various substances, including polymer pyrolysis [3]. Poly(ether) compounds were synthesized from HBr elimination of 1,5-dibromine pentane, 1,2-bis(2-chlorineethoxy)ethane, 3,5-bis(brominemethyl)toluene with 4,6-Dichlororesorcinol. [1]. The structures of synthesized compounds were confirmed by FT-IR, UV-Vis and CV measurements. In addition, thermal properties were determined by TGA-DTG, DTA measurements.

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UNCONSCIOUS ANTIBIOTIC USE AND BACTERIAL ANTIBIOTIC RESISTANCE PROBLEM

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Antibiotics widely used in the field of human and veterinary medicine can reach the receiving environment in different ways. It is known that antibiotic residues are toxic at high concentrations. Antibiotics in low concentrations cause bacteria to develop resistance to antibiotics. As a result, bacterial strains resistant to antibiotics are developing, which poses a significant risk to human health and the ecosystem [1].

Mortality due to infections in which a resistant bacterium is the cause is twice as much as infections in which a susceptible bacterium is the causative agent. In addition, antibiotic resistance leads to the use of more toxic, broader spectrum or more expensive antibiotics in patients [2]. The use of bacteria in animal husbandry as well as human use should also be considered in the development of antibiotic resistance. Because of this, the identification of low amounts of antibiotics in animal-derived foods is very important. Knowing the antibiotic resistance mechanisms in bacteria and the antibiotics that best determine these resistance mechanisms make it easier to determine antibiotic resistance [3].

Attention should be paid to the identification of the correct natural bacteria and to the extent that they are as low as possible in order to detect known natural resistance or susceptibility in bacteria. Determination of antimicrobial resistance / susceptibility of bacteria was carried out by Bauer et al. (1966) has been widely used for antibiotic disc diffusion. Especially in dairy enterprises, while milk is being collected as raw material, enterprises try to determine the presence of antibiotics qualitatively by using antibiotic detection kits. The amount of antibiotic residues can be quantitatively determined by reliable methods such as LS-MS / MS, especially in meat and milk. Attention should be paid to the identification of the correct natural bacteria and to the extent that they are as low as possible in order to detect known natural resistance or susceptibility in bacteria. This is possible with molecular methods.

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COMPLEXES AS DSSC PHOTOSENSITIZERS

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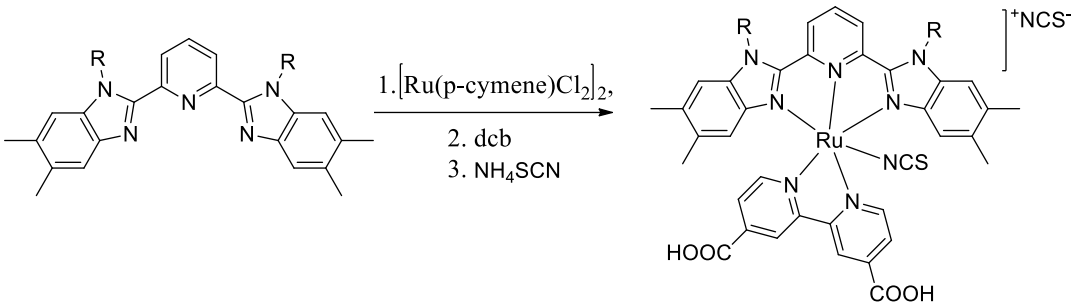
In dye sensitized solar cell technology, where sun beams are absorbed by the photosensitizer and converted to electrical charges, the photosensitizer dye is the most important parameter between spectral response, curreny density, semiconductor layer thickness, stability, etc. [1]. Ru (II) polypyridine complexes are the most commonly synthesized metal complexes as photosensitizers in DSSCs due to their rich photophysical properties, broad absorption range, long excited-state, high emission quantum yields [2]. In this study, 2,6-bis(benzimidazol-2-yl)pyridine derivative ligands and their Ru(II) complexes were synthesized by using 2,2'-bipyridine-4,4'-dicarboxylic acid and thiocyanate groups as auxiliary ligands. The synthesized ligands and complexes were characterized by FT-IR, UV-Vis, NMR and LC-MS spectroscopic techniques. E_{HOMO}-E_{LUMO} energy levels and band gaps of the prepared Ru(II) complexes were determined by using cyclic voltammograms and fluorescence spectras. The photovoltaic properties of the complexes were investigated to examine the usabilities in DSSCs.



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FORMULATION OF LINEAR CONSTITUTIVE EQUATIONS OF THERMO-VISCOELASTIC MEDIUM

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In this study, the mathematical formulation of linear linear constitutive equations of a heat-conducting viscoelastic medium is discussed. Viscoelastic materials are known to be elastic and exhibit a flow behavior depending on time. Viscoelastic materials are also called time dependent materials because the time plays a very important role in determining the behavior of the medium. Two important constitutive models for viscoelastic materials are known as Kelvin-Voigt Body and Maxwell Body. In this study, a Kelvin-Voigt body has been chosen as the viscoelastic medium model. In order to account for heat transfer, a material temperature gradient vector, which is defined as identified as $\mathbf{G} \equiv \theta_{,K}\,\mathbf{I}_K$, is included between independent constitutive variables. In order to obtain the linear constitutive equations, a viscoelastic medium is considered at the $T_0 > 0$ temperature and in the natural state without stress. It is assumed that the strain tensor and the rates of deformation tensor, which they have occured when the viscoelastic medium changes shape, satisfy the $\|\mathbf{E}\| << 1$ and $\|\dot{\mathbf{E}}\| << 1$ conditions and the temperature changes are very small. The small temperature change refers to $\theta = T_0 + T$, $T_0 > 0$, $|T| << T_0$. As a result, the mathematical formulation of Cauchy stress tensör (as elastic part $\mathbf{t}_E$ and discrete part $\mathbf{t}_D$), heat flow vector, internal energy and entropy, which are constitutive equations of a thermo-viscoelastic medium, has been obtained.

FABRICATION AND CHARACTERIZATION OF FIRE-RESISTANCE GEOPOLYMER MATERIAL

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Portland cement is one of the topmost engineering building materials in use today. It has been used as a binding agent for concrete due to its exceptional thermal performance, mechanical properties and durability. However, there is an argument in environmental issues on the enormous energy consumption and emissions of carbon dioxide (CO_2) during its manufacture. The manufacturing of concrete in industry is one of the major contributors of the global warming. For this reason, geopolymers attract attention with applications such as environment friendly fireproof building materials, sound heat insulators, encapsulation of hazardous wastes [1]. Geopolymers have many advantages over Portland cement such as low energy cost, reduced greenhouse gas emissions, high compressive strength, high temperature stability, low thermal conductivity, high strength at early age. Protection against fire using inorganic polymer is a new application of engineering technology [1,2]. Geopolymer composites materials are promising from this point of view due to their advantages. Alkali activated geopolymers made from waste materials such as fly ash or blast furnace slag are particularly advantageous because of their environmental sustainability and low cost. However, their durability and functionality continue to be the subject of further work. Geopolymer materials can be used in various applications such as fire and heat resistant composites, depending on the chemical composition of the source materials and the activators. In this study, different prescriptions will be applied to produce fire resistance geopolymers and characterization studies will be carried out. Composite strucutre of metakaolin based geopolymer with basalt fiber is obtained. The basalt fiber-metakaolin Reinforced Polymer (BMFRP) structures arranged with silica content from 0 to 10% wt. The thermal properties, micro structures, energy efficiencies, sound insulation properties of the produced samples was tested. Samples will be invastigated with various characterization techniques such as Scanning Electron Microscopy (SEM) for surface morphology and Thermogravimetric analysis (TGA) for thermal behavior. Thermal conductivity, strength retention after heat treatment, non combustibility was used as indicators for investigation of fire endurance of geopolymer materials.

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FABRICATION AND CHARACTERIZATION OF MAGNETIC NANOPARTICLE-POLYMER COMPOSITE MATERIALS

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Nanostructures having scientific, industrial and medical importance have an important research topic due to its wide range of application area of electric, magnetic, spintronic and biomedicine feature. Thus, many nano-particle structures have been fabricated to use technology, military, medicine and industry [1]. Nano-composites have an important role in nanoscience and nanotechnology. Nano-composites generally consist of inorganic particles (nano size fillers) with their reinforced polymer matrix. These structures are mostly dielectric materials having different shapes and sizes filled with metallic or magnetic particle. Polymer-nano metallic composites due to its thermal, mechanic, chemical, magnetic, electric, electronic and optic properties have a very high commercial potential and excellent materials in many application areas. However, composite materials have become widely used in electromagnetic absorber technology due to its higher advantages. Electromagnetic Radiation (EMR) absorber materials are extensively studied especially their stealth aircraft feature and other stealth-like military coating. Significant progress in this regard over the world [2]. However, this progression is unclear what the exact level is, due to keeping these project result secret. In addition, it has been known for publicly available sources that, these material consist of different nanostructure (nanoparticle or nanowire) materials. In this study, the MNP of $Cu_xTi_{(1-x)}Fe_2O_4$, $Cr_xTi_{(1-x)}Fe_2O_4$ ve $Co_xTi_{(1-x)}Fe_2O_4$ will be synthesized by the bottom-up technique. The Florocopolymer - MNP composite materials will be synthesis by 2 different way; Firstly, polymerization and MNP synthesis reactions are performed simultaneously in the same environment, so monomer and metal precursor salts are added to the reaction medium to initiate radical polymerization. Polymerization and reduction reactions are completed and the composite material is fabricated. Secondly, the copolymer and MNP prepared in different media are mixed in a suitable solvent environment to produce composite material

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PRODUCTION OF POLYMERIC FIBER REINFORCED GEOPOLYMER COMPOSITE MATERIAL

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In the composites industry, the process of polymer + fiber composite has evolved to be the preferred, and most cost effective method for producing pressure retaining structures from fiber reinforced polymeric (FRP) composites such as piping and tanks for the transportation/storage of fluids. Fiber Reinforced Polimer (FRP) commonly used in different fields is produced in the form of fabric and laminate and applicated by externally bonding to the surface of structural members. There must be excellent adherence between FRP and wrapped material interface to display composite and monolitik behaviour [1]. Geopolymers are noncrystal alumina silicate polymers that formed with the combination of reactive alumina silicate materials and silicate solutions in the normal temperature conditions. Geopolymer and reinforced composite materials is a polycondensation compound. The mechanism is constituted on the reaction of different SiO_2 - Al_2O_3 - Na_2O or K_2O and H_2O ratios. Metakaolin, fly ash, volcanic glass and perlite were used as reactive alumina silicate material. Geopolymer and reinforced composite materials are promising from this point of view due to their advantages. Alkali activated geopolymers made from waste materials such as fly ash or blast furnace slag are particularly advantageous because of their environmental sustainability and low cost. However, their durability and functionality continue to be the subject of further work. Geopolymer materials can be used in various applications such as fire and heat resistant composites, depending on the chemical composition of the source materials and the activators. In this work metakaolin based geopolymer mechanism is investigated. SiO_2/Al_2O_3: 4 moles, Na_2O /SiO_2: 0,35 moles, H_2O/Na_2O: 18 moles ratio was fixed. Thermal and mechanical characterization studies was carried out by TGA and compression and bending tests. The structure analyses of geopolymer and its starting materials were also investigated by XRD, XRF and FTIR. The fiber ratio was arranged from 0 to 10 % wt. The mechanical properties of fiber reinforced geopolymer (FRGp) materials were also investigated. The mechanical strength of the FRGp is found the larger than1,5 to 3 times for its non-fiber geopolymer

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ORGANIC SEMICONDUCTOR PHOTOSENSORS

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Coumarin doped with poly (3-hexylthiophene)/p-Si photodiodes were prepared by the drop-casting technique. The current–voltage characteristics of the prepared diodes with the structure of Al/P3HT: Coumarin/p-Si/Al diodes were investigated under dark and various illumination intensities using both I–V and C–V methods. Using both illuminated DC and transient I–V and C–V measurements, the photocurrents are shown to depend on light intensity with the P3HT: Coumarin ratio influencing photoresponsivity. The photocurrents increase with increasing illumination intensity. C–V measurements show that the capacitance of the diode depends on voltage, frequency and illumination, indicating the existence of a continuous distribution of interface states that can be described in terms of organic-organic polymer blend domains in additional to the well studied metal-semiconductor interface states. The best responses were found to be for the diode having 10% Coumarin weight. These results suggest that the Al-p-Si/P3HT: Coumarin/Al diode can be used as a photosensor.

FABRICATION OF SUPERHYDROPHOBIC SURFACE USING FLUORO-STYRENE COPOLYMERS BY SPRAYING METHOD

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The control of the surface wettability is crucial in many industrial applications and is expressed directly by the contact angle (θ) of a liquid droplet on these surfaces [1]**.** Superhydrophobic surfaces are defined as having water contact angles (WCA) greater than 150° with a low contact angle hysteresis (CAH) value (the difference between advancing *(θ_a)* and receding *(θ_r)* contact angles) [1,2]. CAH value of ideal, flat monolayer surface is equal to zero; however, every surfaces have a CAH value deu to the surface roughness, surface chemical heterogeneity or contamination. Superhydrophobic surfaces are used as antifouling surfaces under air or water in many practical applications. Two important principles is valid to synthesis these surfaces: Firstly, a solid surface having low surface free energy must be formed and secondly the roughness of these surfaces must be high to accommodate the air pockets within them [1, 2].

In the first part of this study, we synthesized fluoroacrylate-styrene (PS-F) copolymers that styrene content is 50 wt % in CO_2-expanded monomer phase [3]. The PS-F polymer was characterized by NMR, FTIR and GPC. In the second part, we prepared superhydrophobic surfaces by applying the spray coating methods using PS and PS-F polymer solution in toluene, and their silica blends. It is found that the superhydrophobic PS-F-silica composite surface contact angle was changed from 100 to 170^o depending on floracrylate content, silica content and spraying time.

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ENHANCED GAS SEPARATION AND STORAGE PROPERTIES OF FUNCTIONALIZED METAL ORGANIC FRAMEWORKS

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The decline of greenhouse gas emissions such as carbon dioxide is an important target around the world and porous adsorbents like metal–organic frameworks (MOFs) materials hold great promise compared to the existing conventional technologies. MOF materials composed of metal ions and organic bridging ligands as main building units have been explored extensively [1]. Unlike the other traditional porous materials such as, zeolites, activated carbon and silica, MOF materials possess many outstanding properties, for example greater surface area, well-defined porous environment and chemical functionalization. MOFs have potential properties in a variety of research areas such as gas storage and separation, catalysis, drug delivery and sensing ability. An excellent MOF should have high affinity for CO_2 with optimum adsorption kinetics, to achieve both good selectivity for separation to CO_2 from flue gas mixture and cost-effective regeneration of adsorbent material. The strength of framework–CO_2 interaction is a key factor associated with uptake and selectivity of CO_2 [2]. Open metal sites in highly porous MOFs provide strong metal–CO_2 interaction without bonding thus leading to reversible adsorption. MOF materials exhibit high crystallinity, which is helpful for understanding immensely the structure-property relationship by using single-crystal X-ray diffraction technique. For example, the unprecedented highly selective CO_2 sorption from a CO_2/N_2 mixture, which is difficult to separate, was achieved using the new functionalized MOFs [3]. Successful determination of the crystal structures of the dried and CO_2-adsorbed forms using powder X-ray diffraction demonstrated that the synergetic effect of the interaction between CO_2 and the unsaturated metal centers and CO_2-philic groups on the surface of the pores contributed to such high selectivity.

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A NEW MOF BASED NANOCOMPOSITE FOR SUPERCAPACITOR APPLICATION

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Electricity a clean energy resource can solve major problems of our civilization. The most challenging issue in electric energy field is difficulties in its storage [1]. Among various energy storage methods, supercapacitors have attracted attention due to their significant advantages over secondary batteries with power density and long cycle time for applications. However, supercapacitors usually exhibit lower energy densities than rechargeable batteries. Therefore, improving the energy density of supercapacitors without sacrificing their power density and cycle life remains a great challenge. The supercapacitors can be divide into two types: electrochemical double layer capacitors (EDLCs) and pseudocapacitors. Pseudocapacitance is owing to reversible Faradaic reactions involving charge transfer between the electrolyte and electrode material. On the other hand, EDLCs are due to electrostatic charge storage at electrolyte interfaces with the charge accumulating in form of charges at the near surface of the electrode interface [2]. Metal organic frameworks (MOFs), a new class of porous materials, are formed by connecting metal ions with organic linkers via coordination bonds, which have attracted attention due to their tunable structures, versatile functionalities and multiple applications [3].

Here we fabricated a new rGO/MIL-101/PANI nanocomposite for supercapacitor application. The synthesized nanocomposite has characterized by IR spectroscopy, PXRD, SEM and porosity measurements.

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COVALENT ENZYME IMMOBILIZATION ONTO HIGHLY POROUS UIO-66-NH_2

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Numerous efforts have been given to the prepare of immobilized enzymes for various applications such as the reusability of catalysts with the aim of reducing the production cost, as stable and reusable analytical devices for sensor applications and purification of proteins and enzymes [1, 2].

Metal organic frameworks (MOFs) are highly crystalline and porous materials that hold great promise in a variety of applications such as selective CO_2 capture, H_2 storage, glucose sensing and heterogeneous catalysis [3]. MOFs are consisting of metal ions and organic ligands linked through coordination bonds. Thanks to a wide variety of the geometry of metal ions and organic ligands, the structure and topology of MOFs can be designed for specific applications [3]. Moreover, metal organic frameworks (MOFs) have attracted a great interest as support materials for enzymes in the past few years [3]. MOF–enzyme composites can be categorized into four types: surface attachment, covalent linkage, pore entrapment, and co-precipitation. In the covalent linkage approach enzymes can be covalently anchored on the surface of MOFs, to get enhanced recycling stability for heterogeneous catalysis.

