ICCESEN-2023

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ABSTRACT BOOK

Editors:

Prof.Dr. İskender AKKURT
Dr. Hakan AKYILDIRIM
Dr. Kadir GÜNOĞLU

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SCIENTIFIC PROGRAMME FOR ICCESEN-2023

ORAL PRESENTATIONS
28 October 2023-Saturday
ROOM-1

10.00-11.00	**Opening : Prof. Dr. Iskender AKKURT** (Chair of ICCESEN-2023)—Suleyman Demirel University, Isparta / TURKEY
	Session Chair : Dr. Feride KULALI-- Uskudar University, Istanbul / TURKEY
	Invited Speaker 1: Prof. Dr. Fisnik Aliaj —Department of Physics, University of Prishtina, Prishtina, Kosovo "Prediction of excess thermodynamic properties of quaternary liquid systems from data of their lower order systems " **Invited Speaker 2:** Prof.Dr. Madjid FATHI – Dept. of EECS University of Siegen, GERMANY "Artificial Intelligent (AI) comprehend solution in Agra production- Foodservice" **Invited Speaker 3:** Dr. Manju D. CHOUDHARY – NISCAIR-INDIA "Chemical Methods in Environmental Science"
11.00-11.30	**Group Photo- BREAK**

28 October 2023-Saturday

ROOM-1			
	Session Chair : Dr. Feride KULALI-- Uskudar University, Istanbul / TURKEY		
11.30-12.30	399	Salim BELGHIT, Omar ALLAOUI, Sami Zidelmel	Evaluation of cyclic stress damage to the mechanism of rail steels on the curved lines, using the soldworks software.
	411	Amel KAIBI, Abderrahim GUITTOUM, Messaoud. HEMMOUS, D. MARTINEZ-BLANCO, P. GORRIA, J. A. BLANCO , MOUHAMED KECHOUANE	The effect of Si content on the physical properties of nanostructured (Ni75Fe25)100-xSix alloy elaborated by mechanical alloying
	92	Kenza Zaibak, Nora Nait Bouda and Fawzia Mekideche-Chafa	Applications of Wavelet Transform for Analysis vibratory regime in series RLC circuit
12.30-14.00	**LUNCH---BREAK**		
14.00-16.00	104	Mouachi Raja, Remmach Hassnae, Gharnati Fatima and Raoufi Mustapha	Security challenges in Critical Smart grid infrastructure
	171	Mr. Etkin Can and Dr. Metehan Atagür	An investigation of the effect of chromium oxide additives on zinc phosphating of steel fasteners
	172	Etkin Can and Metehan Atagür	Development of innovative fluoropolymer-based coatings to improve the surface properties of fasteners
	18	Ferim Gashi, Ibrahim Ramadani, Edon Shemsedini and Shkumbin Lushaj	Analysis of the location of industrial facilities in relation to the urban area (Case study: City of Gjilan-Kosovo)
	173	Dr. Metehan Atagür and Mr. Etkin Can	Investigation of the use of precious metal oxides in galvanic coating wastes as an innovative anti-corrosion filler by recycling
	174	Dr. Metehan Atagür and Mr. Etkin Can	Enhancing the electrical conductivity by graphene growing on nickel electroplated bolts by chemical vapor deposition (CVD) technique
	177	Meral Çoban Uğurdan and Ayşe Aytaç	Investıgatıon of plasma effect on the propertıes of paper contaınıng dıfferent cellulose types
	27	Zarife Bajraktari-Gashi and Izet Ibrahimi	Research of the possibilities of reducing the quantity of CO2 in the premises of the E&E Foundry in Gjakovo
	38	Naim Syla, Fisnik Aliaj, Bashkim Dalipi, Arbër Zeqiraj and Dhuratë Syla-Hasani	Fe modeling of shock waves
16.00-16.15	**BREAK**		
	385	Arslan SAY, Taina AVRAMESCU, Daniela NEAGOE, Yanislav ZHELEV, Joanna KOMOREK	Digital Trainings for Acquiring Medical Skills in the Treatment of Post-COVID or Long-Term Covid Symptoms
	384	Arslan SAY, Taina AVRAMESCU, Daniela NEAGOE, Yanislav ZHELEV, Joanna KOMOREK	Review of the Current Status of Post-Covid Syndrome
	53	Karima Bouakaz, Amel Youcefi and Abdessamad Abada	Real Time Ultrasoft transverse Photons Self Energy at Next to-leading order in Hot Scalar QED

16.15-18.00	54	Besire Cena and Nazmi Hasi	Handling of radioactive waste from the use of radionuclides in medicine in University Clinical Center of Kosovo
	66	Samir Chadli, Billel Bengherbia, Abdelhafid Tobbal, Sid Ahmed Lachenani, Fouad Tchoketch Kebir and Abderrahmane Kerouche	Design and implementation of an Edge AI solution for bearing monitoring and fault diagnosis in centrifugal pumps
	112	Fahima Fares, Nadir Bouarissa, Nour El Houda Fares and Fadila Mezrag	Energy gaps and optical properties for the ternary semiconductor alloys InxGa1-xN
	71	Melia Guessoum, Farida Bouzidi and Sorya Nekkaa	Copper intercalated montmorillonite reinforced polypropylene/ poly(lactic acid) (PP/PLA) blend nanocomposite : study of environmental properties and biocidal activity
	77	Mimoza Kovaci Azemi and Zarife Bajraktari Gashi	Optimal conditions for Continuous Hot-Dip Galvanizing steel sheet
	91	Mohammed Oubelkacem Azzoug, Ahmed Amrouche, Farid Belmnaouer, Brahim Mahfoud and Tarek Messai	Development and characterization of new cathode materials for hydrogen production by water electrolysis
	409	Hüsamettin URUNVEREN, Ahmet BEYCIOGLU, Emriye Çınar RESULOGULLARI	The effect of ms modulus and curıng temperature on workabılıty and strength ın geopolymer mortars
	410	Feride Kulalı Özdek, Yuşa Gürsoy	Determınatıon of radon actıvıty levels of tap and sprıng water ın the anatolıan sıde of ıstanbul

	ROOM-2		
11.30-12.30	**Session Chair : Dr. Hayat ARBOUZ**– University of Blida1-ALGERIA		
	377	Hayat Arbouz	Numerical Study of Epitaxial Misfit Strain Effect on Bandgap fluctuation of the Absorber Material Perovskite CsSn(I1-xBrx)3, and its impact on Photovoltaic Performance of the CsSn(I1-xBrx)3 /SnO2 Solar Cell based Structure
	267	Khalid Mohammad JABER, Mohammed Lafi, Ahmad AA Alkhatib, Amani Khamis AbedAlghafer, Mohammad Abdul Jawad, Amal Qassed Ahmad	A Comparative Study for Virtual Personal Assistants (VPA) and State-of-the-Art Speech Recognition Technology
	203	Serkan Biyik	Synthesis and Characterization of Y2O3-doped Nanocrystalline Ag-ZnO Electrical Contact Material via Ball Milling
	202	Serkan Biyik	Effect of Matrix Particle Size on the Mechanical Alloying Behavior of Tungsten Carbide Reinforced Copper Based Composite Powder
	222	A.Nekrouf, S.Youcefi	Impacts on the modification of a two-blade mobile on the agitation of newtonian fluids
	253	Afrim Osmani, Muharrem Zabeli, Bastri Zeka	Recycling of lead from spent batteries in the Trepça complex in Mitrovica,Kosovo
	181	Barış Gökdemir, Kutlay Sever and Metehan Atagür	A Study on Production of Polypropylene Matrix Biocomposite Using Sugar Beet Pulp Particles
12.30-14.00	**LUNCH---BREAK**		
14.00-16.00	102	Mouhoub Birane	Enhancing Efficiency Improvement of Photovoltaic Systems and optimal Energy Management of PV-Battery for Renewable Energy Systems.
	103	Izet Ibrahimi, Zarife Bajraktari Gashi, Nderim Tahiri and Skender Nikaj	Research of opportunıtıes for the ıntensıfıcatıon of the cast ıron productıon process ın the cupola furnace
	105	Dr. Magraoui Rabah and Prof. Ouali Mohammed	Contribution to conditional maintenance by vibration analysis of rotating machines Mechanical failures and proposed solutions

	115	Tarek Khoualdİa, Zoubir Chellİ and Sofiane Boukharİ	Application of deep neural network for diagnosis of roller bearing faults in induction motor
	117	Chelli Zoubir, Khoualdia Tarek and Boukhari Soufiane	Contribution to the study of a photovoltaic pumping chain in the Tiffech region, Souk ahras, Algeria
	122	Djamel Ouadjaout	Strategy for improving the performance characteristics of Multicrystalline Silicon ingots
	123	Rezki Amara, Mokhtar Nebab, Ait Atmane Hassen and Riadh Bennai	Interfacial Stress Analysis in FRP Reinforced RC Beams Using ANN Method
	130	Sabiha Anas Boussaa	Recovering of Pure Silicon from Damaged Crystalline Silicon Cells
	139	Burim Kamishi	On Symplectic Form of Physical Systems with Symmetry
16.00-16.15	**BREAK**		
16.15-18.00	140	Allaoui Omar, Barkat Med Redouane, Zidelmel Sami and Keddam Mourad	Effect of the nature and the proportion of the activator on the borides layers produced on C35 steel by the powder technique
	150	**Arbër Zeqiraj,** Altin Gjevori, Artan Llozana, Naim Syla and Fisnik Aliaj	Densities and sound speeds of ternary mixtures 1-butanol + cyclohexane + ethylbenzene and their binary subsystems at a temperature of 298.15 K under atmospheric pressure
	305	Ezgi Yıldız ATEŞ, Hüseyin Ali YALIM, Mücteba UYSAL	Determination of Radiation Absorption Properties of Some Concretes Containing Heavy Aggregate and Ulexite
	300	Ali İhsan ÇETİN, Ali Hakan BÜYÜKLÜ	Revolutionizing K-Nearest Neighbor Distance Measurements for Enhanced Credit Scoring
	261	Şemsettin KILINÇARSLAN, Yasemin ŞİMŞEK TÜRKER	Investigation of the Effect of Anatomical Properties on the Technological Properties of Wood Material
	262	Şemsettin KILINÇARSLAN, Nanh Radia FAISAL, Metin DAVRAZ	Investigation of physico-mechanical properties of artificial marble produced with magnesium oxychloride cement
	234	Mohamed MAOUDJ, Djoudi BOUHAFS	Application of Injection-Dependent Lifetime Spectroscopy for the determination of recombination activity of interstitial Iron in silicon wafers
	208	Yasin Ozdemir, Kutlay Sever, Metehan Atagur and Ibrahim Sen	Investigation of Mechanical and Thermal Properties of Pumice Powder Filled Polypropylene Composites
	207	Yasin Ozdemir, Kutlay Sever, Metehan Atagur, Ibrahim Sen and Murat Eroglu	Evaluation of the nucleating effect of pumice on the mechanical and thermal properties of polypropylene

	ROOM-3		
11.30-12.30	**Session Chair : Dr. Sabiha Anas-** CRTSE / ALGERIA		
	19	Dr. Tahar Boukra, Bilel Ayachi and Yassine Bensafia	bearıng remaınıng useful lıfe predıctıon : baselıne study
	22	Muharrem Zabeli, Bastri Zeka and Afrim Osmani	Thermal analysis of AlSi10Mg alloy and heat treatment hardening
	24	Bastri Zeka, Muharrem Zabel and Afrim Osmani	research of reactıons on ferronıckel laterıte by rotary kıln furnace process
	15	Kajtaz Bllaca	Superzeta functions
	40	Arben HAZIRI, Ilir MAZREKU, Ilirjana OSMANI, Ibrahim RUDHANI	Synthesis and Anticoagulant Activity of the Synthetic Coumarin Derivatives
12.30-14.00	**LUNCH---BREAK**		

14.00-16.00	154	Fatima Benrachi, Nadjet Laouet and Hanane Saifi	Nuclear structure investifation of A=80 neutron-rich systems in the vicinity of 56Ni mass region
	121	Fazıl Gümüşay, Ünver Özkol and Süphan Ercan	Design And Optimization Of An Eiffel Type Wind Tunnel For Scaled Vehicle Tests
	195	Cezary Kraśkiewicz, Artur Zbiciak, Przemysław Mossakowski, Kacper Wasilewski and Andrzej Długołęcki	Field Tests on a Track Structure Equipped with Rail Dampers
	220	Abdelaziz LAKEHAL, Farouk MAHFOUDI	Structural failures diagnosis in water networks Based on conditional probability theory
	178	Mustafa Senay	Exploring MOND Theory in the Context of Fermionic q-Deformation: A New Approach to Modified Gravity
	180	Kutlay Sever, Hüseyin Yılmaz and Metehan Atagür	Electrically conductive polymeric hybrid composites with organic and inorganic fillers: production and characterization
	182	Gökhan Başman, Erdoğan Karip and Cengiz Yaşin	Recycling of Gangue Mineral (Pasa) and Its Use in Filled Concrete
	406	Yusuf Ceylan	Radiation Protection Efficiency of 10Bi2O3-10Nb2O5-80TeO2 Glasses
	407	Yusuf Ceylan	Mean free path of glass samples in terms of radiation shielding
	408	Yusuf Ceylan	Effective Atomic Number and Electron density for some glass to test shielding properties
16.00-16.15	**BREAK**		
16.15-18.00	155	Fatima Benrachi and Nadjet Laouet	Beta decay nuclear properties of A=74 Isobars
	239	Djamel herbadji, Aissa Belmeguenai, Abderrahmane Herbadji, Noubeil Guermat	Voice encryption scheme based on enhanced quadratic chaotic
	254	Sarra GARAH, Abelmalek BOUMALI, Hadjar Rezki	Gravitational Waves
	265	Ahmed BENYOUCEF, Youcef ZENNİR, Ammar BELATERACHE	Enhancing Hexapod Robot Locomotion Control through PID Controller Optimization using Genetic Algorithm
	332	Hamide Ayed. Ghoudelbourk	Study of the influence of atmospheric parameters on the performance of photovoltaic cells
	291	M.I. Sayyed, Kawa M. Kaky	Radiation shielding properties of synthesized Boro-tellurite glasses influenced by heavy metal
	359	Sabah FETAH, Walid MENASRI, Sansabilla BOUCHAREB	Theoretical investigation of the optical properties of the Hg2CuTi-type full-heusler compound Ti2NiZ(Z=Al,Ga)
	370	Kenza Djilali Djebbour , Mokhtar Nebab, Ait Atmane Hassen, Bennai Riadh	Dynamics analysıs of functionally graded reinforced carbon nanotubes beams restıng on elastıc foundatıon
	297	Yuyong Chen, Jingxi Wu, Ping Sun	Microstructure and Mechanical Properties of In-situ High-Temperature Titanium Matrix Composites

29 October 2023-Sunday

ROOM-1

10.00-11.00	**Session Chair : Dr. Feride KULALI--** Uskudar University, Istanbul / TURKEY **Invited Speaker 4:** Prof.Dr. Gerhard-Wilhelm WEBER–Poznan University of Technology-POLAND "Statement of Mutual Interaction between Finance and Human Factors by Various Types of Indicators" **Invited Speaker 5:** Prof.Dr. Shaaban Khalil–
11.00-11.30	**BREAK**

29 October 2023-Sunday

	ROOM-1		
11.30-12.30	**Session Chair : Dr. Feride KULALI--** Uskudar University, Istanbul / TURKEY		
	273	Dalila Boucherit, Ismail Boucherit	Evaluation of the time function used in concrete creep and shrinkage prediction models.
	170	Ahmed Mohamed Khalafallah Abdalaziz and İsmail Hakkı Kara	The Hardness and Microstructure Properties of Zn-Mg-Ca Alloys
	169	Yasin Ozgurluk	Investigation of the oxidation behavior of new generation zirconia (ZrO2) based thermal barrier coating (TBC) systems stabilized with calcium oxide (CaO)
12.30-14.00	**LUNCH---BREAK**		
14.00-16.00	107	Kenan Pallusha, Nderim Beqiraj, Fadil Ajredini, Neset Izairi, Yllka Kabashi and Skender Kabashi	Green Zone self-sustainable Park
	315	Nina T. Morozova, Fedor A. Pleshakov	Research and design of tether robots for three-dimensional large-scale printing
	343	Adnan A. Hnaif	A New Framework to Cybersecurity Strategies for Protecting Computer Networks
	167	Yasin Ozgurluk	Investigation of the oxidation behavior of new generation zirconia (ZrO2) based thermal barrier coating (TBC) systems stabilized with calcium oxide (CaO)
	369	Deva, Nurten, Muharrem Zabeli, Bastri Zeka	Experımental research of copper cathode gaıned durıng the electrolytıc refınıng process of the secondary copper anodes
	301	Cagrı Yılmaz	Utilizing a forced Van der Pol-Rayleigh-Helmolzt oscillator under heptamodal-frequency operations in casimir force measurement
	100	Cagri Yilmaz	A Laplace transformation-based analytical approach to investigate dynamic acoustic force sensitivity by utilizing resonant micro-cantilevers in monomodal and bimodal operations
	307	Zaki SU'UD, Feriska H. IRKA, J. Pierre Ndayiragije, Nur Asiah APRIANTI, R.D. SYARIFAH , ZUHAIR	CONCEPTUAL DESIGN STUDY OF MODULAR VERY SMALL GCFR
16.00-16.15	**BREAK**		
16.15-18.00	64	Emin Cantez, Oğuz Alper İsen and Serkan Aydın	Detection and Prevention of Quality Errors by Making Precise Measurement Integrated into the Production Line with Image Processing Techniques in Fast Press Lines
	357	SAMAI, OUSSAMA, Rayane Karim, Allaoui Omar	Machine Learning for Phase Diagram Construction: A Data-Driven Approach
	382	Mouna BOUHELAL, Abir SELIM, Florent HAAS	Shell-Model Study of the Spectroscopic Properties of the isobaric triplet 26Mg−26Al−26Si
	160	Prof.Dr.Ulviye Bunyatova, Cengiz Kocum, Orhan Erdem Haberal, Kubra Erkan Turkmen, Onur Kocak and Gül Ozdemir	Pathogen detection in biological media using a new bio-sensing device
	6	Oğuz Alper İsen, Emin Cantez and Serkan Aydın	Detection of Oil Film Layer on Metal Sheets with IR Illumination and Image Processing