In this study a new bio composite was synthesized horsadish peroxidase (HRP) immobilized with UiO-66-NH2 on the nanoscale. To immobilize the HRP, the crude enzyme and UiO-66-NH2 were mixed together and co-precipitated. Crosslinking polymer, glutaraldehyde (GA), was used to crosslink the enzyme with amino groups on the MOF surface. The UiO-66-NH2–HRP composite was characterized by IR spectroscopy, X-ray diffraction and SEM methods.

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CRYSTAL STRUCTURE AND RED-PHOTOLUMINESCENCE BEHAVIOUR OF EU (III) BASED METAL-ORGANIK FRAMEWORK

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The crystalline porous materials, namely metal−organic frameworks (MOFs), have attracted widespread interest for their fascinating structures and potential applications in different fields such as gas adsorption, molecular recognition, separation, dye enrichment, catalysis, chemical sensing and so on [1,2]. Recently, MOFs have also found many other potential applications not dependent on pores. In particular, lanthanide metal–organic frameworks (Ln-MOFs) often show intriguing solid state luminescence properties owing to unique 4f electrons. Especially, enormous investigations have been made on the unique optical properties of Ln-MOFs due to their large Stokes' shifts, high color purity and long luminescence lifetimes, which mainly originate from the f–f transitions through an 'antenna effect' [3]. In addition, Ln(III) compounds exhibit distinguished luminescent properties, emitting in the visible region of the spectrum (400–800 nm) with very sharp emission, which shows that this compound has highly potential application value in light-emitting diodes (OLEDs).

In this work, a new 2D Eu(III) based metal organic framework, $\{[Eu(btb)(H_2O)_2].(DMF)\}_n$ (**1**) [btb= 1,3,5-Tris(4-carboxyphenyl)benzene] has been synthesized under solvothermal condition and characterized by single crystal X-ray diffraction, solid state photoluminescence, UV-Visible absorption spectra and PXRD.

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SYNTHESES, STRUCTURE, NEAR-INFRARED AND VISIBLE LUMINESCENCE OF ND (III)- COORDINATION POLYMER

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Nowadays, the design and construction of Lanthanide coordination polymers (LnCPs) have become a very attractive research field because these materials can be applied potentially in gas storage/separation, optical and catalysis fields. Meanwhile, they often exhibit unusual coordination modes and strongly optical properties arising from 4f electrons. Recently, our research group have focused to rationally design new lanthanide coordination polymers because of their intriguing variety of architectures, topologies and potential applications [1,2].

In this work, a new 3D Nd(III) coordination polymer, $\{[Nd(ssa)(H_2O)_2].(H_2O)\}_n$ (ssa= 5-sulfosalicylic acid (**1)** has been synthesized with hydrothermally and characterized by single crystal X-ray diffraction, UV-Vis absorption spectra, UV-Vis and NIR photoluminescence. The structural analyses show that the compound crystallizes in the monoclinic $P2_1/n$ space group. The asymmetrical unit of this compound contains one ssa ligand, one Nd (III) ion, two coordinated water molecules and one solvent water molecule. Moreover, the solid state photoluminescent properties indicate that the compound gives a very strong and typical emission peaks of Nd (III) ion in the UV-Vis and NIR region. As a result, this material can potentially be candidates for laser systems [3].

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STRUCTURE ANALYSIS AND SOLID STATE LUMINESENCE PROPERTIES OF THE NEW TB (III) COMPOUND WITH 1-D HEXAGONAL CHANNEL

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Recently, Organic light Emitting Diodes (OLEDs) have been widely investigated for many potential applications such as display techonologies and electronic devices. Unique luminescent properties, long lifetimes and large Stokes shifts make Lanthanide Metal organic Frameworks (Ln-MOFs) perfect materials for OLED technologies.

In this study, three-dimensional Tb (III) Metal-Organic Framework (MOF) was synthesized under solvothermal condition. The compound can be formulated as [Tb (III).1/2(btb). (H_2O)](H_2O) (**1**) (btb= 1,3,5-Tris(4-carboxyphenyl) benzene). Single crystal diffraction techniques were used find out crystal structures and features of the Tb (III) compound. Single crystal analysis reveal that compound **1** crystallizes in trigonal R32 space group with the unit cell parameter of a=b=28.6303(7), and c=12.0960(4) and α=β= 90° and γ=120°. The asymmetric unit consists of a Tb (III) ion, half btb^{2-} anion, one coordinated water molecule and one lattice water molecule. Each Tb (III) atom adopts a distorted monocapped square-antiprismatic geometry, which the eight-coordinated environment around Tb (III) centre is completed by eight oxygen atoms from phenyl group of the btb ligand and one oxygen atoms from coordinated water molecule. All bond lengths and angles are comparable to similar structures. Furthermore, Tb (III) ion emits intense green luminescence in the visible region. Thus, its complexes are likely to ensure new functional materials and OLEDs that possess fascinating properties and are attractive target points for exploring the luminescent materials.

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THE ANALYSIS OF THE ELECTRICAL PROPERTIES OF THE Cu/n-TYPE Si STRUCTURES AT ROOM TEMPERATURE

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We investigated the main electrical characteristics of Cu/n-type Si structures at room temperature (300 K). The electrical characteristics such as ideality factors (n), barrier heights (Φ_{bo}), series resistances (R_S), and reverse-saturation currents were investigated using the forward bias current–voltage (I–V) and capacitance–voltage (C–V) dates. The current–voltage (I–V) characteristics of the Sn/p-Si structures were analyzed by the thermionic emission theory. Also, the energy distribution of interface states density (N_{SS}) as a function of energy distribution (E_C-E_{SS}) were determined from the forward bias I–V characteristics by taking into account the bias dependence of the effective barrier height. The results show that the interface states densities obtained taking into account the series resistance are lower than those obtained without taking into account the series resistance.

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TEMPERATURE DEPENDENCE OF C–V AND G/ω–V CHARACTERISTICS OF Sn/p-TYPE Si SCHOTTKY STRUCTURES

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In this study, the forward and reverse-bias current–voltage (I–V) and capacitance–voltage (C–V) characteristics of Sn/p-Si Schottky structures were measured in the wide temperature range. The main parameters such as factors (n), series resistances (R_S) and barrier heights (Φ_{bo}) obtained from Cheung's and Norde's functions. Also, the temperature dependence of energy distribution of interface state density (NSS) profiles has been determined from I–V measurements by taking into account the bias dependence of the effective barrier height and ideality factor. The ideality factors (n), series resistances (R_S) and interface state densities (N_{SS}) decreased with increasing temperature for Sn/p-Si Schottky structures. The higher values of n and R_S were attributed to the presence of a native insulator on Si surface and to high density of interface states localized at semiconductor–native oxide layer (Si/SiO_2) interface.

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TWO NOVEL FLUORESCENT-BASED DOPAMINE SENSORS: STRUCTURAL CHARACTERIZATION AND SENSING ABILITIES

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In this study, two new imine compounds (**M^1** and **M^2**) derived from 4-formyl phenyboronic acid and 2-amino fluorene or 1,5-diaminonaphthalene were prepared. The molecular structure of **M^1** was determined by a single crystal X-ray diffraction study. In the structure of **M^1**, two molecules are linked by two concordant hydrogen bonds between the boric acid units resulting in a hydrogen bonded dimer. The absorption and excitation/emission properties of the compounds were studied in different solvents. The effect of the solvent on the absorption and emission properties were investigated. The compounds show a strong emission band at 370-425 nm range. The compounds were used as a fluorescent probe for the detection of dopamine. The compound **M^2** exhibited the low LOD (3.8 μM) value and reasonable enhancement constant (K_{sv} = 7.40 × 10^3 M^{-1}) for fluorescent detection of dopamine.

Keywords: Imine compound, X-ray diffraction, Absorption, Photoluminescence, fluorescent dopamine detection.

COMBINING BENZOXAZINE AND KETENE CHEMISTRIES FOR SELF-HEALING OF HIGH PERFORMANCE THERMOSET SURFACES

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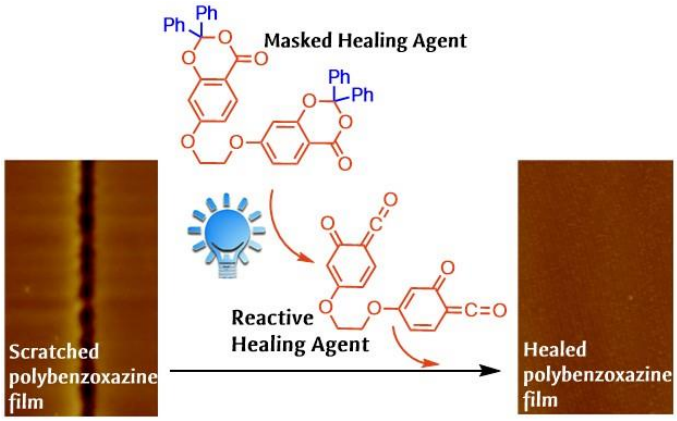
In this work, a novel strategy for the synthesis and characterization of self-healable polybenzoxazine-based high performance thermoset surfaces is presented[1]. The method involves the preparation of polymeric benzoxazine precursors from simple chemicals such as bisphenol A, formaldehyde, polyetheramines (Jeff amines) and subsequent ring opening polymerization followed by light-induced oxoketene formation. The structure and molecular weights of precursor polymers were characterized by FTIR, 1H NMR, and GPC, respectively. Successful self-healable formulations were prepared using bisbenzodioxinone (5 wt %) in the precursors, which were shown to undergo thermally activated curing by the ring opening polymerization of benzoxazines. The thermal properties of the polymers were also investigated by using DSC and TGA. Light-induced self-healing on the surface of the cured specimens was demonstrated and quantified by AFM analysis. The thermal stability differences of the cured and healed products were also investigated and compared.



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PURIFICATION OF CARBONIC ANHYDRASE I AND II WITH AFFINITY CHROMATOGRAPHY COLUMN AND INHIBITION PROPERTIES OF SOME BENZIMIDAZOLIUM SALTS

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The metalloenzyme carbonic anhydrase (CA, EC 4.2.1.1) catalyzes a very simple but critically important physiological reaction: the involvement of the carbonic anhydrase (CA) enzyme family, which catalyzes the physiological hydration of CO_2 to yield bicarbonate and a proton, in many physiological/pathological processes open up widespread opportunities for the development of diverse, specific inhibitors for clinical application [1]. Affinity chromatography is a powerful and generally applicable technique that is distinctly advantageous for the rapid purification of a substance from a complex mixture of proteins [2]. This technique takes advantage of the high affinity of many proteins for specific ligands or chemical groups. Methods for purifying CA-I and CA-II from different tissues by affinity chromatography have been described. Aromatic and heteroaromatic sulfonamides used as ligands in these methods are specific and strong inhibitors of CA [3-5]. A large number of affinity gels, using a variety of matrixes, spacer arms and ligands, have been described in the literature.

In this study, the hemolysate obtained from human blood was applied to an affinity column containing L-tyrosine-sulfonamide-Sepharose-4B to purify the enzymes. The purity of isozymes HCA I and HCA II from the affinity column was assessed by SDS polyacrylamide gel electrophoresis according to the method of Laemmli.

Some of the benzimidazolium salts were used as an inhibitor of the pure enzymes. They inhibited the enzymes. IC50 values of the compounds were found as micromolar levels.

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SYNTHESIS, CRYSTAL STRUCTURE, SPECTRAL CHARACTERIZATION, α–GLUCOSIDASE INHIBITION AND TD/DFT STUDY OF THE Cu (II) COMPLEX

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The Cu (II) complex of 6–methylpyridine–2–carboxylic acid was synthesized and its structure was characterized by XRD, FT–IR and UV–Vis spectroscopic techniques. The α–glucosidase inhibition study of the synthesized complex was determined by IC_{50} values. Furthermore, the optimized molecular structure and vibrational frequencies were obtained by using Density Functional Theory (DFT) with HSEh1PBE/6–311G (d, p)/LanL2DZ level. In order to investigate electronic spectral properties, TD–DFT calculations in ethanol solvent and gas phase were fulfilled. The NLO parameters and FMO energies of complex was calculated by using HSEh1PBE/6–311G (d, p) level. Lastly, to show interacting the binding site of the target protein (the template structure S. cerevisiae isomaltase), the docking study of complex was carried out.

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SYNTHESIS, CRYSTAL STRUCTURE, DFT CALCULATIONS, MOLECULAR DOCKING AND α–GLUCOSIDASE INHIBITION STUDY OF THE Zn (II) COMPLEX

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The synthesized Zn (II) complex of 6–methylpyridine–2–carboxylic acid [Zn (6–mepic)$_2$·H$_2$O]·H$_2$O was characterized by XRD, FT–IR and UV–Vis spectroscopies. The α–glucosidase inhibition study of the synthesized complex was predicted by IC_{50} values. Moreover, the optimized geometry and vibrational frequencies were obtained by using Density Functional Theory (DFT) with HSEh1PBE method and 6–311G (d, p)/LanL2DZ basis set. Electronic spectral properties was studied by using TD–DFT/HSEh1PBE/6–311G (d, p)/LanL2DZ level with CPCM in ethanol solvent and gas phase. The NLO parameters and FMO energies of Zn (II) complex was calculated by using HSEh1PBE/6–311G (d, p) level. Finally, the docking study of the Zn (II) complex to the binding site of the target protein (the template structure S. cerevisiae isomaltase) is fulfilled.

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ON INEXTENSIBLE FLOWS OF M_2 BISHOP SPHERICAL IMAGES ACCORDING TO BISHOP FRAME IN E^3

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In this paper, we study M_2 Bishop spherical images in Euclidean space E^3. Using the Bishop frame of the given curve, we present partial differential equations. We give some characterizations for curvatures of a curve in Euclidean space E^3.

Keywords: Bishop frame, Euclidean 3-Space, Curvatures, Flows.

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ON THE PRINCIPAL NORMAL AND TRINORMAL SPHERICAL INDICATRICES OF A SPACELIKE W-CURVE WITH TIMELIKE PRINCIPAL NORMAL VECTOR IN MINKOWSKI SPACETIME

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In this study, we investigate the principal normal, trinormal spherical indicatrices of a spacelike W-curve in Minkowski space time E_1^4. All spherical images studied in this work are spacelike curves. The Frenet-Serret invariants of the mentioned indicatrix curves are obtained in terms of the invariants of spacelike W-curve. Also some characterizations for these spherical indicatrices to be ccr-curves and general helices are studied in Minkowski spacetime.

Keywords: Minkowski Space Time; Spherical indicatrix; Spacelike W-curve.

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ON THE SPHERICAL INDICATRICES OF PARTIALLY NULL CURVES IN MINKOWSKI SPACE-TIME

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In this study, we investigate the tangent, principal normal, and trinormal spherical indicatrices of a partially null curve in Minkowski space time E_1^4. All these spherical indicatrices are spacelike curves in Minkowski space-time. We obtain the Frenet-Serret invariants of these spherical indicatrices in terms of the Frenet-Serret invariants of the base curve, and study characterizations of these curves as ccr-curves and general helices.

Keywords: Minkowski Space Time; Spherical indicatrix; Partially Null Curves.

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THE INFLUENCE OF *ORIGANUM VULGARE* L. ON HEMOLYSIS AND OXIDATIVE DAMAGE IN HUMAN ERYTHROCYTES EXPOSED TO HIGH GLUCOSE CONCENTRATION

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Hyperglycemia was found to increase the production of reactive oxygen species (ROS), leading to oxidative damage and hemolysis [1]. Erythrocytes are the primary targets free radicals owing to their high membrane concentration of polyunsaturated fatty acids which are potent promoters of ROS [2]. *Origanum vulgare* L. has been used in traditional native herbal medicine of Turkey [3]. The purpose of this study was evaluate the effects of *O. vulgare* on oxidative damage and hemolysis in an experiment model of hyperglycemia in human erythrocytes in *vitro*. Human erythrocytes were treated with 20 mM and 40 mM glucose in the absence or presence of five different doses of *O. vulgare* aqueous extracts in the culture medium of 24h. After incubation malondialdehyde (MDA) and hemolysis (%) levels were analyzed. When the % hemolysis values of erythrocytes which were treated with only glucose and erythrocytes which were treated with the aqueous extracts of *O. vulgare*, the % hemolysis values of erythrocytes treated with the aqueous extracts of were determined to be lower. The lowest % hemolysis values were determined to be from 200 µg/ml concentration *O. vulgare* aqueous extracts (for 20 mM glucose, 2.67%±1.38; for 40 mM glucose, 4.43%±2.86). When the MDA levels were investigated, the MDA levels of erythrocytes which were treated with glucose as well as plant extracts have been determined to be lower. The MDA levels for 20 and 40 mM glucose were 296.5±0.058 (nmol/gHb) ve 349.2±0.051 (nmol/gHb) respectively while the MDA levels for 20 mM glucose and 200 µg/ml plant extract treated erythrocytes was 229.6±0.021 (nmol/gHb), and the 40 mM glucose and 200 µg/ml plant extract treated erythrocytes MDA value was 271.4±0.07 (nmol/gHb). These results imply that *O. vulgare* may have protect human erythrocytes exposed to high glucose concentration against oxidative damage.