	ROOM-2		
11.30-12.30	**Session Chair : Dr. Kateřina Horáčková**- University of Pardubice / Czechia		
	397	Bilge ALBAYRAK ÇEPER, Hüsamettin Alperen ALABAŞ	Effect of Kerosene -Methane Blends on Flame Temperature and Pollutant Emissions
	363	Ezgi DOĞAN, Memduh KURTULMUŞ	Prıncıples and advantages of the wıre arc addıtıve manufacturıng (waam) process
	364	Ezgi DOĞAN, Memduh KURTULMUŞ	Waam propertıes of mıld and carbon steels
	334	Mehmet DAYIOĞLU, Rıdvan ÜNAL	Desing and Economic Analysis of a Grid-Tied Microgrid Using Homer Software
	335	Mehmet DAYIOĞLU, Rıdvan ÜNAL	Comparison of Different Forecasting Techniques for Microgrid Load Based on Historical Load and Meteorological Data
12.30-14.00	**LUNCH---BREAK --ONLINE**		
14.00-16.00 --ONLINE	356	Erdem ŞEN, Ali Hakan BÜYÜKLÜ	Applications on Autoregressive Conditional Duration Model and Minimum Distance Estimation
	373	Sahar Heidary, Cemile Ceylan, Turkay Toklu,Serife Ipek Karaarslan	Evaluation of the small-field output factor and profile measurements capability of a high-resolution CMOS array detector for Flat and unflat Beams.
	381	A. Cihan OZDEMIR, Dilek KUMLUTAS, Erdem SARICA, Ozgun OZER, Utku Alp YUCEKAYA, Kadir BOZDEMIR	Soğuk İklim Koşullarına Uygun Split Klima İç Ünitesinin Hesaplamalı Akışkanlar Dinamiği ile Modellenmesi
	380	Ahmed Abdulkareem Abbood ALBUMEFREJ, Iskender AKKURT	Natural Radioactivity of oil sample in Southern Iraq
	216	Feyza Nur ÖZDEN, Celal Onur GÖKÇE, Güray SONUGÜR	Farklı Topolojilerde Sentetik Kabuk Veri Setleri Üzerinde K-Means Yönteminin Detaylı Performans Analizi
	290	Ayse Nihan BASMACI, Seckin FİLİZ	Investigation of Electromagnetic Wave Propagation in Triple Walled Carbon Nanotubes
	277	Zuhal ER, Ugur Ziya SOKU	Using Inland Sea Water Opportunities in Case of Disaster And Crisis
	278	Zuhal ER, Ugur Ziya SOKU	Academic Studies on How the Sea Trade Policy of Turkey Was Going to the 22th Century
	201	Benbahouche Lynda and Khelefhoum Abdelhamid	Structural, electronic and optical properties of TlGaX2 (X: S, Se) monoclinic compounds
16.00-16.15	**BREAK--ONLINE**		
	282	Adalat HASANOV, Backramjan RASAKHODZHAEV, Elmaddin ABBASOV,Dildar MAMMADOVA, Sevinc QASIMOVA	System for transfer and converting various natural types of energy
16.15-18.00 --ONLINE	404	Esra Koca	Mathematical Programming Formulations for Network Improvement Problems
	198	Dr.Ümran Kaya and Dr.İsmail Altunhan	ANFIS and NLP use on cost and schedule management at oıl and gas projects
	170	Doç. Dr. İlyas Kartal and Ms. Hilal Selimoğlu	Usibility of Pine Sawdust and Cotton Together as Filler in Recycled Polypropylene Composites
	361	Bashkim DALIPI, Naim SYLA, Fisnik ALIAJ, Arbër ZEQIRAJ, Donat DALIPI	Ionospheric plasma parameters derived from the power spectrum of the EISCAT Svalbard radar

	362	Donat DALIPI , Naim SYLA, Fisnik ALIAJ, Arbër ZEQIRAJ, Bashkim DALIPI	Computer modeling of incoherent scattering spectrum
	200	Besim Xhafa, Yllka Kabashi and Skender Kabashi	Comparative benefits of hybrid treatment planning technique for left-sided breast cancer in radiotherapy
	320	Muhammed Enes EREN, Prof. Dr. Ali Hakan BÜYÜKLÜ	Improving Prediction Accuracy of Machine Learning Using Meta-Analysis Results
	413	İlyas KARTAL, Mehmet TUNÇ	Meşe Ağacı Talaşı Dolgulu Polyester Kompozitlerin Mekanik Özelliklerinin İncelenmesi
	319	Neslihan İYİT	The Superiority of Generalized Poisson Mixed Regression Model in Modeling Global Lung Cancer Prevelance in the Aspect of Environmental Health, Climate Change, and Ecosystem Vitality to Achieve Sustainable Development Goals by 2030
	162	Ipek Atik	Comparison of Different Deep Learning Methods for Aircraft Detection
	163	Ipek Atik	Military Object Detection with Defense-oriented Deep Learning Methods: New Approaches for Robust and Accurate Detection
	164	Ipek Atik	Detection of Military Vehicles using Deep Learning and Object Recognition Techniques
	165	Ipek Atik	Fire Detection Using Image Processing and Deep Learning Methods

	ROOM-3		
11.30-12.30	**Session Chair : Prof.Dr. Ahmet BEYCİOGLU**—Alpaslan Turkeş University, Adana / TURKEY		
	39	Dalila Yamani	A hybrid course to study the waves' interference phenomenon. What is the impact on the students' conceptual understanding?
	46	Sidahmed Lachenani, Billel Bengherbia, Mohamed Rebiai and Mohamed Ould Zmirli	Optimizing Defect Detection in Ball Bearings: A Robust Signal Filtering Approach with Dynamic FIR Filter Coefficients
	354	Zeynep YARAR, Ozge KOZGUS GULDU, Emin Ilker MEDINE	Synthesis And Characterization Of EGCG Loaded Silica Nanoparticles
12.30-14.00	**LUNCH---BREAK**		
14.00-16.00	310	Hüseyin Müştak, Günhan Bayrak	Investigetion of the corrosıon effect on en aw 5005 aluminum alloy welded at dıfferent weld rates wıth aa5356 filler metal usıng by mıg weldıng technıque
	311	Asil AYAZ, Gizem Dilara ÖZDEMİR, Utku Kürşat ERCAN, Kutlay SEVER	Investigation of the influence of atmospheric pressure plasma surface treatment on adhesively bonded glass fiber reinforced epoxy composite joints
	312	Asil AYAZ, Gizem Dilara ÖZDEMİR, Utku Kürşat ERCAN, Kutlay SEVER	Effect of atmospheric pressure plasma treatment on adhesively bonded single lap joints of glass fiber reinforced epoxy composite and aluminium alloy
	5	Mokhtar Nebab, Kenza Djilali Djebbour, Ait Atmane Hassen and Riadh Bennai	On guided wave propagation in functionally graded materials beams resting elastic foundations
	7	Mohammed Oubelkacem Azzoug, Tarek Messai, Mohammed Moussaoui, Farid Belmenouar and Brahim Mahfoud	electrolyte temperature ınfluence study on the electrochemıcal behavıor of weldıng cords
	187	Fadila Mezrag, Nadir Bouarissa, Nor El Imane Beddar, Nour El-Houda Fares and Fahima Fares	Pseudopotential Analysis of Refractive Index and Dielectric Constants in ZnxCd1-xS semiconductor ternary alloys

16.00-16.15	**BREAK**		
16.15-18.00	394	Mucize SARIHAN, Işılay BİLGİÇ	Evaluation of Radiotherapy Students' Knowledge Levels about Nuclear Medicine and Nuclear Energy
	395	Berra Seda SARIHAN, Mucize SARIHAN, Halil SOYAL, Işılay BİLGİÇ	Designing the Interior Structure of Tomography Imaging Rooms for Radiological Imaging
	353	Osman GÜNAY, Caner YALÇIN, R. Taygun GURAY Taylan YETKİN	Determination of Levels of Artificial Radioactive Cs-137 Dose in Various Soil Samples in Dilovası-Kocaeli
	400	Nurdan Karpuz	A Qualitative Study on the Effect of Behavioral Sciences Course on University Students' Thoughts, Attitudes and Behaviors
	398	Nusret KARPUZ, Serdar ÖGEL	Investigation of the Quality of Life of People in Need with the Effect of Social Assistance and Solidarity Foundation
	396	Mucize SARIHAN, Halil SOYAL, Işılay BİLGİÇ	Radıatıon workers ın hospıtals and managerıal ethıcs
	231	Nurdan Karpuz	Linear Attenuation Coefficients 40MgO–30SiO2 – 20B2O3–10La2O3 Glasses
	232	Nurdan Karpuz	Effective Atomic Numbers of Magnesium Borosilicate Glasses
	266	Aycan Sengul	Investigation of radiation shielding properties of Ni-MOFs material using GAMOS Monte carlo simulation code