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INVESTIGATION AND IMPROVEMENT OF MECHANICAL DEFORMATION BEHAVIORS AND DEPRESSION RESISTANCE OF CONCRETE STEEL BARS

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The main factors affecting the mechanical properties of ribbed concrete steel bars are chemical structure and production techniques. Standards have been characterized depending on chemical structure and production techniques for many different types of depression resistant ribbed concrete throughout the world. However, there is a certain uncertainty for the depression resistant ribbed concrete steel. The purpose of this study is investigation of the production techniques and steel chemical structure effect on steel bars resistant to earthquakes. In addition, a new standard about depression resistant ribbed concrete steel production is also be reported in this study. Steel logs having different type chemical structure were provided from İÇDAŞ steel hanes. Ribbed concrete steel bars with a diameter of 16 mm were produced by 3 different production technique (hot rolling, thermex process and alloying method with vanadium). Thus the effect of different production techniques on the resistance to depression is investigated. In addition, chemical structure differences of steel logs was also investigated to produce ribbed concrete steel bars with a diameter of 16 mm by hot rolling method. The mechanical test of steel bars were characterized by tensile strength, elongation at break, fatigue test. As a results of chemical analyses and mechanical test is showed that the mechanically more robust steel bars having 0.19 C % and 0.57 Mn % were produced by the hot rolling method. The best standard range for steel bars against depression resistance of concrete steel bars is found as min yield strength 320 MPa, min tensile strength 500 MPa and chemical content 0,18-0,22 C % and 0,55-0,70 Mn %.

CHEMICAL SYNTHESIS, DIELECTRIC AND OPTOELECTRONIC CHARACTERIZATION OF POLY(2-ANILINOETHANOL) DOPED WITH ORGANIC ACIDS

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Polyaniline and derivatives are important electronic materials because of its easy synthesis, environmental stability, reversible proton dopability, redox recyclability, cost-effectiveness, and reasonable electrical conductivity compare the other conducting polymers [1]. These polymers are the most promising conducting materials for their varied technological application areas [2,3].

In this work, 2-anilinoethanol was polymerized oxidatively in the presence of different acids such as 3- thiophene acetic acid, acetic acid, citric acid etc. as dopants and ammonium persulfate as initiator.

The obtained polymers were characterized by using spectrophotometric methods such as FT-IR, UV-Vis and NIR. Dielectric parameters, electrical conductivity and band gap values of the polymers was investigated.

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ELECTROMAGNETIC INTERFERENCE PROPERTIES OF SN DOPED ZNO SEMICONDUCTORS

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The microwave dielectric properties of Sn doped ZnO samples have been investigated as a function of microwave frequency in the range of 1 to 20 GHz. The applicability of Sn doped ZnO samples for electromagnetic wave shielding effectiveness at microwave frequency was studied. The real and imaginary parts of reflection of the Sn doped ZnO samples were changed with Sn doping. With Sn doping, the real part of the reflection is decreased with Sn doping.

A maximum reflection for 0.5 Sn doped ZnO sample was observed at about 15 GHz. The obtained results indicate that zinc oxide can be used for various electromagnetic wave shielding applications at microwave frequency.

Keywords: Zinc oxide; Electromagnetic reflection

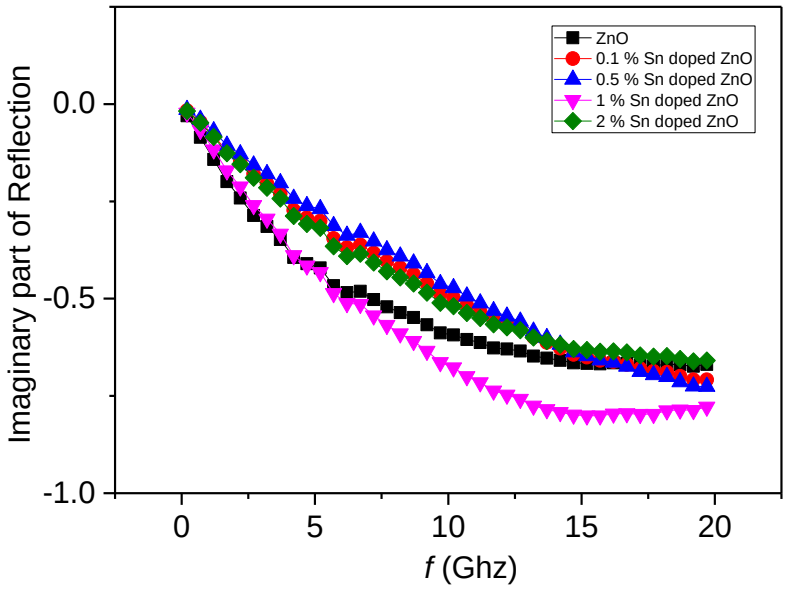

Fig.1 Imaginary Part Plots of Reflection of Sn Doped Zno Samples

PHOSPHORUS DOPED GRAPHENE OXIDE BATTERY

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The graphene is an attractive material for various applications such as batteries, supercapacitors, sensors, and nanocomposites. In this work, we have utilized low cost synthesized graphene oxide for power generation applications. Phosphorus doped graphene oxide was synthesized using modified Hummer's method. The electrical characteristics of the phosphorus doped graphene oxide battery were obtained at room temperature and are shown in Fig.1. The battery shows a high open circuit voltage (~1 V) and short circuit current (0.52 mA). The maximum power of the battery was found to be a of 0.15 mW. The obtained results indicate that phosphorus doped graphene oxide battery can used for millipower applications.

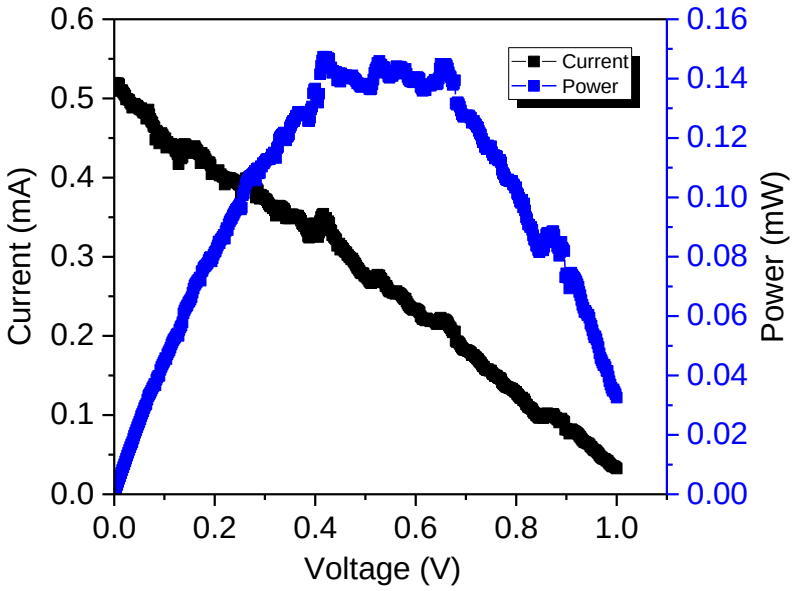

Fig.1 I-V-P Characteristics of Phosphorus Doped Graphene Oxide Battery

INVESTIGATION OF Cu-ENDOSULFAN CORRELATION IN WATER SAMPLES BY USING ICP-OES AND GC-MS

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The pesticides and metals are considered a rising concern in the environment because their presence in lower concentrations, which have associated with endocrine disruption, acute toxicity and bioaccumulate. It is known that drugs in the fungicides group, which is one of the drug types used in the agricultural struggle, which containing copper at high level. It is also known that drugs containing Endosulfan, the active ingredient of the insecticide group, are still used in agriculture, although the fight against insects is prohibited.

In the study, total Copper and Endosulfan contents were determined in water samples collected from the determined points in the agricultural lands in Trakya region. Copper content in the samples was determined by using ICP-OES, after burning the samples in the microwave system with acid mixture. The method used was verified by standard reference material analysis. For the analysis of Endosulfan insecticide, the enrichment technique was used with the SPE method and the residue analysis in water samples was performed by GC-MS. According to the Pearson Correlation Coefficient evaluation, there is a medium-level correlation relationship between Cu-Endosulfan.

Keywords: Water, Endosulfan, SPE.

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DETERMINATION WITH QUECHERS EXTRACTION METHOD OF IMAZAMOX IN ROOT AND LEAF OF THE SUNFLOWER PLANT BY GC-MS

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Sunflower (Helianthus annuus L.) is the most important oil plant grown in our country. In our country, %60 of sunflower production is done in Thrace region and pesticides are used extensively in this agriculture, especially imidazolinone (IMI) herbicides. Because, these herbicides (Imazapyr, Imazapic, Imazethapyr, Imazamox and Imazaquin) are known to inhibit the biosynthesis of aromatic and branched-chain amino acids [1]. It is used systems such as GC-MS, LC-MS, LC, GC, LC-MS-MS and GC-MS-MS for determination of pesticides.

The aim of this study was to evaluate the application of quick, easy, cheap, effective, rugged and safe method for simultaneous determination of Imazamox and pesticide residues in sunflower plant parts (root and leaf). The samples prepared with QuEChERS extraction method were analyzed by gas chromatography-mass spectrometry for Imazamox. The concentration of Imazamox in sunflower plant parts was determined to be among 11.4-27.7 μg kg^{-1} and 4.53-68.8 μg kg^{-1} for root and leaf, respectively.

Keywords: Sunflower plant parts, Imazamox, QuEChERS.

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CROSSLINKABLE ELECTROACTIVE MATERIALS FOR ELECTRCHROMIC APPLICATIONS

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Electrochromic devices have attracted the interest of many researchers by features of high contrast, using of long lifetime, good switching repetability, flexiblity [1]. An ideal electrochromic device should have low electrical requirements, great color efficiency, and good transparency values [2]. Polyfluorene is generally used as blue emmisive materials for OLED applications. Cross-linking of polyfluorene derivatives improve the stability of blue emision due to polymer chains being “locked” into position, significantly reducing their tendency to realign during annealing or device operation. UV-initiated curing reactions are preferred with features such as patterning, or providing the potential for the fabrication of materials with more complex architectures.In this work, the cross linkable Carbazole-fluorene based polymer CF2 synthesized by Suzuki coupling reaction. After the synthesized polymer, ^{1}H-NMR, FT-IR and GPC analyzes are performed for structural characterization of the polymer. The CF2 polymer containing tetrathiol based crosslinker was coated on the film surface by using spin coating method and then exposed to UV radiation at 360 nm. Thus, the surface was cross-linked by patterning with the help of a mask. After the patterning electrochromic devices prepared by sandwich configuration (ITO/PEDOT: PSS/Gel Electrolyte/CF2/ITO) and their spectroelectrochemical properties were examined by UV-Vis and cylic voltammetry (CV). In addition, surface morphologies of the polymer films were examined by Atomic Force Microscope (AFM). Finally, patterned electrochromic device switched between colorless (-1.4V) and blue (1.4V) was obtained by very cheap and simple methods.

Keywords: Electrochromic devices, crosslinkable polymers, electrochromic applications

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DETERMINATION OF ^{137}CS CONCENTRATIONS IN KADIKOY-ISTANBUL

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All living creatures on Earth are constantly exposed to radiation during their lifetime. This radiation can be produced from natural sources or from artificial sources. Soil can act as both natural and artificial radiation source. In addition, the radioactive nucleus in the soil can pass through air, water and some biological systems.

Much more radionuclide has been emitted from nuclear medicine applications, from nuclear reactors, from particle accelerators, from nuclear weapons tests, from nuclear submarine accidents. In April 26, 1986 the radioactive nuclei resulting from the Chernobyl nuclear accident are an increase in radionuclide concentrations in the world and Turkey has caused. For this reason, it is important to know and evaluate the amount of radioactivity in the soil.

In the present study, the activity concentrations of ^{137}Cs in the soil samples measured. Soil samples have been collected from 5 different locations in Kadikoy district (Istanbul) for investigation by gamma ray spectrometer using HPGe detector. The activity concentrations of ^{137}Cs ranged from ND- 5.91±0.36 Bq kg^{-1}.

Keywords: ^{137}Cs, Soil, Radiation, Kadıköy

EFFECT OF Y-DOPING ON ZrO_2: FIRST-PRINCIPLE CALCULATIONS

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Yttria-stabilized zorconia (YSZ) plays a significant role in the performance of solid oxide fuel cell (SOFC). Enhancing ionic conductivity in YSZ been of outstanding interest over the last decade. In this study, we have investigated ionic conductivity in YSZ systems under strain by density functional theory (DFT). DFT within generalized gradient approximation was used to calculate of energy barriers that oxygen ions encounter during migration in YSZ by a vacancy mechanism. In our previous study showed that the structural and mechanical properties of YSZ. In the present study, we demonstated that at a certain oxygen vacancy concentration, the effects of Y doping on ZrO_2 from the point of ionic conductivity.

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STRUCTURAL, OPTICAL AND ELECTRICAL PROPERTIES OF Ag DOPED ZnO THIN FILMS DEPOSITED BY SOL-GEL PROCESS

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Structural, optical and electrical properties of Ag-doped ZnO nanostructure semiconductor thin films prepared by sol–gel spin coating method have been investigated. The micro structural analyses of thin films were done by Scanning Electron Microscope (SEM).The crystal structures of ZnO samples were analyzed by X-ray diffraction (XRD) technique.The Schottky diodes with the configuration of Al/p-Si/1%Ag-ZnO:N/Al have been fabricated and it has been observed that the diodes exhibit a good rectification. The electrical parameters such as ideality factor, barrier height and series resistance of the diode were determined using Cheung's and Norde's method. The frequency dependent electrical properties of Al/p-Si/1%Ag-ZnO: N/Al structure has been investigated using capacitance–voltage (C–V) and conductance–voltage (G–V) characteristics in the frequency range 10 kHz–1 MHz in the room temperature. The increase in capacitance at lower frequencies is observed as a signature of density of interface states. It is evaluated that the prepared diodes can be used as nanoscale electronic and optoelectronic devices.

Acknowledgement: This study was funded by Kırklareli University Research Funding through BAP Project (Project No: KLUBAP-136, 2018).

INVESTIGATION OF ELECTRO OPTICAL PROPERTIES OF VARIOUS POLYMER-DOPED LIQUID CRYSTALS

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Liquid crystals find vast area of applications in technological devices due to their thermal and optical properties. In this study, the electro-optical of 4-cyano-4'-n-pentylbiphenyl (5 CB) liquid crystal doped by various polymers have been investigated. New liquid crystals were synthesized by doping 5CB liquid crystal with various dopants. Dielectric anisotropy properties of the liquid crystals were defined using Capacity-Voltage measurement method. It is seen that dielectric-anisotropy properties of the liquid crystals give different values for different dopant.

It was seen that the dielectric properties of the liquid crystals increased with temperature was observed. In addition, electro-optic of the liquid crystals alter with doping.

Key Words: Liquid Crystal, Dielectric Anisotropy, Electro-Optical Properties

INVESTIGATION OF PHASE TRANSITION PROPERTIES OF VARIOUS POLYMER-DOPED LIQUID CRYSTAL

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Phase transitions in liquid crystals have been intensively studied during the last 40 years due to their numerous daily technological applications. The nematic liquid crystal the phase transition of 4-cyano-4'-n-pentylbiphenyl (5 CB) liquid crystal doped by various polymers have been investigated. New liquid crystals were synthesized by doping 5CB liquid crystal with various dopants. Phase transition properties of samples were calculated using dielectric constant- temperature method. Dielectric constant increases with temperature and shows phase transition peak.

It is seen that phase transitions properties of the liquid crystals give different values for different dopant. In addition, phase transitions of the liquid crystals alter with doping.

Key Words: Liquid Crystal, Dielectric Anisotropy, Phase Transitions

ANALYTICAL SOLUTION OF SCHRODINGER EQUATION FOR A 2D CHARGED PARTICLE CONFINED BY EXTERNAL MAGNETIC AND AB FLUX FIELDS UNDER POWER INTERACTION POTENTIALS

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Exact eigenstate solutions of radial Schrödinger equation for a 2D charged particle interacting via a radially symmetrical potential under the external uniform magnetic field and Aharonov-Bohm (AB) flux fields are obtained by using extended Nikiforov-Uvarov (NU) method. The method is improved by changing the boundary conditions of the NU method in order to solve second order differential equations which have at most four singular points. Wave function is achieved in terms of biconfluent Heun polynomials without using any procedure for tranformation of radial Schrödinger equation to biconfluent Heun equation. Hereby various coordinate transformations or ansatzs in tradional solution methods are eliminated by extended NU method.

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A NOVEL MICROPOROUS COMPOSITE MATERIAL FOR VACUUM INSULATION PANELS

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As a consequence of increasing ecological concerns and regulations, the appliance manufacturers are in search of technological solutions that promise to decrease the energy consumption of the appliances. In the refrigeration appliances, this aim can only be achieved by enhancing the refrigeration system or the insulation system of the said appliances. The utilization of vacuum insulation technology in household refrigeration applications has been found out to be a promising solution for the reduction of the energy consumption in the said area of application. As a strong alternative to the conventional insulating techniques, vacuum insulation technology is based on wrapping an open celled core material in a barrier material and then evacuating it before sealing to the atmosphere. Evacuation leads to the reduction of the gaseous conduction that is caused by the air in the pores of the core material. Vacuum insulation panels (VIPs) are being utilized by refrigerator manufacturers worldwide [1].