POSTER PRESENTATIONS
28 October 2023-Saturday

	Session Chair : Dr. Nurdan KARPUZ – Amasya University -TURKIYE		
10.00-12.30	161	Kateřina Horáčková and Helena Černocka	Issues of PORT and PICC vascular access devices
	16	Elbahi Toubal, Abdelkader Belkhir, Messaoud Rahim and Karim Boudjebbour	A model-driven approach for composing web services based on BPMN diagrams
	69	Sorya Nekkaa, Meriem Bedreddine and Melia Guessoum	Environmental Properties of Spartium junceum Fibers Reinforced Poly (lactic acid) Composites.
	78	Loubna Mentar, Ibrahim Yaacoub Bouderbala and Amor Azizi	Effect of CuCl2, NaCl and KCl on the properties of Cu2O thin films for photovoltaic applications
	82	Nawel Saidji	Stability and degradation kinetics of anthocyanin
	85	Abderahim Abada, Abderrahmane Younes and Rachid Amraoui	Electromagnetic and Mechanical Properties of Nanostructured Al-Ti alloys
	86	**Rachid Amraoui,** Abderrahamne Younes and Abderahim Abada	Magnetic and Structural Properties of Nanostructured AgFeO2 and CuFe2O4 Alloys
	99	Dr Ahlame Mraouefel, Lakhdar Guerbous and Madjid Diaf	Annealing effects on structural and luminescence properties of Tb3+-doped yttrium phosphovanadates Nanophosphor Synthesized by Sol-Gel Method
	119	Mme Feriel Reggabi and Mr Islem Benghezal	Robustness & validation RP-HPLC Method for Assay of Pinaverium Bromide Tablet
	138	Rafik Makhloufi, Ahmed Boussaha, Lazhar Baroura and Hamza Bennaceur	Characterization of an iron-based alloy produced by powder metallurgy
	158	Hamza Bennaceur, Hacene Ameddah and Hammoudi Mazouz	Numerical Fatigue Analysis of the Polyethylene Insert of a Total Knee Prosthesis
	176	Boussaha Bouchoul, Leila Lamiri, Mohamed Hamidouche, Abdelghani Kenzour, Mohamed Tahar Benaniba, Hamlaoui Katib and Ouafia Belgherbi	Investigation of physical and mechanical properties of DLP 3D Printed TiO2/photosensitive resin composites
	189	Fayssal Boufelgha, Rahima Zellagui, Mohamed Cherif Benachour, Heider Dehdouh, Noureddine Brihi and Slimene Hadjeb	Elaboration of SnO2 metal oxides for PLA polymer reinforcement
	191	Amale Mahi and Abdellah Hassaine	Analytical solution for free vibration analysis of a graphene-reinforced porous FGM beams under different boundary conditions
	204	Imene Bennia, Seddik Haddou and Samah Lounis	Numerical heat transfer of rectangular fins for different conditions validated by an experimental part
	221	Maamar MALKI, Sid Ali BOUBENDIR, Salah LARBI	Hydrodynamic Lubrication Analysis In Self-Lubricating Journal Bearings Using Power Law Fluid Model
	241	Boubechou CHOUBEILA, Bouchoucha ALI, Zaidi HAMID	Study of the Tribomechanical Behavior Of Dynamic Copper-Steel And Brass-Steel Couples
	245	Gheribi HASSINA, Teyar SOUMIA, Belaadi AHMED	Study of a Composite Material Reinforced of Strelitzia Reginae Fiber
	263	FERRADJ Abdelhak, IDOUHAR Madjid	Monitoring of anionic surfactant levels in wastewater
	271	Noudjoud Hamdouni, Mohamed Larbi Medjroubi, Ali Boudjada, Ouarda Brihi and Olivier Jeannin	Crystal structure and quantum chemical dft calculations of 2,6-dichloro-4-nitrotoluene
	283	Karima SELLAMI, Nabila LABSI, Youb Khaled BENKAHLA, Monssif NAJIM, M'barek FEDDAOUI	Numerical Investigation of Heat and Mass Transfer Process of a Direct Evaporative Cooler
	61	Farida Hamdache, Farid Halet, Ahmed Reda Yeddou, Abdelmalek Chergui and Boubekeur Nadjemi	Application of peanut shells as low cost adsorbent for cationic dye adsorption

	62	Farid Halet, Farida Hamdache, Saida Bekhti, Salima Chergui, Ahmed Reda Yeddou, Abdelmalek Chergui and Boubekeur Nadjemi	Elimination of methylene blue dye in aqueous solution by ultraviolet (UV) radiation alone and in the presence of hydrogen peroxide
	57	Ahmed Reda Yeddou, Salima Chergui, Farid Halet, Abderrahmane Boutrif, Abdelmalek Chergui, Boubekeur Nadjemi and Aissa Ould-Drİs	Cyanide Removal from Aqueous Solution by Adsorption on Activated Alumina
	59	Salima Chergui, Farid Halet, Abderrahmane Boutrif, Abdelmalek Chergui, Boubekeur Nadjemi, Ahmed Reda Yeddou and Aissa Ould-Dris	Preparation of Copper Impregnated Activated Carbon and its Use for Cyanide Removal in aqueous media
	97	Zohra Douadi	The Role of Alternative Experiments in Correcting Middle School Students' Misconceptions about the Boiling Concept in Algeria
	79	Sara Chérifa Bennedjai, Dalila Hammoutène and M.Luisa Senent Diez	THEORETICAL CHARACTERIZATION OF C3H AND C5H AND THEIR ANIONS
	74	Leila Boutemtam and Mohamed Amine Ferhat	Comparing methods of extracting essential oils from citrus plants.
	65	Salima Kaizra	Electrodeposited Cu2O on GC and its application for electro-oxidation of MB
	89	Fatma Zohra Ferrahi and Baya Berka	Moringa Extraction ultra sound method highest performance
	347	Farıd BETTİNE, Ammar HABOUSSİ, Fayçal BOUZİD, Bouchoul BOUSSAHA, Rafık MAHDAOUİ, Fayssal BOUFELGHA	Evaluation of the Effect of Infill Patterns and Orientations on Mechanical Properties of 3D-printed samples
	47	Abdellatif Fahima, Dahmane Dahmane and Messaoudi Mohammed	HPLC/DAD of polyphenolic compounds, antioxidant activity of Algerian Spirulina
	81	Habiba Boukerche, Nawel Saidji and Hind Mokrane	Optimization of the ultrasound-assisted extraction of anthocyanins and total phenolic compounds in Hibiscus Sabdariffa L.
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	48	Lebba Ghenam	Study of the deconfinement phase transition with q-deformed algebra
	52	Derbil Samia	The study of the dielectric behavior of healthy and altered materials
	58	Embarka Boutalbi and Leila Ait Gougam-Tribeche	Planck's law and Einstein coefficients in Tsallis q- statistics
	80	Karima Mezouar and Amal Ait El Djoudi	Effect of The Curvature Term in the Density of State on the Nucleation of Quark-Gluon Plasma Droplets in Hot Hadronic Gas
	309	**Nabila BOUTOUCHENT-GUERFİ** , Sonia RETİEB, Karim Hireche, Nesrinne Seddiki	Unexpected effect of aging on the dielectric properties of PE used in cable coating expired and irradiated by γ-Co60 up to 50 KGy
	316	Sid Ali BOUBENDIR, Maamer MALKI, Salah LARBI, Salim TRIAA, Lynda BOUBENDIR	A non-newtonıan behavıor effect on Hybrid journal bearıngs performances
	342	**Brahim IDIR,** Farida KELLOU-KERKOUCHE, Lynda BENHADDAD, Mustapha DJAMA , Amel KOUACHE	Bio-molecule as a sustainable protection against corrosion of ductile iron in acid solution: Experimental and computational studies
	366	Souad Wassila RACHEDI and Latifa Guezzen	Density dependence of the relative intensity of EUV lines emitted from ArXV ions excited by an electron beam
	374	Dris BENDJABALLAH, Adel MILES, Ali BOUCHOUCHA	Modeling and numerical simulation of car frontal crash test using Finite element method
	375	Choubeila BOUBECHOU, Adel MILES, Ali BOUCHOUCHA, Dris BENDJABALLAH	Comparison of the thermomechanical behavior of copper-steel and brass-steel tribological couples
	383	A. MOHAMMED KRARROUBI, C. MOHAMMED KRARROUBI, A.ROUABHIA1.M.Othmani	Performance and degradation of photovoltaic panels in the Saharan Environment
	93	Karima Boudhar and Mahdi Debieche	Crystal structure and quantum chemical DFT calculations of C,p-methoxyphenyl-N-phenyl nitrone
	159	Fatma Zohra Tichouche, Abdelkader Djilali Hammou, Belkacem Kired and Zaza Gharbi	Experimental modal analysis of cantilever Euler-Bernoulli beam

	136	Zidelmel Sami and Mansouri Tahar	Critical strain for dynamic recrystallisation during constant strain rate hot deformation of X70 steel
	137	Zidelmel Sami, Dakmoussi Maamar and Allaoui Omar	Effect of boriding treatment and operating parameters on sand slurry erosion of X52 steel
	153	Artan Llozana, Altin Gjevori, Arber Zeqiraj, Naim Syla and Fisnik Aliaj	Experimental and Modeling Study of binary mixtures MTBE with Cyclohexane and Benzene
	188	Fadila Mezrag, Nadir Bouarissa, Lynda Lakhal, Nour El Houda Fares and Fahima Fares	Quantum Confinement Effects on Energy band Gaps in II-VI Semiconductor Quantum Dots: A Study of MgSe, CdTe, ZnS, ZnSe, and ZnTe
	355	Ahmed BELGACEM, Abdelhamid M'RAOUI	Simulation of hydrogen liquefaction and optimization of energy consumption
	101	Fouad Kerkar, Abdelkrim KheloufI, Djamel Ouadajaout and Nahed Dokhan	Multicrystalline Silicon Wafers Morphological and Electrical Evaluation
	365	Rahma BENSAID and Fatima Z.GHALEM	The probabilities of hyperfine- induced electric dipole transitions of x-line in He-like ions with nuclear spin I=3/2 excited by impact of electron beam.
	20	Karim Boudjebbour, Abdelkader Belkhir, El Bahi Toubal, Ahmed Cherif Mazari and Messaoud Rahim	Multi-label classification of social networks users used for recommendation systems
	44	Mohamed Rebiai, Billel Bengherbia and Sid Ahmed Lachenani	Nonlinear and non-stationary vibration signal analysis based on the Fourier Decomposition Method
	256	Ameur Ouali, Smail Lamara, Foudil Sahnoune	Crystallization Kinetics Study of α-Cordierite from MgO–Al2O3–SiO2–TiO2
	229	Nadjet BOULKROUNE, Soumaya LAROUS, Lyna DJEBABLA, Rayen-Neoussem BOUDERSA, Hibat Allah-Nourhane BOUCHAIR	Liquid-liquid extraction for quaternary systems: water+formic acid+acetic acid+heptane/hexane
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	298	Abdelmadjid BOUSSENDEL, Menad HERAIZ	Study of the substrate effect on the magnetic properties of the Fe(001) monolayer in the Fe(001)/Rh system
	304	Boussendel Abdelmadjid, Amar Djemli, Foudil Sahnoune	Lanthanum Manganite LaMnO3 Crystallization Kinetics Prepared Through Sol-Gel Auto-Combustion Method
	323	Nadir Bouarissa, Fadila Mezrag, Nour-El-Houda Fares, Fahima Fares	Pseudo-potential calculations on electronic and optical properties of gallium phosphide under pressure
	329	K. M'hammedi, F. Bouamra, I. Bachir, M. Berouaken, N. Gabouze	Sol-gel assisted synthesis of Co doped NiO thin films as an electrode material for supercapacitor application
	236	Soumaya LAROUS, Nadjet BOULKROUNE,Samaher BEZICHE, Maissa BENSLIMANE	Liquid-liquid equilibrium for ternary systems: water/propanol/ n-hexane water/propanol/ ethyl acetate: Experimental and correlation data
	95	Fatiha Smaili, Salima Kaizra and Sabrina Tabti	Removal of Safranin by Direct Electrochemical Oxidation Method Using a β-PbO2 as Anode
	73	Saida Bekhti, Mohamed Belkacem, Farid Halet, Ahmed Réda Yeddou and Boubekeur Nadjemi	Identification of fouling mechanism and degradation of RO membranes using real DATA: Case study

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10.00-12.30	**Session Chair : Dr. Nurdan KARPUZ –** Amasya University -TURKIYE		
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	4	Nazmi Hasi and Besire Tahiri	Seismotectonic and neotectonics, the cause of the seismicity of the territory of Kosovo
	29	Lakhdar Bouras, Tahar Boukra and Bilel Ayachi	Comparative Study of Fuzzy Logic and Perturbation and Observation MPPT Algorithms for Photovoltaic System Optimization
	31	Dr. Tahar Boukra, Bilel Ayachi and Yassine Bensafia	Tracking Trajectory In Fractional Adaptive Control: Application To Scara Robot
	114	Nour El Houda Fares, Nadir Bouarissa, Fahima Fares and Fadila Mezrag	Lattice dynamics and electric polarization field of ZnS upon compression
	129	Besire Cena, Luan Qafmolla and Nazmi Hasi	Conditioning of Low-Level Radioactive Wastes (LLRW), Spent Radiation Sources (SRS), their transport to Temporary Storage Facility in Kosovo and Albania
	141	Allaoui Omar, Belhocine Abdelghani and Maazouz Mourad	Mechanical Characterization of Chromium Carbide Layers Obtained on 100Cr6 and X200Cr12 Steels by Conversion Treatment
	143	Serkan Aydın, Oğuz Alper İsen and Emİn Cantez	LoRaWAN-based Alert System for Selective Laser Melting Machines
	144	Oğuz Alper İsen, Emİn Cantez and Serkan Aydın	Empirical Assessment of Siemens S7-1200 and Arduino Portenta H7 in Industrial Automation
	145	Serkan Aydın, Oğuz Alper İsen and Emin Cantez	Evaluating Photonic and Laser-Based Techniques for Microaperture Inspection
	146	Emin Cantez, Oğuz Alper İsen and Serkan Aydın	Comparative Analysis of Monofluid and Metalo-Fluidic Coolants in Thermal Management
	148	Hacene Hachache, Zineb Hamlati and Safia Alleg	The influence of the governing parameters on mechanical and thermal properties of two species of hybrid composites Al-2wt%MWCNTs-2wt%B4C and Al-4wt%CNTs doped by graphene at low milling time
	166	Djamel Herbadji, Noubeil Guermat and Abderrahmane Herbadji	A facial recognition-based encryption technique based on chaos theory
	183	Younes Nezzari, Warda Darenfad, Kamel Mirouh, Noubeil Guermat and Rayene Merah	Influence of precursor solution on the properties of Co3O4 thin films deposited by spray pyrolysis
	184	Warda Darenfad, Noubeil Guermat, Kamel Mirouh, Younes Nezzari and Rayene Merah	Evaluating structural, morphological, optical and electrical aspects of NiO/BiMnO3/FTO heterojunction
	192	Amale Mahi	An accurate analytical approach for the free vibration analysis of CNT-reinforced porous composite beams under different boundary conditions
	197	Said Boucetta	Ab initio study of the structural, electronic and optical properties of ZnSiAs2
	243	Youcef ZENNIR, Ahmed BENYOUCEF, Badreddine DJEGHADER,Naila HAMİOUDA	Photovoltaic solar battery charge control with MPPT P&O and PSO algorithm
	259	Hadjar REZKI, Slimane ZAIM, Sarra GARAH	Bosons Creation in Non-Commutative De Sitter Space
	264	Ali AMRANE, Youcef ZENNİR, Denis POMORSKİ	Trajectory Tracking Control of an Autonomous Electric Wheelchair Using Particle Swarm Optimization-Based Variant PID Controller
	285	Nabila LABSI*, Nihal TOUDJA, Nesrine ALLALOU, Youb Khaled BENKAHLA	Hydrodynamic behaviour of the flow of a non-Newotonian nanofluid: Silver/Carreau-Yasuda
	284	Nabila LABSI, Khaoula BRAKBİ, Asma AZİBİ, Youb Khaled BENKAHLA	Study of heat exchangers fouling in the preheating circuit of crude oil stabilization unit in Hassi Messaoud
	326	J.Francisco Muñoz-Elguezabal, J.Diego Sánchez-Torres, Riemann Ruiz-Cruz	Enhancing Financial Time Series Forecasting with a Temporal Ensemble Machine Learning Framework
	327	J.Francisco Muñoz-Elguezabal	Evidence of Symbiotic Convergence in Narrow-Intelligent Market-Making Algorithms on Decentralized Exchanges

	90	Bahdja Guerfi, Nadia Khader, Amina Zouani and Fatma Zohra Hadjadj Aoul	CHARACTERIZATION OF THE ESSENTIAL OILS OF LAVANDULA STOECHAS AND LAVANDULA ANGUSTIFOLIA FROM ALGERIA
	128	Samia Berouaken, Mounia Benamara, Dahmas and Samia Abdi	MICROBIOLOGICAL CONTROL OF THE EFFECTIVENESS OF THE DISINFECTION PROCESS FOR ORTHODONTIC PLIERS
	3	Nazmi Hasi and Latif Hasi	SEISMOLOGICAL INVESTIGATIONS FOR LOCATIONS OF SECONDARY STATIONS IN KOSOVO
	120	Mr Islem Benghezal and Mme Feriel Reggabi	Validated LC Method for measuring the release of Solifinacin Succinate Tablet Immediate Release in Dissolution Media
	333	Amina SRIBA	Fusion and Heat Affected Zones Damage During Fatigue Assessment Assisted with Digital Image Correlation
	304	Boussendel Abdelmadjid, Amar Djemli, Foudil Sahnoune	Lanthanum Manganite LaMnO3 Crystallization Kinetics Prepared Through Sol-Gel Auto-Combustion Method
	258	Foudil SAHNOUNE, Amar DJEMLI, Abdelmadjid BOUSSENDEL, Essebti Dhahri and Nouari Saheb	Kinetics, Phase Transformations and Sintering of Mg-doped LaMnO3
	228	Lyes ZOUGAR, N. BENTAIEB, Imen LARBI, Randa SOUICI, Samira SALI, Salim KERMADI	IMPACT OF GALLIUM DOPING AND HEAT TREATMENT ON SPRAYED ALOX PROPERTIES FOR SILICON SURFACE PASSIVATION
	218	Bouzid MAAMACHE, Brahim BELKESSA, Naima OUALI, Billel CHENITI	Effect of number of passes on local mechanical properties of WM and HAZ sub-zones of the API 5L X70-pipeline weld joint
	219	Billel CHENITI, Brahim BELKESSA, Bouzid MAAMACHE, Naima OUALI, Viktor PUCHÝ, Pavol HVIZDOŠ	Interfacial evolution of WC-Co/AISI 304L diffusion bonded joint obtained by flash SPS technique
	223	Brahim BELKESSA, Naima OUALI, Bouzid MAAMACHE, Billel CHENITI	Mıcrostructure and mechanıcal properties of saf 2205/apı x52 steels dıssımılar metal joınt made by rotary frıctıon weldıng
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	246	Teyar SOUMIA, Gheribi HASSINA, Belaadi AHMED	Influence of The Matrix Nature on The Mechanical Properties of a Composite Material From the New Zealand Flax Fiber
14.00-18.00	340	Abdelghani Khaldi, Nadir Bouarissa, Laurent Tabourot	Electronic structure and optical characteristics of CuO and Cu2O materials
	341	Hajdar SADIKU, Mazllum KAMBERI, Gazmend NAFEZI	Creep coefficient for self-compacting concrete (SCC)
	348	Abdelghani BOUCHEHAM, Ahmed Bahaeddine BENSEDIRA, Hakim KORICHI, Abbes MARREF, Chahinez NASRAOUI, Boutaleb LABDELLI, Lyes BENHERRAT and Abdelkader DJELLOUL	Investigation on mechanism formation of silver-aluminum contact on p+ emitters
	324	Kaltrine JAKUPİ, Sehad KADİRİ, Vladimir DUKOVSKİ, Fesal SELIMI, Burim UKA, Labinot KASTRATI, Gezim HODOLLI	Controlling Electron Density in 3D Printed PLA Objects: Impact of Key Independent Parameters
	133	Fesal Selimi, Doriana Paloji, Labinot Kastrati, Gezim Hodolli, Kushtrim Dina, Brunilda Profka Haxhiu and Behar Rraci	A dosimetric comparison of 3D Conformal Radiation Therapy and VMAT techniques in the treatment of locally advanced cervical cancer