A lab-scale plant for microporous silica powder based VIP production has been constructed during this study. By operating the plant, all kinds of microporous powder insulators can be dried, evacuated and filled into VIP jackets, and then the said box being hermetically sealed to the atmosphere. Thus can be produced an evacuated, dense, low thermal conductivity insulation element. A box which is produced in this way, is the simulation of the VIP freezer door of a refrigerator. By some performed measurements and simulations on the silica material and the produced silica based VIC box, the deterioration of the VIP inner pressure due to time and the effect of vacuum on the thermal conductivity of silica material has been researched. Resulting this study, it is being proposed to study on the optimization of the powder material based VIP production technique.

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ANALYSIS OF POLYSTYRENE AND POLYCARBONATE USED IN MANUFACTURING OF WATER AND FOOD CONTAINERS USING LASER INDUCED BREAKDOWN SPECTROSCOPY

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Laser-induced breakdown spectroscopy (LIBS) is one of the analytical techniques which have vast application in the material analysis. We have applied the technique for the elemental analysis to find impurities and hazardous elements in polystyrene, polycarbonate materials from one of the Saudi industries which are being used in manufacturing of water and food containers. The aim was to identify the harmful elements present in these polymers.

In this study a laser beam is focused on the target to generate plasma and after cooling the plasma the emitted light is collected with optical fiber and analyzed through spectrometer.

The study was carried out in high vacuum chamber using Q-switched pulsed Nd: YAG laser to generate the plasma of the sample placed on rotating stage in the vacuum chamber.

Al, Si, P, Ca, Mg, N in Polystyrene and Br, Mg, Ca, N in polycarbonate were found as impurities in the samples respectively. We have also detected molecular lines of CN, CO, C_2 and CH in these samples. Presence of Al, Si, and P might be harmful to the human body. LIBS is found to be simple and cost effective method to identify the hazardous element. The industries can adopt this technique to provide harmless container for water or food products.

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BANDGAP TUNING AND STRONG BLUE-GREEN BAND EMISSIONS OF SOL-GEL SYNTHESIZED ZnO FILMS BY HIGH Cu DOPING

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Undoped and Cu doped ZnO thin films onto glass substrates with different Cu doping concentrations (0.0%, 0.8%, 3.0%, 5.0%, 10.0% and 20.0%) have been synthesized using sol-gel spin coating technique. The XRD patterns show that undoped and Cu doped ZnO films crystallized in hexagonal wurtzite structure. The films have the strongest reflection at (002) plane indicating preferential orientation along the c-axis. The absorption spectrum recorded the fundamental absorption edge and it gradually exhibits redshift with the increase of Cu concentrations. All prepared films showed a high transmittance above 70% in the visible region. The energy gap Eg for undoped ZnO films was found to be 3.239 eV and showed a little increase to 3.248 eV after doping with 0.8% Cu concentration and is attributed to Burstein-Moss shift. However, with further increase of Cu doping concentration in ZnO films, the energy gap Eg is decreased from 3.248 eV to 3.107 eV for 20% Cu doping concentration. This decrease is due to the creation of different impurity levels in the forbidden energy region in ZnO lattice which act like recombination centers and this leads to band gap narrowing. The Urach energy is increased as Cu doping concentration increased; the increase in the amount of Eu indicates the disorder of the films, due to the presence of defects and impurities in the film structure with increasing Cu doping concentration. The photoluminescence (PL) emission spectra of the films show ultraviolet (UV) and blue-green band emissions. The UV peak intensities are decreased with increasing Cu doping concentration and the blue peaks intensities are increased with the increase of Cu concentration. These results show that Cu doped ZnO films are suitable for applications in different blue emission devices.

3rd International Conference on Organic Electronic Material Technologies (OEMT2018)
Sep 20-22, 2018, Kırklareli / TURKEY

ELECTRICAL CONDUCTIVITY, SEEBECK COEFFICIENT AND OPTICAL PROPERTIES OF SnO_2 FILM DEPOSITED ON ITO BY DIP COATING

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Electrical and optical properties of SnO_2 film deposited on indium tin oxide substrate by dip coating have been investigated. The electrical conductivity of the SnO_2 film exhibits the extrinsic conductivity mechanism with two shallow and deep donor levels. The current voltage characteristics of SnO_2 film confirm the presence of space charge limited conduction. The density of states at the Fermi level $N(E_F)$ for the SnO_2 film was determined using current–voltage characteristics and was found to be 1.63×10^{16} eV^{-1} m^{-3}. The Seebeck coefficient of the SnO_2 at room temperature indicates the n-type electrical conductivity. The Seebeck coefficient suggests that the electrical conductivity of the SnO_2 film varies from n-type conductivity to p-type conductivity with increasing temperature. The optical constants, such refractive index as dielectric constants, were determined from the reflectance, transmittance and absorption.

PHOTOVOLTAIC PROPERTIES OF THE ORGANIC–INORGANIC PHOTODIODE BASED ON POLYMER AND FULLERENE BLEND FOR OPTICAL SENSORS

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In this work, we have systematically investigated the effects of illumination intensity on the electrical characteristics of GaFeO3/p-Si heterostructure. The current–voltage (I–V) measurements of the heterostructure based on GaFeO3 thin film were performed in dark and under different illumination intensities. The photocurrent in the reverse biased I–V measurement is strongly sensitive to photo-illumination. The ideality factor (n) and zero-bias barrier height were found to be strongly illumination dependent and while decreases, n increases with decreasing illumination. From capacitance–voltage (C–V) characteristics, it has been seen that the capacitance decreases as the frequency increases, exhibiting a continuous distribution of the interface states at frequency range 10 kHz to 1 MHz. The interface state density was determined by conductance method for dark conditions. It is believed that the combination of p-Si and thin $GaFeO_3$ layer will provide new opportunities as a photodiode sensor for visible light sensor applications.

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PREPARATION AND OPTICAL CHARACTERIZATION OF CdS/ZnS-POLYMER SUPERLATTICE NANOCOMPOSİTES

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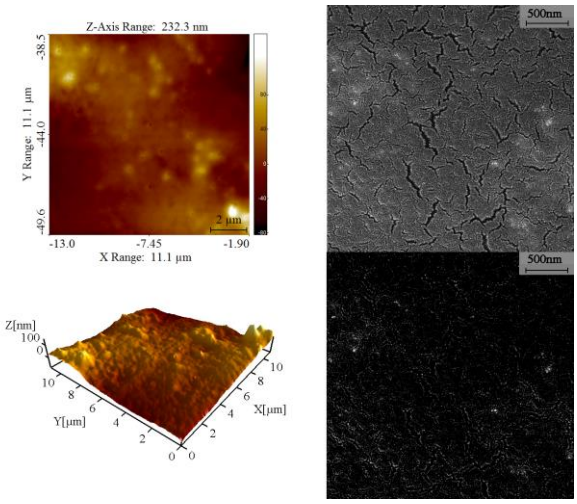
In this study, size-tunable CdS/ZnS-polymer superlattice nanocomposite materials[1] were successfully prepared using SILAR method[2]. Field Emission Scanning electron microscopy (FE-SEM) and Atomic Force Microscopy (AFM) was used for morphological, structural and porosity determination of the prepared nanocomposite materials. UV-Visible absorption spectroscopy technique was used for investigation of optical properties of the prepared nanocomposite. The confinement of electrons and holes in semiconductor nanostructured materials was observed in lower cycles of SILAR. The analyses of abtained results confirms that with increasing in particles sizes, a red shift was observed at the position of the peak in the absorption spectrum and consequently optical band gap decreases.
The figure in below shows SEM and AFM Images of the surface morphology of CdS/ZnS-polymer superlattice nanocomposite materials after 16 cycles of SILAR.



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STRUCTURAL AND MAGNETIC PROPERTIES OF $CoFe_2O_4$/ Fe_3O_4 / POLYVINYLPYRROLIDONE NANOPARTICLES

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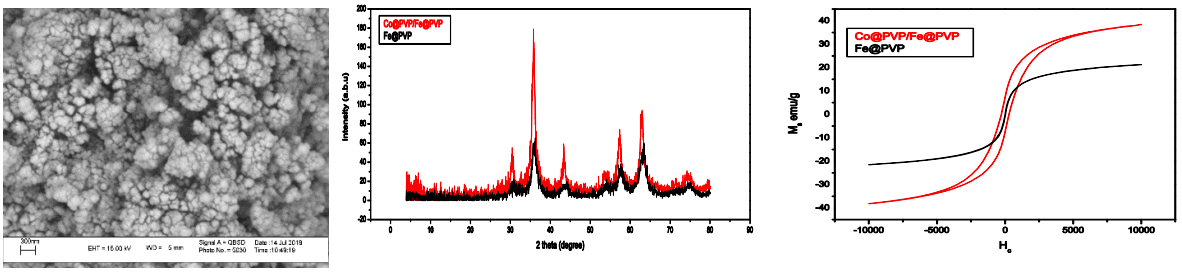
In this work, the effects of cobalt ferrite@PVP on the physical properties of Fe_3O_4@PVP have been investigated. Cubic spinel structure of the samples confirmed by X-ray diffraction patterns (XRD) [1]. In addition, the obtained images from Scanning electron microscopy (SEM) together with XRD results showed that the size of particles is under 50 nm. Vibrating sample magnetometer (VSM) used for magnetic investigation at room temperature under 10KOe applied a magnetic field. According to too the hysteresis loop of Co@PVPFe@PVP sample, the coercivity, and saturation magnetization increased by adding cobalt ferrite@PVP to the Fe_3O_4@PVP samples.



(a) (b) (c)

Figure 1. (a) SEM image $CoFe_2O_4$/ Fe_3O_4 / PVP (b) XRD patterns of $CoFe_2O_4$/ Fe_3O_4 / PVP and Fe_3O_4 / PVP nanoparticles and (c) hysteresis loops of $CoFe_2O_4$/ Fe_3O_4 / PVP and Fe_3O_4 / PVP nanoparticles

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APPLICATION OF POLY (VINYL ALCOHOL) / NaY ZEOLITE MIXTURE MEMBRANES IN PERVAPORATION METHOD

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Pervaporation (PV) is a novel membrane separation technology for liquid mixture separation, in particular, for azeotropic mixtures [1]. Besides, PV is demonstrated advantages for safely handling heat-sensitive and hazardous compounds owing to its mild operation conditions, relative simplicity, environmental benignity and low energy cost [2].

The aim of this study is to investigate the pervaporation performance of isopropyl alcohol / water mixtures by preparing poly (vinyl alcohol) (PVA) and sodium Y (NaY) zeolite mixtures membranes. The effects of various parameters such as NaY zeolite percentage, membrane thickness, feed composition, operation temperature on the pervaporation separation factor and flux were investigated.

Keywords: Pervaporation, PVA, NaY Zeolite, Membranes.

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SOLAR LIGHTRESPONSIVE ZnO NANOPARTICLES ADJUSTED USING Cd AND La Co-DOPANT PHOTODETECTOR

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Optical sensing from the solar light range of light is very important for industrial process monitoring and life science. Hence, we present inorganic photodetector, operating between 200 and 1200 nm wavelength invented (Cd0.1/xLa co-doped ZnO, x=0.1, 0.5, 2, and 4 Wt%) nanoparticles thin films were synthesis onto p-Si and glass substrates by the Sol-gel spin coating technique. The films indicate that a high transmittance about 92% in the visible region. The optical bandgap of the thin films was used optical data demonstrated that the band gap of the films decreased with dopant concentration. The surface morphology and elemental compositions were investigated by SEM and EDX. The diodes exhibited high photocurrent responsivity under various illuminations. Herein, from I-V characteristics determined the electronic parameters such as ideality factor, barrier height and series resistance. The C-V and G-V of the diodes were investigated in the range of 10-1000 kHz. Moreover, an approach to improve the Ion/Ioff ratio (photoresponse) by modifying the concentration has been investigated under dark and light illuminations, respectively. The Al/p-type/Cd(0.1)-La(0.1)Wt/Al photodetector exhibited a highest photo-response were found to be 2263. Finally, the interface states were determined to explain the results obtained in the present study. The obtained results suggest that Cd/La-co-doped ZnO/p-Si diodes can be enhanced and pave the way for its potential application in the optoelectronic devices e.g. photodetectors.

Keywords: Co-dopedZnO, Sol-gel, Electricalproperties, Photodetector.

EFFECTS OF SOURCE-DRAIN METAL ON ELECTRICAL CHARACTERISTICS OF BOTTOM – GATE POLY (3 – HEXYLTHIOPHENE) (P3HT) BASED OFET

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During the last several decades, solution - processible OFETs have received considerable attention due to their potential applications in low cost, flexible, low temperature and large area devices; such as active matrix organic displays, chemical sensors, logic circuits and flexible integrated circuits. In this study, we fabricated bottom-gate top-contact poly (3–hexylthiophene) (P3HT) based organic field-effect transistors (OFET) on gold (Au)-coated glass substrates which functioned as the gate electrode. Silver and gold (Ag-Au) were selected as source-drain electrodes and were deposited using thermal evaporation system in high vacuum ambient ($<10^{-6}$ mbar). Thermoplastic Polyurethane (TPU) as gate dielectric was deposited onto the Au, gate electrodes by using electro-spinning method. The samples which were fabricated in top contact bottom gate structure were examined using semiconductor characterization system (Keithley 4200 SCS) in air ambient and results were discussed.

POSTER PRESENTATION

A SPECTROSCOPIC STUDY ON THE CHELATING ACTIVITY OF IRON (II) IONS OF ROWANBERRY EXTRACTS

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Free radicals, atoms or molecules containing one or more unpaired electrons. Such materials are highly active due to unpaired electrons [1]. The unpaired electron is generally indicated by a dot at the top. In biological systems, free radicals are most commonly involved in electron transfer. Free radicals can be positively charged, negatively charged or electrically neutral. They can be either organic or inorganic molecules [2].

Cu^{2+}, Fe^{3+}, Mn^{2+} and Mo^{5+} have unpaired electrons, they are not considered as free radicals. However, these ions play an important role in the formation of free radicals because they catalyze reactions [3].

In this study, the chelating activity of iron(II) ions of water and acetone extracts of rowanberry was determined in various *in vitro* systems. The chelating activity of the iron(II) ions of the extracts at different concentrations was performed according to the method of Oyaizu et al [4]. EDTA, BHA and BHT were used as standard for the assessment. Metal chelating activity was calculated as a percentage in these assessments.

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Acknowledgment: This study was supported by Trakya University Scientific Research Projects Unit (TÜBAP) under the project no: 2017/74.

A SPECTROSCOPIC STUDY ON THE DETERMINATION OF TOTAL FERRIC (Fe^{3+}) IONS REDUCTION CAPACITY OF ROWANBERRY EXTRACTS

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Fe and Cu, which are the most important transition elements, catalyze free radical reactions and accelerate free radical reactions. Because of this, Fe^{3+} has a toxic effect. While Fe is a more effective metal to promote oxidative reactions, Cu-catalyzed reactions are not yet certain [1].

Fe in biological systems, has important roles in oxygen transport, ATP production and chlorophyll synthesis, but free forms are toxic to cells. Reactive oxygen species generated by this toxicity initiate lipid peroxidation and lead to DNA damage. All living cells have mechanisms that destroy the toxic effect of free ions and store non-toxic forms in the cell [2].

In this study, the reduction capacity of total ferric (Fe^{3+}) ions of acetone and water extracts of rowanberry was determined. The total reduction capacity of the extracts was determined according to the Oyaizu method [3]. Ascorbic acid, BHA, BHT and α-tocopherol was used as standards. High absorbance value is indicative of high reduction capacity.

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Acknowledgment: This study was supported by Trakya University Scientific Research Projects Unit (TÜBAP) under the project no: 2017/74.

THE SYNTHESIS OF RuO_2, rGO/RuO_2 AND rGO/RuO_2/PVCz NANOCOMPOSITES AND THEIR SUPERCAPACITORS

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In this study, rGO, rGO/RuO_2 and rGO/RuO_2/PVK nanocomposite were synthesized via in-situ polymerization technique. We reduced GO with microwave-assisted method to form rGO. Nanocomposite materials were characterized by Fourier-transform infrared spectroscopy-Attenuated transmission reflectance (FTIR-ATR), scanning electron microscopy (SEM), and energy-dispersive X-ray analysis (EDX), thermal-gravimetric (TGA-DTA) analysis, transmission electron microscopy (TEM), X-ray diffraction (XRD), and BET surface analysis. Electrochemical performances were taken by cyclic voltammetry (CV), galvanostatic constant current (GCD), and electrochemical impedance spectroscopy (EIS) as two electrode configuration.

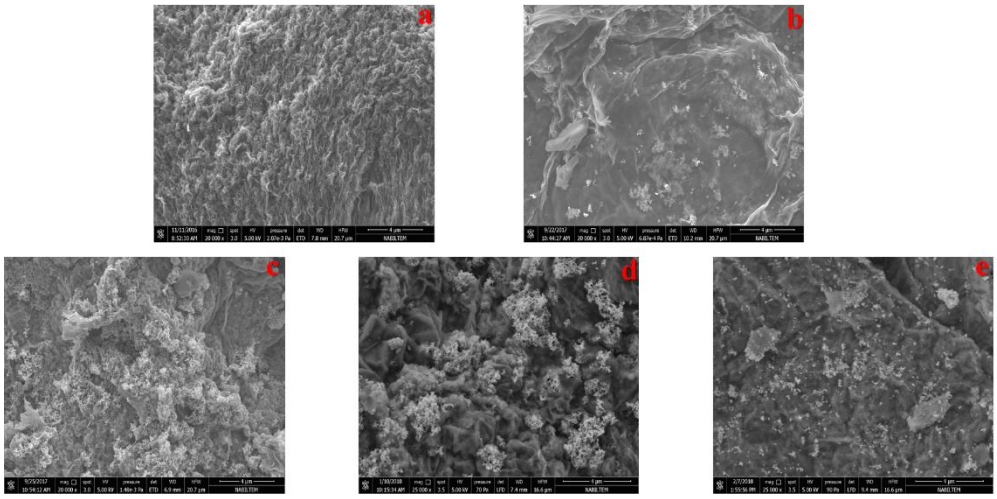

Figure1. SEM images of **a)** rGO, **b)** rGO/RuO_2 **c)** rGO/RuO_2/PVCz, $[rGO]_o/[VK]_o$= 1:1 **d)** rGO/RuO_2/PVCz, $[rGO]_o/[VK]_o$= 1:3 **e)** rGO/RuO_2/PVCz, $[rGO]_o/[VK]_o$= 1:5.

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ANTIBIOTIC ADSORPTION BY ACTIVATED CARBON FROM SEED BALLS OF SYCAMORE TREE

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Antibiotics are natural or synthetic materials providing a significant way to get rid of diseases. However, antibiotics enter into the environment with various waste streams such as pharmaceutical companies, hospitals, and household, which may cause a critical environmental issue for living bodies. To remove pharmaceuticals from wastewater, treatment processes such as reverse osmosis [1], biological filtration [2], activated sludge [3], etc. have been used. Among the treatment processes used, adsorption can be used an efficient method for the antibiotic removal from water and wastewater because it is an effective and simple process. Therefore, in this study, the adsorption performance of the antibiotic removal from aqueous solution by the activated carbon obtained from seed balls of sycamore tree was investigated.

The parameters affecting antibiotic adsorption, such as adsorbent dosage, adsorbate concentrate, temperature, contact time, and pH were studied and evaluated. Adsorption isotherms were investigated by using Langmuir, Freundlich, Tempkin, and Dubinin-Radushkevich isotherm models. Thermodynamic and kinetic parameters were determined. Also, the binding mechanism of antibiotic molecules to the surface was explained.

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POSTER PRESENTATION

PRODUCTION OF ACTIVATED CARBON FROM SEED BALLS OF SYCAMORE TREE

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Activated carbons have specific surface properties and high surface areas, which enables their use in various applications, such as in water treatment [1], personal care products [2], nuclear energy industries [3], batteries and electrodes [4], etc. Also, environmental pollutions [5] and their harmful effects can be prevented by using activated carbons. However, the production costs of activated carbons are quite high, so low-cost alternatives in the production of activated carbons have gained importance. Therefore, in this study, activated carbons were obtained from the seed balls of sycamore tree by using the chemical activation method with $ZnCl_2$.

Parameters affecting the yield and surface properties of the activated carbon obtained, such as impregnation ratio, carbonation temperature and time were optimized to have an activated carbon with the highest surface area. Surface characteristics were explained using various methods such as Thermogravimetric analysis (TGA), Scanning Electron Microscopy (SEM), Fourier Transform Infrared Spectroscopy (FTIR), Elemental Analysis and Brauner, Emmett Teller (BET) analyses. Moreover, resultant N_2 adsorption-desorption isotherms, pore size distributions, and pore volumes were compared according as impregnation ratio, carbonation temperature and time.

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ELECTRICLE AND OPTICAL PROPERTIES OF PHOTODIODE STRUCTURES FORMED BY SURFACE POLYMERIZATION OF P(EGDMA-VPCA)/SWCNT FILMS ON n-Si

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Poly (ethylene glycol dimethacrylate-1-vinyl-1H-pyrole-2-carboxylic acid) /carbon nanotube, single-walled)/n-Si ([P(EGDMA-VPCA)/SWCNT]/n-Si) photodiode structures was fabricated by using surface polymerization method. Electrical and optical properties were carried out at several temperatures. Dark and light current characteristics were investigated. Spectral photo response measurements of the structure was carried out at room temperature. Those were shown that the fabricated structure exhibited rectification behavior that makes it a good candidate for optoelectronic device applications.

THE SIGNIFICANCE OF THE AChe ENZYME-IMMOBILIZED FERROCENE-BASED DENDRIMERS IN THE DETERMINATION OF ORGANOCARBAMATE PESTICIDES

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Pesticides are used to prevent or control the formation of harmful organisms. If there is an interaction between the toxic substances and the acetylcholinesterase in the food chain, the accumulation of acetylcholine in metabolism, which has an important role in the transmission of impulses, occurs. This causes various damage to the cell. For this reason, the identification of toxic substances is of vital importance [1]. One of the methods of identification is the immobilization of acetylcholinesterase on a support [2]. Carbamated insecticides are carbamic acid esters. They bind to the enzyme acetylcholinesterase by chemical bonds and cause this enzyme to be inhibited. In this study, ferrocene-based dendrimers were prepared and the AChE enzyme was immobilized on these dendrimers for the identification of organocarbamate pesticides. As a result of the inhibition reaction of acetylcholinesterase with organocarbamate pesticides, the solution medium changed color. This color change was monitored by absorbance measurements on a UV spectrophotometer to determine the pesticide.

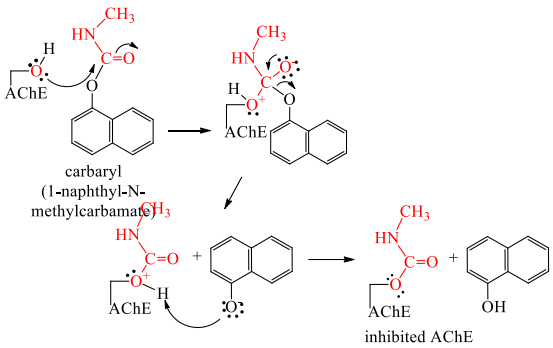

Figure 1. The mechanism of inhibition between AChE and carbaryl (1-naphthyl-N-methylcarbamate)

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THE EFFECT OF SUPPORT MATERIAL ON THE REUSABILITY OF IMMOBILIZED ENZYMES

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Enzymes can be immobilized to various carriers via arrest, adsorption, ionic attachment and covalent attachment. Compared with its natural forms, immobilized enzymes have advantages such as higher stability, easier product and enzyme recovery, possibility of reuse of the enzyme and rapid termination of the reaction [1].The reusability of immobilized enzymes is very important in assessing the efficacy of the selected carrier or method. In addition, immobilized enzymes are more advantageous than free enzymes in terms of economics and stability [2].

In this study, reusability of β-glucose oxidase enzyme immobilized on dendrimers was determined by sequential activity measurements and it was seen that immobilized β-glucose oxidase enzyme lost about 35% of its activity after 10 cycles (Figure 1).

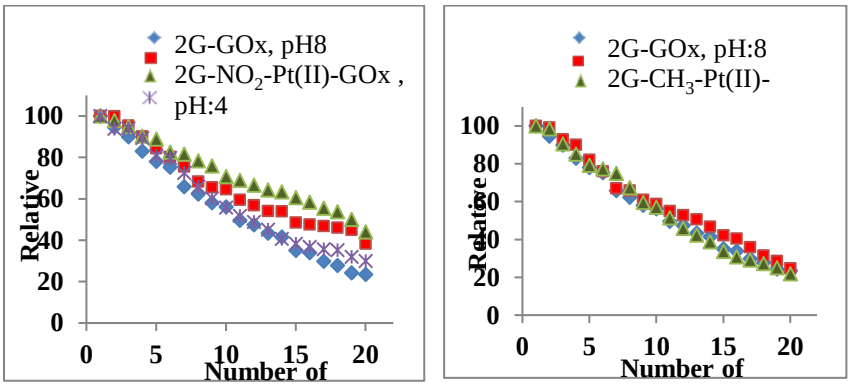

Figure 1. Reusability graphic for immobilized GOx enzyme

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NEW WATER SOLUBLE Zn (II) PHTHALOCYANINE BEARING 7-OXY-4-(PYRIDINE-3-YL) COUMARIN DERIVATIVES

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Photodynamic therapy (PDT) is such a minimal invasive treatment which is currently used for cancer treatment. The therapy drug used for PDT is known as photosensitizer (PS) [1]. Phthalocyanine (Pc) dye family is potent PS. Their structures are porphyrin based and generally include a central atom usually zinc, silicon or aluminum to increase singlet oxygen production [2]. The range of solubility in Pcs becomes very important for their applications, since many Pcs are poorly soluble in organic solvents and water. In PDT applications, the drug is injected into the patient's blood stream and because the blood itself is a hydrophilic system, water solubility becomes crucial for a potential photosensitizer for PDT [3].

The target of our ongoing research is to synthesis water-soluble zinc Pcs as potential PDT agents. In this work, the synthesis, characterization, photophysical (fluorescence quantum yields and lifetimes) and photochemical (singlet oxygen and photodegradation quantum yields) properties of octa-substituted zinc Pcs were reported for the first time.

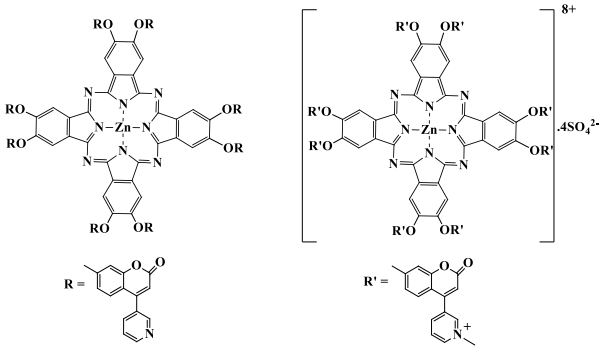

Figure 1. Octa substituted Zn (II) metallo phthalocyanines

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SYNTHESIS AND SPECTROSCOPIC PROPERTIES OF NEW α- / β-SUBSTITUTED Mg (II) PHTHALOCYANINES

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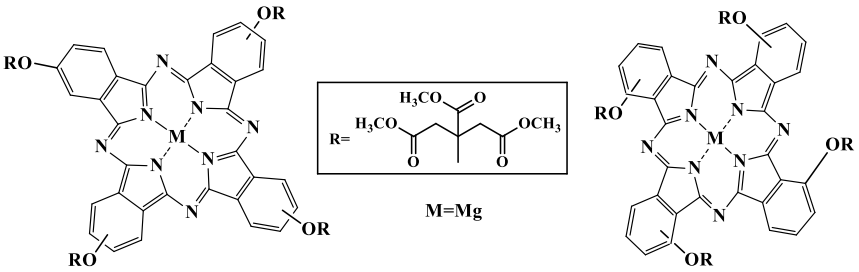
Phthalocyanines (Pcs) are macrocyclic complexes whose π systems, localized over an arrangement of alternated carbon and nitrogen atoms, provide their unique chemical and physical properties, rendering these complexes applicable in different areas, especially in materials science [1]. Pcs can have substituents at α and β positions of the four benzene rings. The photophysical properties of Pc complexes are strongly dependent on the central atom [2]. There is considerable interest in metallophthalocyanine (MPc) complexes containing non-transition metals for use as photosensitizers in the relatively new method of cancer treatment called photodynamic therapy (PDT). The PDT properties of the Pcs are strongly influenced by the presence of diamagnetic central metal ions such as Mg^{2+}, Zn^{2+} and substituents introduced on the periphery of the Pcs [3].

There is a continuous effort to extend the chemistry of MPc complexes. In this work, we report on the effects of peripheral and non-peripheral substitution by trimethyl citrate substituents on the photophysical (triplet state lifetimes and quantum yields, and fluorescence quantum yields) and photochemical (singlet oxygen and photodegradation quantum yields) parameters of MgPc complexes.



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NOVEL COPPER METALLO PHTHALOCYANINES AND SPECTROSCOPIC PROPERTIES

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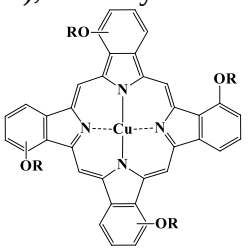
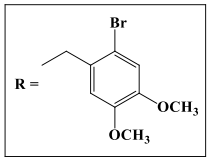
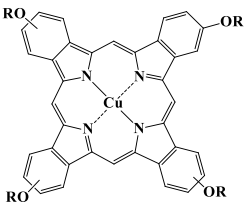
Phthalocyanines (Pcs) are N4-macrocycles known for their very interesting applications due to their high stability, diverse coordination properties, structural flexibility, excellent spectroscopic characteristics, and reversible redox chemistry [1]. Pcs are planar, tetra-dentate macrocyclic ligands which form complexes with a wide variety of metals such as Cu, Zn, Co and Ni. By substituting different metal atoms at the center of the Pc structure in the molecule, changes in the electrochemical, chemical, physicochemical, optical, and magnetic properties are seen. These changes can be further influenced by the peripheral substituents [2].

The original Pc complexes substituted with 2-bromo-4,5-dimethoxybenzyl alcohol moieties both in peripheral and non-peripheral positions were prepared and their structure defined. Their electronic absorption spectra and aggregation properties were investigated in tetrahydrofuran (THF), dimethylformamide (DMF) and dimethyl sulfoxide (DMSO).



Non-peripherally substituted Pc





Peripherally substituted Pc

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THE SUPERCAPACITOR DEVICE PERFORMENCES OF rGO/TiO_2/PANI NANOCOMPOSITES AND ELECTRICAL CIRCUIT MODEL ANALYSIS

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The obtained rGO/TiO_2/PANI nanocomposite films were prepared as two electrodes using pellet machine for supercapacitor device performances. We reduced GO with microwave-assisted method to form rGO. Electrochemical performances were measured by cyclic voltammetry (CV), galvanostatic constant current density (GCD), and electrochemical impedance spectroscopy (EIS) as two electrode configuration. Energy and power density plots and also stability test performances of device were taken in this study. In addition, Randless circuit model of EIS analysis were simulated with theoreticcal and experimental data to interpret the specific capacitance, charge transfer resistance, etc.

Acknowledgements: The authors gratefully acknowledge the Assoc. Prof.Dr. Murat Turkyilmaz for TGA-DTA analysis (Inorganic Division, Trakya University).

CONTROLLING SERVO MOTORS WITH SPEECH RECOGNITION BY USING 802.15.4 WIRELESS PROTOCOL ZIGBEE

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In this work, 802.15.4 wireless communication protocol which has specific name ZigBee is studied. It is very popular wireless technology at last years in electronic society because of relating to the Industry 4.0. ZigBee can connect things, such as, fridge, oven and dishwasher. Even markets, and fridge that is at home can be connected each other. It is known as internet of things (IoT).

With the help of the XCTU Program, the computer and two servo motors are wirelessly connected via XBee modules. Transmitter XBee module is connected to the computer through USB port with XBee USB Explorer and receiver XBee module is connected to the circuit of control of servo motors which are far away from computer about 15 meters. At this stage, arduino duemilanove is also used in control circuits. The codes which understand the commands are embedded in the XCTU Program and the user can control the servo motors with appropriate commands. If the user say ‘right’ the motor of left is run and the motor of right is stopped; as a result, the toy car that has got two motors in wheels turns to the right and vice versa.

MatLab speech recognition is used in this work; consequently, the oral order commands are understood by the computer. They are processed in the XCTU Program. Finally, the commands are sent to the motors through XBee modules. The 15 meter distance between receiver and transmitter can be increased by using intermediate XBee modules. In adition, increasing the power of the transmitter XBee module allows to increase the communication distance.

THE ELECTRICAL AND OPTICAL CHARACTERIZATION OF ELECTRODEPOSITED Ni /n-GaAs SCHOTTKY BARRIER DIODES

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In this paper we report the electrical and optical characteristics of the Schottky diodes formed by electrodeposition of Nickel on n- GaAs from 0.125 M $NiSO_4$ + 0.25 M H_3BO_3 + 0.25 M Na_2SO_4 (pH=4.4) solution. The electrodeposition was performed at room temperature and at -1.5 volts. We measured current-voltage (I-V) between 200 K and 360 K with 20 K temperature and capacitance-voltage (C-V) at room temperature increase. Based on these results, the ideal factor *n*, series resistance R_s and barrier heights Φ_b were calculated from the I-V curve. These values at room temperature are 0.98, 253.64 Ohm, 1.07 eV respectively. The carrier concentration, and the Richardson constant have been calculated from the temperaturedependent C–V–T characteristics. Light current characteristics were investigated. Spectral photo response measurements of the structure are carried out at room temperature.

ELECTRICAL PROPERTIES OF Ag/n-GaAs SCHOTTKY PHOTODIODES

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In this research, electrical and optical properties of metal-semiconductor Schottky diode were investigated. Schottky diode was fabricated by physical vacuum deposition of silver onto GaAs substrate. Ideality factor and barrier height were calculated from current-voltage (*I-V*) and capacitance-voltage (*C-V*) measurements at room temperature and found as 1.8 and 0.72 eV, respectively. It was observed that the diode showed non-ideal behavior because of serial resistance and presence of an interfacial layer. Ideality factor, barrier height and serial resistance values were also determined using Norde's methods and found to be in a good agreement with the values obtained from the *I-V* and *C-V* measurements. Light volt-current characteristics were investigated. Spectral photo response measurements of the structure are carried out at room temperature. Those were shown that the fabricated structure exhibited rectification behavior that makes it a good candidate for optoelectronic device applications.