	331	Fetah Sabah, Didaoui Saadia	Structural, Electronic, Optical and Magnetic Properties of CuMnInSe3 compound
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	386	Imane MAYOUF, Nadjat CHELGHOUM , Melia GUESSOUM	Monitoring poly(lactic acid)/trimilitic anhydride/polyethylene terephthalate fiber biocomposites water absorption and biodegradation in soil and compost mediums
	135	Noubeil Guermat, Warda Darenfad, Kamel Mirouh and Abderrahmane Herbadji	Structural, optical and electrical properties of sprayed ZnO thin film: influence of (Al and Mo)-doping
	156	Brahim Dennai, Abdelhakim Benali, Rachid Khelfaoui and Abdellah Benslimane	Improving the performance of a liquid micro mixer for different viscosity values
	386	Imane MAYOUF, Nadjat CHELGHOUM , Melia GUESSOUM	Monitoring poly(lactic acid)/trimilitic anhydride/polyethylene terephthalate fiber biocomposites water absorption and biodegradation in soil and compost mediums
	36	Isma Bozetine, Abdelhak Cheriet, Chafiaa Yaddadene, Fatima Boudeffar, Lamia Talbi, Ali Mameri, Amar Manseri and Aissa Keffous	Revealing the Role of PAA Binder in Si/Carbon Composite Anode for Li-Ion Batteries
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	132	Hamlaoui Katib, Bouchoul Boussaha, Lamiri Leila and Khouatra Radhia	Study of the effect of 3D printing parameters on the cross-linking rate of stereolithography.
	358	Bendeb Asma, Rayane Karim, Allaoui Omar	Utilizing Inverse Problem Approaches for the Determination of Interdiffusion Coefficients in Materials Science
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FOREWORD

Dear Colleagues,
I am pleased to host you all in **"9th International Conference on Computational and Experimental Science and Engineering (ICCESEN-2023)"**. The conference has been taken place in the period of 27-30 October, 2023 in Kemer-Antalya (Turkey) which is one of the best known holiday center in the World. The ICCESEN-2023 will provide excellent international forumand covers highlights about new results in the wide spectrum of categories from science and engineering in theory, methods and applications and also socal sicence in this year. The participants will have the opportunity to take part in the presentation of plenary lectures, contributed papers of both oral and poster session types, and of their scientific discussions. There are 10 different theme in ICCESEN-2023 and planning enlarge this topic in future.
Those are;

Theme 1. Physical Science and Technology
Theme 2. Mathematical Science and Applications
Theme 3. Energy and Applications
Theme 4. Earth Science and Applications
Theme 5. Engineering Science and Applications
Theme 6. Material Science and Applications
Theme 7. Biological and Medical Science and Applications
Theme 8. Education Technologies and Applications
Theme 9. Agricultural Science and Technology
Theme 10. Forestry and Environmental Science and Engineering

I hope that all participants will enjoy their visit and stay in Antalya-Turkey and also hoping to meet you again in somewhere else in Turkey for ICCESEN-2024.

Prof. Dr. İskender AKKURT
Chairman of the ICCESEN

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INVITED SPEAKERS

Prediction of excess thermodynamic properties of quaternary liquid systems from data of their lower order systems

Prof. Dr. Fisnik ALIAJ
Department of Physics, University of Prishtina, Prishtina, Kosovo

ABSTRACT

Artificial Intelligent (AI) comprehend solution in Agra production- Foodservice

Madjid FATHI✉
University of Siegen, GERMANY

ABSTRACT

With today's rapid development in application of Artificial Intelligent, we need to think up components that are able to be integrated and make AI approaches useable. This will be an aid to include and integrate together for more complicated aspects that doesn't exist relevant solution by single technology. Agricultural science and the food industry are among very important challenges in society. There is a lot of discussion about the AI developments, whether everything is going positively. Un fortunately exist some issues to be anxious about. Military, space engineering, Medical and mechanical engineering and Linguistic using AI successful nutrition industry are not exempt. In this area, AI can prevent the excess of medicines and also controls other environmental unfriendly issues. In this presentation, we would like to provide an overview of whether we are able to detect damage that can be used together with specific integrated knowledge.

The mainly needs for a healthy life should be attached on a healthy nutrition, as this is supposed to be controlled environmental aspects, irrigation and chemical additives. this is only possible with the use of AI, because only AI is possible to generate so many data and knowledge to offer an acceptance solutions.

✉ *Corresponding Author Email : fathi@informatik.uni-siegen.de*

Chemical Methods in Environmental Science

Dr. Manju D. CHOUDHARY
NISCAIR-INDIA

ABSTRACT

✉ *Corresponding Author Email:*

The Arts: Supported by Data Analytics, Deep Learning and OR: Human Creativity and the Art of Painting

Prof.Dr. Gerhard-Wilhelm WEBER
Poznan University of Technology-POLAND

ABSTRACT

A detailed computational mechanistic study of the atmospheric reaction of the simplest Criegee intermediate CH2OO with methane has been performed using the density functional theory (DFT) method and high-level calculations. Carbonyl oxides, commonly known as Criegee Intermediates (CI's) are the main intermediates from the gas-phase ozonolysis reaction. These reactions generate various chemical organic and inorganic species. The structures of all proposed mechanisms were optimized using B3LYP, M06-2X, and APFD functionals with several basis sets. The Criegee mechanism initially involves a highly exothermic 1,3-dipolar cycloaddition of ozone to the double bond to produce primary ozonide (POZ). The POZ dissociates into a highly reactive carbonyl oxide, non-convertible, distinct zwitterionic Criegee intermediate (syn and anti) conformers. Fifteen different mechanistic pathways were studied for the unimolecular dissociation of ethyl hydroperoxide and its bimolecular reactions with atmospheric species1. Both thermodynamic functions and activation parameters were calculated for all pathways investigated. The individual mechanisms for pathways A→ B, comprise two key steps: (i) the formation of ethyl hydroperoxide (EHP) accompanying with the hydrogen transfer from the alkanes to the terminal oxygen atom of CIs, and (ii) a following unimolecular dissociation of EHP. Pathways from C1→H1 involve the bimolecular reaction of EHP with different atmospheric species. The photochemical reaction of methane with EHP (pathway E1) was found to be the most plausible reaction mechanism, exhibiting an overall activation energy of 7 kJ mol-1, which was estimated in vacuum at the B3LYP/ 6-311++G(3df,3pd). All of the reactions were found to be strongly exothermic, expect the case of the sulfur dioxide-involved pathway that is predicted to be endothermic. The solvent effect plays an important role in the reaction of EHP with ammonia (pathway F1). Compared with the gas phase reaction, the overall activation energy for the solution phase reaction is decreased by 162 and 140 kJ mol-1 according to calculations done with the SMD and PCM solvation models, respectively1.

***Keywords**: Ethyl Hydroperoxide, Criegee intermediate, Methane; Unimolecular Dissociation, Bimolecular Reactions, Photochemistry.*

✉ *Corresponding Author Email : m.almatarneh@ju.edu.jo*

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Prof.Dr. Shaaban KHALIL
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ABSTRACT

✉ *Corresponding Author Email :*

PRESENTATIONS

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)
27-30 October 2023, ANTALYA -TURKEY

Abs. No: 2

Measurement of Tremors for the Seismic Station of Gllogovc-Kosovo

Nazmi HASI[1], Latif HASI[2], Besire CENA[1]✉
[1] University of Mitrovica "Isa Boletini", Faculty of Geosciences, Faculty of Food Tehnology, KOSOVO
[2] International Learning Group School, Prishtina, KOSOVO

ABSTRACT

To select a potential location for a future seismological station properly, it is of crucial importance to explore the existing local seismic tremor recorded by seismographs. This tremor/noise is referred to as seismic tremor, whereas it is necessary to define as precisely as possible its spectral characteristics. On the other hand, for the needs of microzoning, it is important to define the existence of possible geological layers and structures immediately below the location or farther, whose resonant characteristics could intensify the ground motion under the effect of strong (according to magnitude) local or regional earthquakes.). It is very important that the station location be as quiet as possible because the seismic noise can obscure the records at the selected location for seismic station. Therefore, in addition to other geophysical methods, it is of particular importance to define the spectral characteristics of the local tremor at the investigated sites.

Keywords: *noise, wave, seismicity.*

✉ *Corresponding Author Email : bessirecena@gmail.com*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)
27-30 October 2023, ANTALYA -TURKEY

Abs. No: 3

Seismological Investigations For Locations Of Secondary Stations In Kosovo

Nazmi HASI[1]✉, Latif HASI[2]
[1]University of Mitrovica, FG, Department of Materials and Metallurgy, PIM-Trepça, KS-40000 Mitrovica, KOSOVO
[2]International Learning Group School, Prishtina, KOSOVO

ABSTRACT

For the last decades, thanks to the use of modern instruments, conditions have been provided for instrumental recording of motions induced by strong earthquakes in different geological conditions so that the elements of effects from different geological conditions are contained in the obtained records. This provides a data base from which the effects from different geological conditions will be obtained through further investigations. In this context, the expansion of the network of secondary seismic stations plays a decisive role. Seismological and engineering-seismological investigations are of a special importance for the behavior of engineering structures and other structures of interest for the society under earthquake effects. This refers not only to the location of the structures themselves but also to their wider surrounding. The data on ground motion and response of structures to strong earthquakes are necessary for definition of the criteria for design of structures in areas of high seismic activity. The data on strong motion and response of structures during strong earthquakes are necessary for definition of the criteria for design of structures in areas characterized by a high seismic activity.

***Keywords**: Seismological, Seismicity, earthquake*

✉ *Corresponding Author Email : nazmi.hasi@umib.net*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)
27-30 October 2023, ANTALYA -TURKEY

Abs. No: 4

Seismotectonic and neotectonics, the cause of the seismicity of the territory of Kosovo

Nazmi HASI, Besire CENA✉
University of Mitrovica "Isa Boletini", Faculty of Geosciences, Faculty of Food Tehnology, Kosovo

ABSTRACT

The territory of Kosovo is situated in the Alpine-Mediterranean seismic belt. This belt comprises the wide zone of contact between the lithospheric plates of Africa and Eurasia, from Azores Islands up to the eastern border of the Mediterranean basin. In this zone, the concept of plate tectonics is especially complicated and represented with a significant number of tectonic blocks of different size resulting in numerous intersections of regional fault lines characterized with significant seismic activity. The Kosovo territory is involved in neotectonics processes that caused the formation of a number of morpho structural units with prevailing uplifting and subsidence. A large number of these tectonic faults represent seismogene lineaments that, due to intersection with other transverse faults, are frequently inactive along their entire length. A typical example is the Prizren tectonic fault in the northern part of the Shara block, with a length of about 30 km, whose morphological elements point to the possibility of generation of a strong earthquake. So, the seismotectonic and neotectonic characteristics of the territory of Kosovo condition its high seismicity.

Keywords: *Tectonic, Fault, Earthquake*

✉ *Corresponding Author Email : bessirecena@gmail.com*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)

27-30 October 2023, ANTALYA -TURKEY

Abs. No: 5

On guided wave propagation in functionally graded materials beams resting elastic foundations

Mokhtar NEBAB[1,2]✉, Kenza Djilali DJEBBOUR[2], Ait Atmane HASSEN [2], Bennai RIADH [2]

[1] Department of civil engineering, Faculty of technology, University M'Hamed Bougara of Boumerdes, Boumerdes, ALGERIA

[2] Department of civil engineering, Faculty of civil engineering and architecture, University Hassiba Benbouali of Chlef, ALGERIA

ABSTRACT

Functionally graded Materials (FGMs) are advanced materials designed for a specific performance or function in which the spatial gradation in structure and composition lend themselves to the appropriate properties. This happens by providing compositions, microstructures and depth-graded properties. In this work, wave propagation in the functionally graded materials beams (FGM) via uneven distribution of porosity has developed using the first shear deformation theory. In this theory was taken into account coefficient corrector shear deformation and neutral surface of functionally graded beams is determined. The functionally graded material properties follow a power law . It obtained the derivation of the equations of motion by the principle of Hamilton. Analytical Solutions of motions equations are presented for simply supported functionally graded beams using Fourier series . The results are compared with height shear deformation verify the validity of the developed theory. Effects of the parameter of elastic foundation on circular frequencies and phase of speed are investigated.

Keywords: *FGM , uneven porosity , FSDT , wave propagation.*

✉ *Corresponding Author Email : m.nebab@univ-boumerdes.dz*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)
27-30 October 2023, ANTALYA -TURKEY

Abs. No: 6

Detection of Oil Film Layer on Metal Sheets with IR Illumination and Image Processing

Oğuz Alper İSEN✉, Emin CANTEZ, Serkan AYDIN
Coşkunöz Holding, R&D Department, Bursa-TÜRKİYE

ABSTRACT

This paper proposes a novel method for the detection of oil film layers on metal sheets using infrared (IR) illumination and image processing techniques. The proposed approach utilizes the difference in reflective properties between clean metal surfaces and those covered with oil films under IR illumination. A high-resolution IR camera captures images of the metal sheet surface under different lighting conditions, and image analysis techniques are employed to extract features associated with oil films. The proposed method is capable of detecting oil films as thin as a few micrometers, and its performance is robust to variations in lighting conditions, camera settings, and surface roughness. Potential applications of the proposed method include the automotive, aerospace, and manufacturing industries, where the presence of oil films on metal surfaces can adversely affect product performance and quality.

Keywords: *oil film detection, infrared illumination, image processing, metal sheets, non-destructive testing*

✉ *Corresponding Author Email : aisen@coskunoz.com.tr*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)
27-30 October 2023, ANTALYA -TURKEY

Abs. No: 15

Superzeta functions

Kajtaz H. BLLACA ✉
Department of Mathematics, Faculty of Natural Sciences and Mathematics, University of Prishtina, KOSOVO

ABSTRACT

In the paper, we study superzeta functions associated to the zeros of the zeta function on the function field K. More precisely, we study three types of those functions as introduced by Voros, but in essence, the study is different only for functions of the first and the second kind.

Keywords: *Function fields; Superzeta functions; Riemann hypothesis; Li coefficients.*

✉ *Corresponding Author Email : kajtaz.bllaca@uni-pr.edu*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)

27-30 October 2023, ANTALYA -TURKEY

Abs. No: 16

A model-driven approach for composing web services based on BPMN diagrams

Toubal ELBAHI[1,2,3]✉, Belkhir ABDELKADER[3], Rahim MESSAOUD[2], Boudjebbour KARIM[1,2,3]

[1]Faculty of Sciences, University of Medea, Medea, ALGERIA.
[2]Laboratory of computer systems, USTHB University of sciences and technology, Algiers, ALGERIA.
[3]Research Laboratory in Advanced Electronics Systems, Medea University, ALGERIA.

ABSTRACT

In this work, we propose an approach based on a model-driven architecture to specify and implement Web services composition. The aim is to allow developers generating composite web service implementation from abstract models described in BPMN notation. BPMN notation is used to express how web services will be composed. So, a BPMN composition diagram is constructed to describe the composition scheme. This latter is then translated into BPEL code using the Accelio model transformation tool. Our approach is illustrated by a case study in which we show the advantages of applying MDA to generate the implementation of the composition of Web services.

Keywords: *Web services MDA Service composition BPMN BPEL.*

✉ *Corresponding Author Email : toubal.elbahi@univ-medea.dz*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)
27-30 October 2023, ANTALYA -TURKEY

Abs. No: 18

Analysis of the location of industrial facilities in relation to the urban area (Case study: City of Gjilan-Kosovo)

Ferim GASHI ✉, Ibrahim RAMADANI, Edon SHEMSEDINI, Shkumbin LUSHAJ
University of Prishtina, Department of Geography, Prishtina-KOSOVO

ABSTRACT

Industrial zones within urban areas today are facing various challenges, due to human activities and the rapid urbanization of cities. In many cities of Kosovo, industrial facilities are located within the urban area. From this, it is thought that industrial zones within urban areas should have special treatment in spatial planning. There are several methods for the spatial distribution of industry in the city, based on the location and type of industry. The objective of this paper is to analyze the relationships between industrial facilities and the urban area, as well as take the cause-effect relationship as a basis. The study mainly focuses on several analyzes of the existing state of the city of Gjilan, the distance of industrial facilities from the city center, the access of industrial facilities to the street, and the position of these facilities in relation to the residential area. In this paper, the analysis of what these facilities produce is not implied, since they are not a determining variable in the analysis of the ratio of industrial facilities to urban areas.

Keywords: *City, industrial facilities, relationship, city center, buffer zone*

✉ *Corresponding Author Email : ferim.gashi@uni-pr.edu*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)

27-30 October 2023, ANTALYA -TURKEY

Abs. No: 19

Bearing Remaining Useful Life Prediction : Baseline Study

Tahar BOUKRA[1] ✉, Bilel AYACHI[1], Yassine BENSAFIA[2]

[1] Laboratoire Electrotechnique Skikda – LES, Université 20 Août 1955 Skikda, ALGERIA

[2] Département Génie Electrique, Université Akli Mohand Oulhadj, Bouira, ALGERIA.

ABSTRACT

Our data-based approach to enhance the prediction of the Remaining Useful Life (RUL) of degraded bearing was based on the identification of new health indicator (HI) having observable change over time and connected with the system degradation process in a reliable and measurable way, by further preprocessing the extracted features in first attempt, then using Particle Filtering (PF) technique as a projecting algorithm to predict the RUL. The use of PF technique raises a problem of induced errors since the system state evolution (i.e., bearing health indicator in our case) usually integrated in PF as analytic expression even linear, logarithmic or exponential, doesn't fit exactly the failure behavior. Again, to address this issue, we propose to use an offline trained model, (i.e., Neuro-Fuzzy System (NFS) predictor), that fit perfectly the degradation process.