MODELING AND OPTIMIZATION OF FORMIC ACID ADSORPTION BY MULTIWALL CARBON NANOTUBE USING RESPONSE SURFACE METHODOLOGY

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Formic acid is mostly used in livestock feed as an antibacterial and a preservative agent [1]. Formic acid can be obtained either by using microorganism that is fermentation or chemical process. Nowadays, production of formic acid by fermentation is more economical and environmental friendly. Formic acid is obtained in aqueous solutions as a result of this process. Also, formic acid has been in different industrial wastewaters and effluents in many facilities. For environmental purposes, many separation techniques can be applied for the removal of formic acid from aqueous solutions. With respect to other separation techniques, adsorption has many benefits like higher removal efficiency, easy scale-up and lower process costs. Carbon nanotubes are one of very effective adsorbents because of higher adsorption performance. They have very large surface area and porous-rich structure that ensures interaction diversity between adsorbate and adsorbent. So, carbon nanotubes can be used for separation of many various materials [2].

In this study, the optimal conditions for formic acid adsorption by multiwall carbon nanotube (MWCNT) were investigated by using response surface methodology (RSM). Face-centered central composite design (FCCCD) was applied to investigate the effects of the initial acid concentration (2-10%, w/w), the amount of adsorbent (0.01-0.03 g) and temperature (25-45°C) on the adsorption capacity (q_e, mg acid adsorbed/g adsorbent). The obtained experimental results were evaluated with variance analysis (ANOVA). The model equation for the adsorption capacity was obtained to explain adsorption characteristics of formic acid by MWCNT. The acquired model equation has been good fit with the experimental results. The response surface plots were illustrated and they also supported the compatibility of the model equation.

Acknowledgement

This study was funded by İstanbul University with the Project Number BYP-2018-31279.

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3rd International Conference on Organic Electronic Material Technologies (OEMT2018)
Sep 20-22, 2018, Kırklareli / TURKEY

SYNTHESIS AND CHARACTERIZATION OF NEW STAR-SHAPED MACROMOLECULAR STRUCTURES

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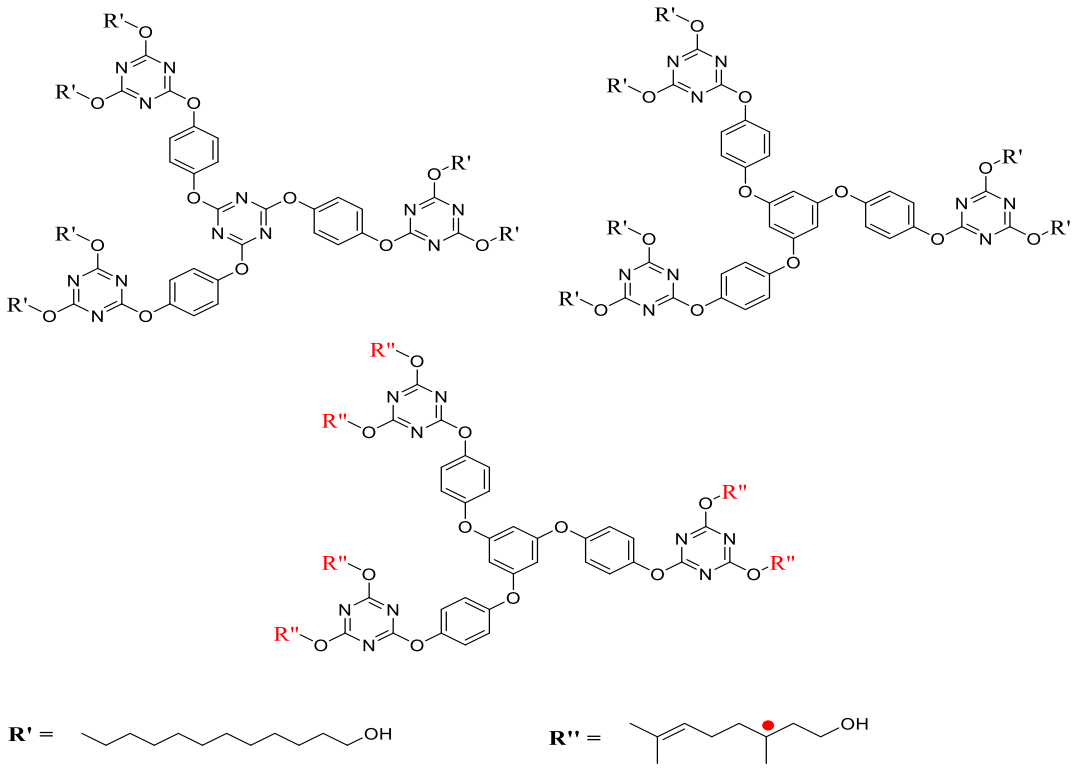

Triazine is known to have a good electron transporting properties we decided to investigate the structure-activity relationships on the newly designed and synthesized macromolecus containing triazine unites. Synthesis and the properties of the macromolecules will be presented.

Acknowledgement: The authors thank to the Funding Office of Yildiz Technical University. Project No: 2015-01-02-DOP04.

DETERMINATION OF ANTIMICROBIAL AND ANTIGENOTOXIC EFFECTS OF POLYMERIC SCHIFF BASE

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Polymeric Schiff bases have been found to possess antitumor, antibacterial, antifungal, antimicrobial and antiviral activities. It has been suggested that the azomethine linkage might be responsible for the biological activities displayed by Schiff bases [1]. Antimutagenic compounds can play a preventative role against mutation-related diseases [2]. Thus, it is important the discovery of new, effective cancer preventing agents. The aim of this study was to evaluate the antimicrobial and antimutagenic activity of polymeric Schiff base.

Previously, the synthesis of polymeric Schiff base (**L_{Cl}**) was reported by us [3]. Herein, the compound (**L_{Cl}**) was screened by the well-diffusion method against some pathogenic strains (*Listeria monocytogenes 4b, Salmonellatyphi H, Bacillus cereus sp., Staphylococcus epidermis, Micrococcus luteus, Escherichia coli, Staphylococcus aureus, Brucella abortus, Proteus vulgaris, Klebsiella pneumonia*) and yeast *Candida albicans*. It was also compared with five commercial antibiotics. Additionally, the antimutagenic effects of (**L_{Cl}**) was investigated against sodium azide in human lymphocyte cells by micronuclei and sister chromatid exchange tests.

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POSTER PRESENTATION

COMPLEX ELECTRICAL MODULUS SPECTRA ANALYSIS OF MULTI WALLED CARBON NANOTUBE DOPED ARDEL COMPOSITES

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Complex electrical modulus analysis is a substantially suitable method in order to investigate the relaxation mechanism of the materials. Electrical modulus corresponds to the relaxation of the electric field in the material. In this context, the investigations on the dominant mechanism of the materials attract more attention for their several device applications. Polyarylates, which is a kind of aromatic polyesters derived from aromatic dicarboxylic acids and diphenols, display excellent thermal resistance and toughness in combination with clarity and ultraviolet stability. Among polyarylates, Ardel has excellent mechanical properties with a high glass temperature, T_g. In this study, we aimed to study the frequency dependences of the real and imaginary components of complex electrical modulus of Ardel/Multi Walled Carbon Nano Tube (Ardel/MWCNT) composites. The composites with varying MWCNT concentrations from 1.5 wt. % to 7.5 wt. % were prepared by melt mixing technique. The micro-structural characterization of the matrix was analyzed by Fourier Transformed Infrared (FTIR) Spectra. Thin sections of samples with a thickness of 2.5mm, which were cut in the Jung RM 2055 Leica microtomie machine at the room temperature, were investigated using phase contrast light microscope. The microscope was equipped with a CCD camera for the digitalization of the images. Obtained images with different magnifications were used to determine carbon nanotube distribution in the polymer matrix. The alternative current (ac) measurements were performed by impedance analyzer between 10 Hz and 40 MHz in an increasing temperature interval. It was determined that the real component of electrical modulus approaches to zero for the frequency interval of 5-1000 Hz. Then it tended to increase with increasing frequency and reached a maximum value. In the frequency dependence of the imaginary component of complex electrical modulus, approximately zero value was obtained up to 100 Hz and then it increased with increasing frequency and reached a maximum value. Low value of complex electrical modulus in the low frequency region supports the long range mobility of charge carries and negligible contribution of the electrode polarization in the material. It was specified that increasing doping concentration of MWCNT decreases the real and imaginary components' values of complex electrical modulus. Additionally, increasing temperature also decreased the complex electrical modulus of the samples. In the light of the results, dominant relaxation of the samples was concluded in details.

POSTER PRESENTATION

THE SPECTROSCOPIC PROPERTIES OF ISOXAZOLOPYRIDINE AND SPIROOXINDOLE DERIVATIVES

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Multicomponent reactions are one of the interesting and important aspects of organic chemistry because it allows synthesis of new carbon-carbon and carbon-heteroatom bonds by reducing synthesis steps and energy consumption by one-pot method [1]. Isoxazolopyridine and spirooxindole compounds from the class of the heterogeneous compounds show many different biological activity properties such as antibacterial, anti-inflammatory, anticonvulsant, muscle relaxant, anti-HIV, anticancer and Alzheimer's disease [2-4]. The isoxazole and spirooxindole derivatives have also potential application in optoelectric devices [5].

In this study, we examined the spectroscopic and photochromic properties of the isoxazolopyridine and spirooxindole derivatives by FT-IR, ^{1}H-NMR, UV-Vis, fluorometer and mass spectroscopy.

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THE SPECTROSCOPIC PROPERTIES OF PYRAZOLOPYRIDINE DERIVATIVES

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The heterocyclic compounds containing the pyrazole ring are extremely important molecules in terms of synthetic and drug chemistry. The pyrazole ring is an important group in the structure of many molecules with biological activity [1,2]. On the other hand, pyrazolopyridine-derived compounds are the most remarkable molecules in recent years. Studies have shown that these compounds have many herbicides and fungicidal properties besides their HIV inhibitor, protein kinase inhibitor, cGMP degradation inhibitor properties [3,4] some derivatives of these compounds have fluorescence properties in the blue-green region, so they can be applied as a fluorescence standard for organic light emitting diodes [5].

In this study, we examined the spectroscopic and photochromic properties of the pyrazolopyridine derivatives by FT-IR, ^{1}H-NMR, UV-Vis, fluorometer and mass spectroscopy.

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SYNTHESIS OF NEW HETEROCYCLIC COMPOUNDS

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Multicomponent reactions allow the building of several new bonds in a single step and therefore these one-pot reactions are one of the most attractive topics in synthetic organic chemistry [1]. Acridine and spirooxindole compounds are in the class of heterocyclic compounds. They exhibit many important biological activity properties. Acridine nuclei substituted with various heterocyclic rings are of interest in the medical sciences. These compounds have showed antibacterial, anticancer, antiviral, antifungal, anti-HIV, and antimalarial activities [2-5].

In this study, we synthesized new acridine and spirooxindole derivatives. The structure of the novel synthesized compounds was confirmed by Fourier transform-infrared (FTIR), ^{1}H, APT NMR techniques and mass spectroscopy.

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THE EFFECT OF GRAPHENE OXIDE ON STABILITY OF PEROVSKITE SOLAR CELL

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Graphene is a single-layered two-dimensional (2D) graphitic carbon material. Due to the significant advantages such as high surface area, excellent electrical conductivity, strong mechanical properties, high thermal conductivity, graphene has been widely studied in various fields including hydrogen storage, rechargeable batteries, perovskite solar cells, super-capacitors, sensors, transparent electrodes, drug delivery, catalysis and etc. [1]. Perovskite solar cells (PSC) have recently emerged as a strong candidate for the next generation of PV technologies. In very short time, power conversion efficiency of PSCs reached already 22%. In literature, different of architectures and fabrication methods of PSC have been proposed and several perovskite compositions have been studied [2].

In this study, we have fabricated perovskite solar cell, $CH_3NH_3PbI_2Cl_2$. Fabrication of solar cells were carried out in glove box atmosphere since perovskite solar cells are easily degraded with O_2 and moisture. It is used one step method that is the MAI and PbI_2 ($PbCl_2$) solutions mixed together with the solvent molecule and baked on hot plate for 24 hours for good dissolution, then it is deposited on the substrate with spin coater. Perovskite formation took place after under thermal annealing. Perovskite solar cells were characterized with AM1.5 Solar simulator. Photovoltaic parameters were found as open circuit potentials (0.94 V), short circuit current (22.5 mA/cm^2), 46% fill factor, 9.77% efficiency. Perovskite solar cell were remained in the glove box for 720 hours, it has %100 stability meaning no decrease in efficiency. The second part of the study, we added graphene-oxide in hole transport layer, and perovskite solar cell were fabricated. The effect of GO were investigated on stability of PSCs.

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INVESTIGATION OF ADSORPTION PROPERTIES OF LEVULINIC ACID BY A NANOTECHNOLOGICAL MATERIAL

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Levulinic acid is a keto acid including both ketone carbonyl and acidic carboxyl groups. It is used in many utilizations such as food, beverage, pharmaceutical, perfumery, plastic and polymer industries [1]. Therefore, it is significant to uptake and purify levulinic acid from effluents and aqueous solutions. Many methods such as extraction, distillation, membrane separation, adsorption are commonly used to uptake levulinic acid. Adsorption has many utilities including high uptake efficiency, simple scale-up and low costs and availability of diverse adsorbents compared to other methods. Carbon nanotubes are versatile nanotechnological materials in a wide range of application fields. They have become one of the most studied nanomaterials because of their physicochemical properties. Also, they are one of the preferred effective adsorbents in adsorption process. Carbon nanotubes have porous-rich structure and very large surface area. That means, they have very high adsorption capabilities and so, they can be used for the removal of many kind of chemicals [2-3].

In this present work, levulinic acid was adsorbed from aqueous solutions by multiwall carbon nanotube (MWCNT). The aim of this work is to determine the adsorption capacity of MWCNT for levulinic acid uptake. Adsorption experiments were performed at batch type. In these experiments, important properties on affecting adsorption such as time, initial acid concentration were investigated. Langmuir, Freundlich and Temkin isotherm parameters were calculated as depended on initial acid concentration. Kinetic models such as Elovich Pseudo-first order, Pseudo-second order and Weber-Morris intra-particular diffusion model were applied to experimental results.

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POSTER PRESENTATION

ADSORPTION OF CIPROFLOXACIN HYDROCHLORIDE ON CARBON NANOTUBE

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Ciprofloxacin hydrochloride is an important pharmaceutical ingredient. It is used for the treatment of many bacterial infections. It can be found in water sources due to incomplete metabolism in humans or coming from effluents of pharmaceutical factories [1]. In this work, firstly the time for equilibrium of adsorption were found for the adsorption of ciprofloxacin hydrochloride by multiwall carbon nanotube. Later, the effect of initial ciprofloxacin hydrochloride concentrations on adsorption was determined. Equilibrium concentrations of ciprofloxacin hydrochloride after adsorption process was measured by UV spectrophotometer. Linearity studies between concentration and absorbance were done and correlation factors were determined for ciprofloxacin hydrochloride.

Adsorption isotherms of ciprofloxacin hydrochloride for multiwall carbon nanotube using equilibrium concentrations were shown on graphics and determined parameters related to these adsorption isotherms. Adsorption capacity of multiwall carbon nanotube for ciprofloxacin hydrochloride were determined according to the experimental results. Adsorption capacity increased with increasing initial concentration of ciprofloxacin hydrochloride. This study showed that multiwall carbon nanotube absorbent is highly effective adsorbent for the removal of ciprofloxacin from aqueous solutions. Equilibrium data for adsorption of ciprofloxacin hydrochloride on multiwall carbon were best represented by Freundlich isotherm with value of R square 0.9993.

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BIONANOCOMPOSITE APPLICATIONS FOR CHEESE PACKAGING

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Cheese is one of the most important dairy product and it has more than 1000 varieties worldwide. Production of cheese involves many steps and leading to cheese some characteristic properties. Any failure in these steps cause defects in the products. Packaging is one of these important steps in cheese production. Efforts in cheese packaging have been focused on better safety and long shelf life. In recent years researches about innovative food packaging materials gained attention as a result of developments in functional composites and nanocomposites. Improved barrier properties against gases and liquids as well as mechanical strength are accessible with these composites. However, there is an interest in the use of biodegredable and edible materials due to the environmental concerns. Instead of petroleum based compounds bionanocomposites have attracted for cheese packaging. Bionanocomposites based on chitosan, poly viny alcohol and titanium nanoparticles are used for soft white cheese. The use of these packaging materials result decreasing in total bacterial count, yeast-mold and coliform. Chitosan has been investigated for food packaging and due to its mechanical properties chitosan based materials have useful properties in extending the shelf life by reducing microbial growth. Bionanocomposite prepared using chitosan, carboxymethly cellulose and zinc-oxide showed good antimicrobial activity and increased shelf life of soft white cheese while no significant changes was observed in chemical properties. Zinc oxide is metal nanoparticle used for packaging material due to their antimicrobial property to prevent food spoilage. It has high stability and known as non-toxic. Carboxymethyl cellulose also is another biodegradable material which has strong ionic bonds. In this study, bionanocomposite applications in cheese packaging were reviewed.

Keywords: Cheese, packaging, bionanocomposite

THE INFLUENCE OF NANO STRUCTURED TUNGSTEN OXIDE ADDITIVE ON THE IMPEDANCE SPECTRUM OF POLYTHIOPHENE

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Tungsten oxide is a transition metal oxide and it was studied by many researchers due to its chromism, photocatalysis, and sensing abilities [1,2]. However its influence on the electrical properties of polymers was not investigated in details up to the present. From this point of view, this study was devoted to investigate the frequency dependent impedance parameters of the nano sized tungsten oxide doped polythiophene by using impedance spectroscopy. In this work, polythiophene and nano tungsten oxide particles were synthesized by chemical oxidative polymerization and hydrothermal methods, respectively. The nano tungsten oxide contribution in the composite was varying from 0.5 to 2% wt. The average particle size of tungsten oxide particles was determined between 100-300 nm by Scanning Electron Microscopy (SEM). The Fourier Transform Infrared (FTIR) Spectroscpoy was also used to determine changes in the chemical structure of polythiophene due to tungsten oxide doping. The ac measurements were carried out between 296 K and 353K in the frequency range from 10 Hz to 40 MHz. It was shown that the real component of the complex impedance decreased with both increasing tungsten oxide additive concentration and temperature. The equivalent circuit of the samples were analyzed by Nyquist plots. Alternative current conductivity measurements also revealed that the tungsten oxide doping increases the conductivity of the polythiophene considerably. Moreover, it was observed that a temperature dependent conductivity is valid for all samples.

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COMPLEX DIELECTRIC ANALYSIS OF PIn/WO_3 NANO COMPOSITES

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Polyindole (PIn), which is a conductive polymer containing benzene ring linked with the pyrrolitic ring [1], has good thermal stability, high redox activity, and slow degradation rate [2,3]. Due to its remarkable properties, PIn and PIn based nano composites have been utilized in various applications such as battery [4], sensor [5], drug delivery [6] and etc. In this respect, the PIn/WO_3 nano composites have been synthesized for the first time in this study. PIn and nano WO_3 particles were synthesized by chemical oxidative polymerization and hydrothermal methods, respectively. The composites have been prepared by chemical polymerization method. The nano WO_3 particles were doped 0,2, 0,5, 1, 1,5, 2,0 % wt. percentages to PIn. The morphology of the samples was investigated by Scanning Electron Microscopy (SEM). The Fourier Transform Infrared (FTIR) Spectroscopy was also used to determine the chemical structure of the samples. The complex dielectric measurements were performed in the frequency range from 10 Hz to 40 MHz. The dielectric strength values were also been determined. Finally, the effect of WO_3 additive on the ac conductivity of PIn was discussed.

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MECHANICAL PERFORMANCE OF PP/$BiSr_2CaCu_2O_{6.5}$ COMPOSITES

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In recent years polymer-based composites have gained great importance in meeting various needs in different applications. In particular, polymers with improved mechanical properties became very important for electronic devices [1]. From this point of view, discovery of a new dielectric composite materials which have both good dielectric and tensile properties are indispensable for microelectronic devices. In this respect, the mechanical properties of novel polymer/ceramic composites were studied in the present work. As a polymer host and inorganic guest polypropylene (PP) and $BiSr_2CaCu_2O_{6.5}$ ceramic were selected, respectively. The PP and $BiSr_2CaCu_2O_{6.5}$ powders were mixed with different inorganic weight percentages (0.5%, 1%, 3% and 6%) concentrations and the thick film composites were prepared by a hot press technique. The surface morphology and chemical structure of the samples including pure PP were determined by Scanning Electron Microscope (SEM) and Fourier Transform Infrared (FTIR) Spectroscopy method, respectively. The mechanical performance of the samples were discussed in the context of $\sigma = f(\varepsilon)$ stress-strain curves. The tensile parameters such as Young's modulus, tensile strength, percentage strain at break and energy at the break were analyzed. As a result, optimum mechanical properties were observed for 1% ceramic additive. It was determined that relative to pure PP the 1% ceramic contribution rate increases the tensile strength and Young's modulus by 16% and 95%, respectively.

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COMPLEX IMPEDANCE AND AC CONDUCTIVITY ANALYZES OF CERAMIC DOPED POLY (VINIL ALCOHOL) COMPOSITES

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Polymer- inorganic composites lead many unique improvements on the performance of the materials. Poly(vinyl alcohol) (PVA) is a one of the most popular biodegradable and biocompatible polymer with its transparency, high strength, good flexibility, water solubility and good film forming ability. In the light of its processing advantages, PVA takes into account as a good composite material to various host fillers. In the present study, $EuBa_2Ca_2Cu_3O_{9-x}$ ceramic material (coded as Eu-1223), was chosen as a filler for PVA film. The Eu-1223 is a novel ceramic material which was synthesized by our research group in our previous studies [1,2]. The influence of Eu-1223 ceramic additive on the complex impedance spectra of PVA polymer was investigated. PVA/Eu-1223 polymer-ceramic thick film composites were prepared by solution casting method with different ceramic contents varying from 1% to 5%. The impedance and dielectric properties of the samples recorded at room temperature indicated a space charge polarization in the material regardless of the doping concentration. The Nyquist and phase angle plots defined the grain and grain boundary properties along with the ideal capacitor ability of the composites. The ac conductivity of pure PVA decreased with increasing Eu-1223 additive. The frequency dependent ac conductivity analyses of the samples bringed out that, different conduction mechanism are dominant for the low, mid and high frequency regions. According to the results, it is concluded that 5% Eu-1223 added PVA thick film may be suggested as a low dielectric loss dielectric material for supercapacitor applications.

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TEMPERATURE DEPENDENT MAGNETIZATION AND DIELECTRIC PROPERTIES OF COPPER FERRITE/COPPER OXIDE NANO COMPOSITES

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Ferrites have spinel structured forms in which metal ion arrangements strongly affect the magnetic and electrical properties of the material. Low cost and eco-friendly copper ferrite ($CuFe_2O_4$) is one of the most important inverse spinel form of the ferrite materials. CuO is also a well-known p-type semiconductor which is a suitable dopant material for the copper ferrite based device applications such as sensors or supercapacitors due to its chemical stability. In this study, CuO doped copper nano ferrite composites have been synthesized by a two- steps chemical co-precipitation and sol-gel methods. The structural analyzes of the composites are performed by the Scanning Electron Microscope (SEM) and Fourier Transformed Infrared (FTIR) techniques. The temperature dependencies of the magnetization of the samples have been carried out using a SQUID (Superconducting Quantum Interference Device) magnetometer in zero-field-cooled (ZFC) and field-cooled (FC) modes in 50 Oe. Dielectric measurements have been performed by NOVO Control Broadband Dielectric/Impedance analyzers with Quatro Cryosystem between 10Hz–40MHz within the temperature interval of 296K-433K. The frequency and temperature dependent analyzes of the real and imaginary components of complex impedance and dielectric functions have been examined in details in order to specify the dominant conduction mechanisms and electrical response of the pure copper ferrite and its nano composites.

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CHEMICAL TREATMENT AND CHARACTERIZATION OF (211)B GaAs WAFER SURFACES

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Substrate surface plays an important role to achieve high performance infrared devices and high quality film layers. Despite 'epiready' wafers can be easily found on the market, most of them have defects and contaminations due to fabrication processes. Defects and contaminations on wafers have deleterious effects on high quality thin film growth. To overcome such problems, various chemical treatments should be implemented prior to thin film growth. Generally, a wafer-cleaning process consists of dry and wet cleaning techniques. Wet cleaning techniques of III-V semiconductors, several solution are used such as; Br_2/CH_3OH [1], $H_2O_2/NH_4OH/H_2O$ [2], $H_2SO_4/H_2O_2/H_2O$ [3] and $H_2SO_4/H_2O_2/HCl$ [4]. In this study, to find out the effect of wet chemical cleaning process on undoped DS polished epi-ready 625±25 µm thick (211)B GaAs wafers, piranha solution-based ($H_2SO_4/H_2O_2/H_2O$) wet chemical etching technique was performed with varying ratios and implementation times. Despite the fact that wet chemical etching process removes the contaminations from the wafer surface, GaAs surfaces form a layer of native oxygen atoms on the surfaces in a short time due to interacting with the atmospheric oxygen. In addition, to evaluate the quality of epiready GaAs (211)B wafers and to remove the native oxide from the layer, diluted hyrofluoric acid (HF) was performed on GaAs wafer pieces. After these chemical treatments, the surfaces of GaAs wafers were investigated by Atomic Force Miscroscopy (AFM) and Scanning Electron Microscopy (SEM). Energy Dispersive X-ray Spectroscopy (EDX) were used to assess the chemical composition of the surface. The Raman active modes of GaAs, As-related defect phonon modes and Ga2O3 and As2O3 species were studied with Raman scattering technique. The distribution of As-related defect phonon modes and Ga2O3 and As2O3 species were observed by a two-dimensional (x, y) Raman mapping technique.

Keywords: Chemical Etching, Piranha Solution, Oxide Removal, Gallium Arsenide, Raman mapping

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SYNTHESIS, CHARACTERIZATION AND ELECTROCHEMICAL PROPERTIES OF POLY (PHENOXY-IMINE)S CONTAINING NAPHTHALENE UNIT

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The oxidative polymerization of phenoxy naphthalene derivatives constitutes a class of interesting research topic [1]. Polyphenols or phenoxy naphthalene have been received much more attention because of their thermal and mechanical properties [2]. Polyphenols or poly (phenoxy naphthalene) are used to prepare composites, graphite materials, epoxy polymers and materials resistable to high temperature. Thermogravimetric analysis (TGA) has been widely used to investigate the thermal stability characteristic of various substances, including polymer pyrolysis [3].

Schiff base of phenoxy naphthalene were synthesized by condensation reaction of 8-amino-2-naphthol with 4-hydrxybenzaldehyde. Then, the polymers of phenoxy naphthalene containing imine bonding and 8-amino-2-naphthol were synthesized via oxidative polycondensation by sodium hypochlorite and H_2O_2 as oxidant [1]. The solubility tests of Schiff bases polymer and poly (8-amino-2-naphthol) were performed in acetone, THF, chloroform, acetonitrile, methanol, ethyl acetate, n-hexane and DMSO.

The structures of synthesized compounds were confirmed by FT-IR, UV-vis, ^{1}H-NMR, ^{13}C-NMR measurements. In addition, thermal properties of Schiff bases and poly (phenoxy naphthalene)s were determined by TGA-DTG, DTA and DSC techniques. Photoluminescence properties of the synthesized compounds were determined in solution forms in DMF. The number-average molecular weight (Mn), weight average molecular weight (Mw) and polydispersity index (PDI) values of the synthesized compounds were determined by the gel permeation chromatography.

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SYNTHESIS, CHARACTERIZATION AND CATALYTIC ACTIVITY OF Ru (II) COMPLEX OF CYCLOTRIPHOSPHAZENE LIGAND CONTAINING CHLOROPYRIDINE

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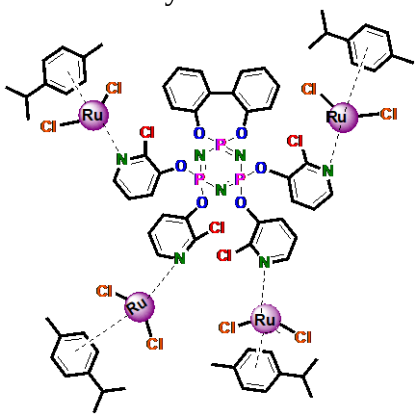
Phosphazenes are chemical compounds that bear -N=PX_2- group. In other words, phosphazenes are the compounds in which a phosphorus atom is covalently connected to a nitrogen atom with a double bond and three other atoms by single bonds. The cyclic and linear compounds formed by the repeating sequence of this group in the molecule constitute one of the most interesting inorganic compound classes.

In recent years, cyclophosphazenes have been frequently used as ligands in coordination and organometallic chemistry. These compounds might have different characteristics depending on whether the bound group is organic, inorganic or organometallic. One of these characteristics is the ability of some metal complexes of these compounds to act as catalyst systems [1]. The demand to obtain selective products from organic reactions in high yield, to have cheap and few-step reactions, and the formation of byproducts and toxic products at a minimum level has increased the affinity for catalyst systems in recent years.

In this study, we have synthesized a novel cyclotriphosphazene ligand bearing 2-chloro- 3-hydroxy pyridine moieties and its corresponding Ru(II) complex. Their structures were characterized by FT-IR, ^{1}H-NMR, ^{31}P-NMR spectroscopic data. Ru(II) complex (2) was used as catalyst for catalytic transfer hydrogenation of p-substituted acetophenone derivatives in the presence of KOH. As a result, Ru(II) complexshowed efficient catalytic activity towards transfer hydrogenation of acetophenone derivatives, especially bearing electron withdrawing substituents on the para-position of the aryl ring.



Acknowledgment: This study is supported by a grant (112T584) from Scientific and Technical Research Council ofTurkey (TUBITAK).

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SYNTHESIS AND CHARACTERIZATION OF CYCLOPHOSPHAZENE DERIVATIVE CONTAINING CARBAZOLE

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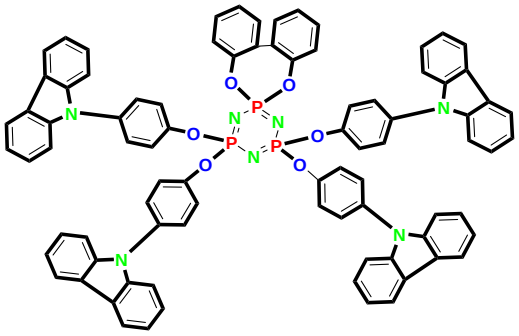
Phosphazenes are chemical compounds containing the group -N=PX_2-. In other words, phosphazenes are compounds in which the phosphorus atom is covalently bound to the nitrogen atom with double and to the other three atoms with single bonds. Phosphazenes come in various forms resulting from the nucleophilic substitution reaction of the chlorine atoms on the phosphorus atom with various groups [1]. Some important phosphazene compounds are used in industry, military and medical fields. Phosphazene derivatives have many physical and biological properties [2]. They not only have applications in liquid crystals, flame resistant materials, and electrolytic rechargeable batteries but also have very strong antimicrobial, antibacterial and anti-tumor activities.

In this study, firstly cyclophosphazene compound containing 2,2'-dihydroxybiphenyl group which is more resistant to thermal decomposition and hydrolysis than hexachlorocyclotriphosphazene will be synthesized and the resulting compound obtained by reaction with carbazole will be analyzed by IR, ^{1}H-NMR, ^{13}C-NMR, ^{31}P-NMR spectrum data. Finally, the cytotoxic activities of this compound on various cancer cells will be determined.



*This study is supported by a grant (117Z742) from Scientific and Technical Research Council ofTurkey (TUBITAK).

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SOL-GEL-PROCESSED DMSO-DOPED PEDOT: PSS AS HOLE TRANSPORT LAYER IN INVERTED TYPE PEROVSKITE SOLAR CELLS

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Perovskite is composed of organic / inorganic components with ABX_3 structure. Among the perovskites of ABX_3 structure those interesting in terms of photovoltaics are large cations (usually methyl ammonium ion (CH_3NH_3)), small cation B (usually lead (Pb)) and X anion halogen ion (usually bromine and chlorine are also used). The first perovskite solar cells were prepared by replacing the dye layer of the dye-sensitized solar cell with methyl ammonium lead iodide ($CH_3NH_3PbI_3$) and using liquid electrolyte and the efficiency was around 7 % (Im J.-H et al 2011). Recently, perovskite solar cells comprising of formamidinium lead iodide ($FAPbI_3$) instead of methylammonium lead iodide ($MAPBI_3$), exceeded 20% of efficiency. In less than 10 years, their efficiencies became approximately 23 %.

In this study, We have investigated inverted type Perovskite solar cell using ITO/PEDOT: PSS/Perovskite/Al (or Ag) device configuration. To improve conductivity of PEDOT: PSS, DMSO has been added with different concentration. Aim of the this study has been examined the effect of conductivity of PEDOT: PSS on inverted type Perovskite solar cell. We improved the power conversion efficiency of device containing DMSO additive PEDOT: PSS compare with non-additive reference Perovskite solar cell.

CYANO CONTAINING SMALL ACCEPTOR MOLECULES FOR INVERTED TYPE ORGANIC SOLAR CELLS

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Recently, organic solar cell research have attracted a worldwide attention due to the several advantages such as low cost, flexibility and possibility of easy production techniques. Efficiencies over 13 % has been achieved. However, there is still alot to do from both research and industrial points of view for a successful commercialization.

Variety of molecules, polymers and fullerenes has been investigated for organic solar cell research. Among these molecules, fullerenes are widely used as electron acceptors. One of the most investigated acceptors is a fullerene derivative of [6,6]-phenyl-C61butyric acid methyl ester (PCBM). Although this fullerene derivative has been widely investigated, it's expensive and difficult synthesis route and low visible absorption profile and the highly reactive singlet oxygen due to excited fullerene states makes it disadvantageous. Therefore, there is an urgent need and high interest to investigate novel acceptors.

In this study, We have investigated inverted type organic solar cell with ITO/ZnO/Active layer/MoO3/ Ag device configuration. In active layer, non-fullerene soluble two small molecules considered as acceptor materials and AnE-PVstat containing anthracene has been used as donor material. There have been many studies previously about AnE-PVstat with fullerene type acceptors materials. On the other hand, in this study AnE-PVstat has been used as donor material with fullerene free acceptor materials for the first time.

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FULLERENE-FREE INVERTED TYPE ORGANIC SOLAR CELLS

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During the last two decades, organic materials applications have attracted attention thanks to their easy producibility, flexibility, low cost and easily adjustable band gaps properties. Organic solar cells contain two organic materials which is called donor and acceptor. Fullerene derivatives materials have still good electron acceptors ($PC_{61}BM$ and $PC_{71}BM$) due to their superior charge transporting properties. However, these acceptor materials suffers from some shortcomings including difficult synthesis, high production cost, their poor absorption of solar spectrum and difficult adjustable energy levels. To overcome above mentioned problems some scientific groups have developed novel non-fullerene acceptor materials. During the last few years power conversion efficiency (PCE) have been achieved up to 12% in the fullerene free Organic solar cells.

In this study, we have investigated four different buffer layers in the inverted type organic solar cell with ITO/Buffer layer/Active layer/MoO3/ Ag device configuration. In buffer layers, Polyethylenimine, 80% ethoxylated solution (PEIE) has been used especially to reduce of work function of ITO and ZnO. Thanks to surface modification of ITO and ZnO charge amount on the contact might be increased. In active layer FTTB which is non-fullerene material were used as acceptor with P3HT as donor material for the first time. We have achieved PCE up to 2 %.

EVALUATION OF NEW ALKYNE-BASED COMPOUNDS FOR OPTOELECTRONIC PROPERTIES

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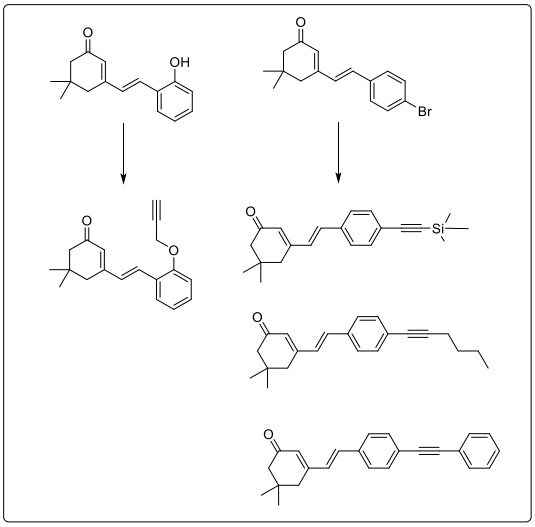
The sensors, transistors, diodes, and transducers can memeber of organic electronics, which is having potential for the commercialization. Alkyne is amongst the most proficient key-block coumpound with many, and it plays an essential role for the polymerization and coupling reagent in the organic electronics [1].



In this study, a series of alkyne derivatives have been designed and synthesized. All synthesized compounds were characterized by ^{1}H-NMR, ^{13}C NMR, and MS. Their optoelectronic activities were evaluated cyclic voltametry, fluorescence quantum yield, solvatochromic effect with the establishment of their structure-activity relationships. This study was performed within the scope of the project of FMB-BAP-17-0256 supported by Amasya University.

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POSTER PRESENTATION

INVESTIGATION OF SOLID STATE CONDUCTIVITIES OF NEW TETRAZOLE-Pt (II) COMPLEXES

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In recent years, with the appearance of organ transplantation and treatments of cancers, tremendous growth of fungal infections has been inducing mortality in patients. Not only fungal infections, but also other infections cause death. So, new drugs are needed to prevent infection.Tetrazoles possess various biological activities, [1]. The tetrazole compounds including transition metal ions have been the focus of recent research interest focused on their use in medicinal chemistry. Pt (II) complexes are commonly used as antifungal and anticancer agent [2].

In this study, some new tetrazole-Pt (II) compounds have been synthesized (figure 1). After that the structures of the synthesized compounds have been determined by spectroscopic methods such as elemental analysis and FT-IR. Solid state conductivities of the synthesized substances were using the four-probe technique on a compressed pellet at room temperature.

The conductivities of the Platinium (II) complexes are higher than the others. This may be attributed to the coordinated water in these complexes. H_2O may play a role as some sort of carrier hopping site [3].

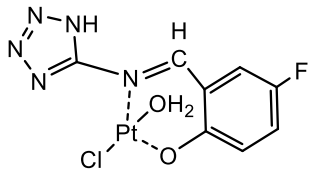

Figure 1. Suggesiton structure of tetrazole-Pt (II) complex

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POSTER PRESENTATION

ON THE ELECTRICAL PROPERTIES OF Ag/GRAPHENE OXIDE/p-Si STRUCTURES AT ROOM TEMPERATURE

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In this study, we investigated the current-voltage (*I-V*) and capacitance–voltage (*C–V*) characteristics of Ag/p-type Si structure at the room temperatures. The main parameters such as ideality factors (*n*), barrier heights (Φ_{b0}), series resistances (R_S), and the density of interface states (N_{SS}) have been investigated using current–voltage measurements at room temperature. The barrier height, ideality factor and series resistance of the Ag/GO/*p*-Si Schottky heterojunction have been also determined using different methods. The presence of the interface state densities (N_{SS}) are also evidenced as a peak in the capacitance, conductance and series resistance –frequency characteristics. Thus, the energy distribution of interface states density (N_{SS}) as a function of energy distribution (E_{SS}-E_V) were determined from the forward bias current–voltage (*I-V*) characteristics. The experimental results showed that the diode with GO interfacial layer can be used as a photodiode or in optoelectronic circuits.

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N-ALKYLBENZIMIDAZOLE COMPOUNDS AND THEIR METAL COMPLEXES: PHOTOPHYSICAL AND LIQUID CRYSTAL PROPERTIES

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Imidazole compounds are special compounds due to their prominent role in biological chemistry [1]. These compounds has been extensively studied in in many applications includes their use as liquid crystal complexes, polymers and organic ligands as well as biological applications. Some benzimidazoles have antiviral, antibacterial, antifungal, antimalarial, and anthelmintic activities. Benzimidazole, a class of imidazole, is a hetero-bicyclic aromatic compound which contains the fusion of benzene and imidazole rings. Several benzimidazole derivatives have been synthesized and liquid crystalline properties of these compounds were studied [2]. In this work, N-alkyl 2,6-bis(2-benzimidazolyl)pyridine derivatives were prepared and characterized by the spectroscopic and analytical methods. Molecular structures of the compounds were also determined by X-ray diffraction studies. Absorption and emission properties of the compounds were studied. Finally, liquid crystal properties of the compounds were investigated by POM (polarized optical microscope) and DSC (differential scanning calorimetry).

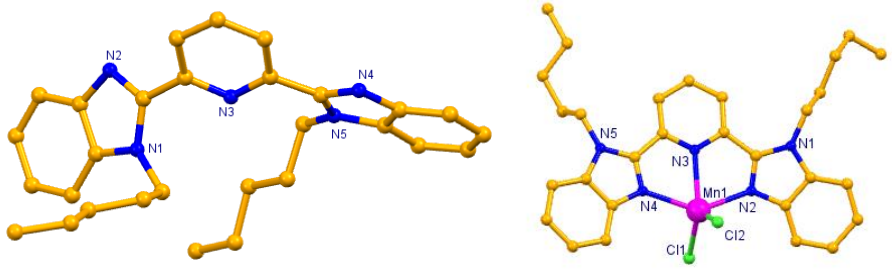

Figure: X-ray structure of N-pentyl- 2,6-bis (2-benzimidazolyl)pyridine (right) and its Mn (II) complex (left).

Acknowledgements: Authors thank to Kahramanmaras Sutcu Imam University Scientific research project coordination unit (BAP project number: 2018/3-26 M) for financial support.

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SYNTHESIS OF BENZIMIDAZOLE-BASED COMPOUNDS AND THEIR METAL COMPLEXES: LIQUID CRYSTAL PROPERTIES

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Benzimidazoles are an important class of heterocyclic and they have used in many applications includes as liquid crystal complexes, polymers and organic ligands [1]. Several compounds and complexes containing benzimidazoles have been synthesized and liquid crystalline properties of these compounds were studied [2]. Liquid crystalline materials containing metal ions are known as metallomesogens. The combination of the properties of organic liquid crystals and of transition-metal ions can produce new materials and these materials exhibit unique assembly structures, and unique optical, magnetic and electronic properties [3]. In this work, N-alkyl 2,6-bis(2-benzimidazolyl)pyridine derivatives and their complexes were prepared and characterized by the spectroscopic and analytical methods. Molecular structures of the compounds were also determined by X-ray diffraction studies. Liquid crystal properties of the compounds were investigated by POM (polarized optical microscope) and DSC (differential scanning calorimetry).

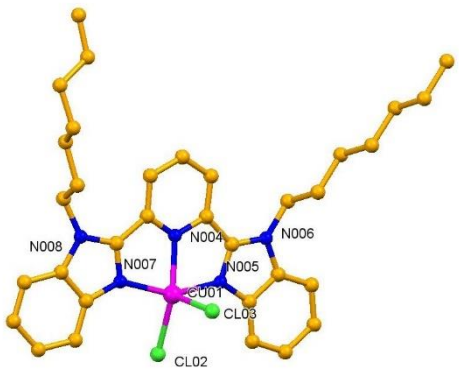

Figure: X-ray structure of N-alkyl- 2,6-bis(2-benzimidazolyl)pyridine Cu(II) complex.

Acknowledgements: Authors thank to Kahramanmaras Sutcu Imam University Scientific research project coordination unit (BAP project number: 2018/3-26 M) for financial support.

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SYNTHESIS AND CHARACTERIZATION OF NOVEL BIO-BASED HIGH PERFORMANCE POLYBENZOXAZINE FROM GALLIC ACID

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Commonly used thermosetting resin systems are namely phenolics, epoxies, bismaleimides, cyanate esters, vinyl esters, and polyimides. Among them, benzoxazine chemistry has recently attracted much interest. Polybenzoxazines as a class of polyphenolic thermosets formed by ring-opening polymerization of the 1,3-benzoxazines without using any catalyst. These thermosetting materials attract a great interest in diverse scientific and industrial areas due to their superior properties. Most of the chemicals used for the synthesis of benzoxazine are based on petroleum resources, which is not easily renewable. The environmental and cost concerns of fossil fuels necessitated to investigate alternative raw materials. The acquisition of green polymers from renewable sources has led to great interest in the last few years. Gallic acid is a phenolic acid present in grapes and in the leaves of many plants. Gallic acid esters, such as tannins, catechin gallates and aliphatic gallates are potent antioxidants in vitro. In this work, a bio-based benzoxazine monomer and polymers have been successfully synthesized from a renewable organic resources with a free phenolic hydroxyl between two oxazine rings attaching to the same benzene. The structures of the products were supported by FT-IR, ^{1}H NMR, DSC, TGA and MALDI-TOF spectra, which showed the existence of a reactive benzoxazine ring.

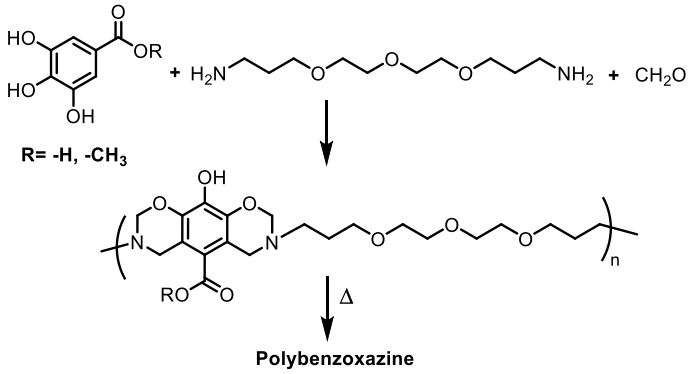

Figure 1. Synthesis of bio-based main-chain polybenzoxazine.

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ANTIMICROBIAL AND ANTIMUTAGENIC ACTIVITY OF POLYMERIC MICROSPHERE INCLUDING AZOMETHINE

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There is an interest in azomethines because of the presence of both hard nitrogen or oxygen and soft sulphur donor atoms in the backbones of these ligands, some of them have been exhibit interesting physical and chemical properties and potentially useful biological activities [1]. Antimutagens is a complement DNA repair systems. To minimize the detrimental genotoxic effects of mutagens caused by exposure to free radicals, chemical compounds, air pollutants or metabolic processes, the search of new antimutagens is important [2]. The purpose of the study was to examine the antimicrobial and antigenotoxic properties of polymeric microsphere containing imine.

Recently, the synthesis of polymeric microsphere including azomethine (L_{Me}) was reported by us [3]. In this study, the compound (L_{Me}) was examined by the well-diffusion method against some pathogenic strains *(Listeria monocytogenes 4b, Salmonellatyphi H, Bacillus cereus sp., Staphylococcus epidermis, Micrococcus luteus, Escherichia coli, Staphylococcus aureus, Brucella abortus, Proteus vulgaris, and Klebsiella pneumonia)* and *yeast Candida albicans*. It was also compared with five commercial antibiotics. Furthermore, (L_{Me}) was investigated against sodium azide in human lymphocyte cells by micronuclei and sister chromatid exchange tests for antimutagenic properties.

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POSTER PRESENTATION

ELECTROCHROMIC PROPERTIES OF ELECTROCHEMICALLY SYNTHESIZED POLYANILINE

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Polyaniline (PANI) conductive polymer was deposited by electrochemical deposition method on indium tin oxide (ITO) coated glass surface. The aqueous solution of PANI includes 0.25M aniline and 0.5M hydrochloric acid (HCl). After deposition of films, electrochromic behaviors were investigated by cyclic voltammetry in 0.1M H_2SO_4 solution, scanned between -0.5V and 1.1V. In virtue of the measuremets, electrochromic properties and stability, and optical properties were studied.

ORGANIC LIGHT EMITTING DIODES APPLICATION OF GREEN EMMISIVE POLYFLUORENE DERIVATIVES

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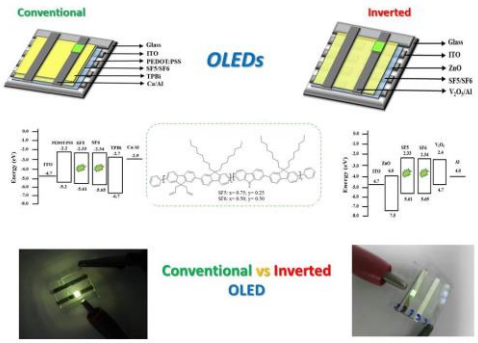
One of the most common conjugated polymers research areas are organic light emitting diodes (OLEDs). Polyfluorene and its derivatives are most popular research subject for blue OLEDs, Owing to fluorenon units consisting of electron attracting Oxygen atom, green emissive polymers can be obtained. In this study, Fluorene based emmisive electroactive polymers were synthesized by Suzuki coupling reaction. Stuructural characterizations were carried out by using H NMR and GPC. Their photo-physical, electrochemical and thermal properties were determined by UV–Vis and PL spectroscopies and cyclic-voltammetry (CV), respectively. Effect of fluorenone moiety on the main chain of the polyfluorene with allyl subunit was investigated. Firstly, optimization study were realized to obtain optimum conditions for OLED device performances. Thus, concentration (4, 6, 8 and 10 mg/ml), annealing temperature (RT, 60, 120, 150 and 200 °C) and spin deposition (1000, 2000 and 3000 rpm) values were studied in order to investigate electroluminescence (EL) characteristics and device performances. Further, annealing treatment were optimized for light output characteristics of the fabricated OLEDs. This study revealed the importance of charge transport feature of the synthesized polyfluorene derivatives in electroluminescent devices with variant architecture.



Keywords: Organic Light-Emitting Diode (OLEDs), inverted sturucture, polyfluorene,

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POLYCYCLIC AROMATIC HYDROCARBONS (PAHS) CONTAMINATION IN THE SURFACE SEDIMENTS OF SOUTHERN WEST BLACK SEA AND NORTHERN EAST AEGEAN SEA, TURKEY

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Polycyclic aromatic hydrocarbons (PAHs), are known as widespread contaminants that are carcinogenic and mutagenic in marine environment. They result from the incomplete combustion of organic matter, especially fossil fuels (pyrolytic origin), from the discharge of petroleum and its products (petrogenic origin) and from the post-depositional transformation of biogenic precedents (diagenetic origin). Hydrocarbons may enter the marine environment through from land based sources, i.e. sewage disposal, rivers, coastal industries, refineries, oil storage facilities and ocean based discharges, i.e. oil spills from ships, offshore platforms and pipelines [1]. Sediment usually contains higher concentrations of contaminants than those present in the water column.

PAHs were investigated in surface sediments from Southern West of the Black Sea and Northern East of Aegean Sea in 2016 autumn and 2017 spring seasons. Total polycyclic aromatic hydrocarbons (TPAH) values ranged from 120 to 2912 ng/g (dw). According to Baumard et al. [2], PAH contents can be described as low, moderate, high and very high when TPAH concentrations are 0–100, 100–1000, 1000–5000 and > 5000 ng/g, respectively. According to this classification, in this study PAHs ranged from a relatively moderate to high PAHs pollution. The most polluted sediments were collected from the regions affected by shipping such as Seddülbahir and Riva being located at the entrance and the exit of the TSS. The high values at the exit of the TSS indicate that the pollution of the Marmara Sea is added to the pollution load of the Black Sea. Moreover, origins of PAHs were determined using the ratios of PAH congeners. The main origins of PAHs were found as both pyrolytic and petrogenic at most stations.

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POSTER PRESENTATION

APPLICATIONS OF NANOMATERIALS FOR THE DIAGNOSIS OF CANCER

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Silver oxide nanoparticles (AgO NPs) are wonderful material and having great potential towards biomedical applications. Silver oxide nanoparticle (AgO NPs) were synthesized via Chemical Aqueous method and characterized by applying manifold available techniques. X-ray diffraction (XRD) was used to study the structural property of nanoparticle crystals and the surface morphology of synthesized nanoparticles was studied by scanning electron microscope (SEM). Phototoxic and cytotoxic effects of grown particles were examined by conduction various relevant experimental techniques on hepatocellular (HepG2 Cell line) model. The obtained results were verified by applying polynomial fit which confirmed the goodness of fit. AgO NPs have unique biointeraction characteristics and physicochemical properties such as anticancer and antibacterial agent. This study will be helpful particularly for real treatment of malignant/pre-malignant conditions.