The proposed approach was validated through a set of bearing run to failures data provided by FEMTO-ST Institute mainly composed of run-to-failure vibration signals related to ball bearings from the experimental platform PRONOSTIA.

The results of the RUL predictions were benchmarked to several studies that utilize the same data. An overall low percentage error of 12.18% was achieved indicating that the model worked accurately and reliably on every tested bearing.

Keywords: *Health index (HI), Remaining Useful Life, Particle Filtering (PF), Prognostics and Health Management (PHM)*

✉ *Corresponding Author Email : t.boukra@univ-skikda.dz*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)
27-30 October 2023, ANTALYA -TURKEY

Abs. No: 20

Multi-label classification of social networks users used for recommendation systems

Boudjebbour KARIM[1,2,3] ✉, Belkhir ABDELKADER[3], Toubal ELBAHI[1,2,3] , Mazari AHMED CHERIF[1,2], Rahim MESSAOUD[1]
[1] Faculty of Sciences, University of Medea, Medea, ALGERİA.
[2] Research Laboratory in Advanced Electronics Systems, University of Medea, Medea, ALGERİA
[3] Computer Systems Laboratory USTHB, Algiers, ALGERİA

ABSTRACT

Most classification problems associate a single class with each example or instance. However, there are many classification tasks where an instance can be associated with one or more classes. This group of problems represents an area known as multi-label classification, which is widely required by contemporary applications such as document categorization according to context, classification of images according to their semantic content, and classification of songs in relation to emotions they evoke. This type of problem arises when classifying users based on their interests, where each user may have multiple interests. Nevertheless, determining the interests of users is not always a simple task. For example, it may involve processing a large amount of data, inferring interests based on indirect evidence, or dealing with the subjective nature of interests.

This paper proposes a mechanism for detecting users' areas of interest using web services, which can be used in a recommendation system. To achieve this, we propose a multi-label classification architecture that employs deep learning algorithms. Once the classification model is built, it can predict users' access to web services, and recommend new web services based on user's profiles.

Keywords: *Multi-label Classification, Supervised learning, User profile, Web service, Recommendation system, Deep learning.*

✉ *Corresponding Author Email : boudjebbour.karim@univ-medea.dz*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)
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Abs. No: 22

Thermal Analysis Of AlSi10Mg Alloy And Heat Treatment Hardening

Muharrem ZABELI, Bastri ZEKA, Afrim OSMANI✉
Faculty of Geosciences, University of Mitrovica, 40000, Mitrovica, KOSOVO

ABSTRACT

Aluminum which is considered as a metal with use and great perspective belongs to the group of non-ferrous metals due to its low density and suitable physical, mechanical and chemical properties which make its application possible in many branches of modern industry.

The mechanical and physical properties of aluminum are significantly improved by its connection with other elements such as; like, Mg, Mn, Cu etc., can be used for the production of various industrial products by molding, lamination, pressing, stamping etc.

In this paper the AlSi10Mg alloy was treated, the samples were analyzed by thermal analysis, heat treatment through hardness, the results which showed that the alloy hardness was significantly increased compared to before heat treatment. The purpose of this paper is to look closely at the stages of hardening and the change in hardness after melting and after heat treatment.

After the thermal analysis, the stages in detail of their creation in the laboratory conditions used during the experimental work with melting and the solidification process are defined.

Experimental work showed that microstructural and mechanical properties changed with heat treatments. It was observed that heat treatment has a great effect to increase hardness of AlSi10Mg. According to Optic Microscope (OM) analysis it can seen formation of different phases.

Keywords: *aluminum, definition, thermal analysis, heat treatment, hardness, etc.*

✉ *Corresponding Author Email : afrim.osmani@umib.net*

Abs. No: 23

Dear authors,

Afrim Osmani, Muharrem Zabeli and Bastri Zeka

I am pleased to inform you that your paper detailed below has been accepted after peer review processes for presentation in ICCESEN-2023 and it will be published in abstract book. The conference will be taken place in Kemer-Antalya (TURKEY) during the period of 27-30 October 2023.
I thank you very much for your interest to ICCESEN and I look forward to see you in Kemer-Antalya-TURKEY.

Title: Recycling of lead from secondary materials in the Trepça complex in Mitrovica

Theme: 6
Abstract No: 23

Presentation type: oral

Sincerely yours,

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)

27-30 October 2023, ANTALYA -TURKEY

Abs. No: 27

Research of the possibilities of reducing the quantity of CO_2 in the premises of the E&E Foundry in Gjakove

Zarife BAJRAKTARI GASHI, Izet IBRAHIMI ✉

University "Isa Boletin" of Mitrovica, Faculty of Geoscience, Department Materials of Metallurgy, 40.000Mitrovica, THE REPUBLIC OF KOSOVO.

ABSTRACT

The research has to do with the impact of CO recovery through fryers in the scrap melting area in the " Foundry E&E " in Gjakovë. As a result of metallurgical production all over the world, we also have the production of large amounts of CO2 and CO in the working atmospheres of metals and alloys, but even larger amounts in the emission of gases, especially those metallurgical industries that operate without protective filters. The cupola furnace is the common furnace used for melting cast iron and the oldest type of furnace used in foundries. It is a cylindrical shaft-type furnace lined with refractory material. The furnace uses coke as fuel and combustion air. Molten iron flows down the cupola furnace while the combustion gases move upward leaving the furnace through its stack. As melting proceeds, new material is added to the top of the shaft through a loading door. At Foundry E&E, a total of 7,800 kg of pig iron is produced during one scrap smelting. Measurements of process gases in the working spaces and in the chimney exceed the standard values of CO2 and CO quantities. We performed the measurements with the "aeoroqualo-gassensing" series 500 apparatus. The amount of CO2 near the scarp melting cupola furnace was 325 ppm, while the amount of CO2 in the chimney reached the value of 2047 ppm. The aim of the work is to achieve the reduction of metallurgical coke, and the return of the process gas through the blowers in the areas of the cupola furnace in the Foundry E&E, and with this we will achieve the reduction of CO2.

Keywords: *Cast iron, CO2 , Foundry.*

✉ *Corresponding Author Email : Izet.ibrahimi@umib.net :*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)

27-30 October 2023, ANTALYA -TURKEY

Abs. No: 29

Comparative Study of Fuzzy Logic and Perturbation and Observation MPPT Algorithms for Photovoltaic System Optimization

Lakhdar BOURAS ✉, Tahar BOUKRA, Bilel AYACHI

University 20 Aout1955-Skikda, LES Laboratory, Department of Electrical Engineering, BP. 26, 21000, Skikda, ALGERIA

ABSTRACT

This work consists of the description and modeling of a photovoltaic system, it consists of a generator (PV) associated with an elevating chopper connected to a resistive load. An important feature of solar panels is that the maximum available power is provided only in a single operating point defined by a known voltage and current, called the maximum power point. In addition, the position of this point is not fixed but it moves according to the irradiation and temperature of the solar cells as well as the charge used. To extract the maximum power from the solar panels, we need to use a tracking mechanism from this point so that the maximum power is generated permanently what is known as the MPPT command «The maximum power point tracking», for this purpose, we have made a comparative study between the following Maximum Power Point Search (MPPT) algorithms: Fuzzy Logic (FL) and Perturbation and Observation (P&O) algorithm. The simulation results obtained under Matlab/Simulink show the control performance in the dynamic behavior of photovoltaic systems.

Keywords: Photovoltaic, boost converter, MPPT control, Modelling, Simulation ,Fuzzy logic

✉ *Corresponding Author Email : l.bouras@univ-skikda.dz*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)
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Abs. No: 31

Tracking Trajectory In Fractional Adaptive Control: Application To Scara Robot

Tahar BOUKRA[1] ✉, Bilel AYACHI[1], Yassine BENSAFIA[2]
[1] *Laboratoire Electrotechnique Skikda – LES, Université 20 Août 1955 Skikda, ALGERIA*
[2] *Département Génie Electrique, Université Akli Mohand Oulhadj, Bouira, ALGERIA.*

ABSTRACT

Recent years have seen a resounding interest in the concept of applying fractional calculus to systems in adaptive control, a concept that has gained a lot of popularity. As a result of the performance offered by such systems, there are many benefits to be gained. The present paper proposes a fractional model reference adaptive control (FMRAC) solution to reduce the delay time and overshoot that are present in classical control approaches. For the purpose of comparison between MRAC and FMRAC, a tracking trajectory application was developed for the SCARA robot. There have been interesting results in reducing the delay time and the overshoot, substantiating the claims that have so far been made regarding this application.

Keywords: *approximation methods, fractional adaptive control, MRAC, SCARA robot*

✉ *Corresponding Author Email : t.boukra@univ-skikda.dz*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)
27-30 October 2023, ANTALYA -TURKEY

Abs. No: 35

Physical Characteristics Of Some Materials Used For Dental Braces

Dhuratë SYLA-HASANI[1], Naim SYLA[2] ✉
[1]Tridont-Dhëmbi, Str. Ali Vitia, 10000 Prishtinë, KOSOVA
[2]University of Prishtina, FMNS, Department of Physics, Str. Eqrem Çabej, p.n. 10000 Prishtinë, KOSOVA

ABSTRACT

The main materials used for dental braces are: metals, sapphire, ceramics and their combination. Depending on the type of braces, the material is also used. In this contribution, we will reveal the physical characteristics of the main metallic and non-metallic materials that braces are made of. As an example, we will bring the physical characteristics of some various metals and alloys are used in the production of braces: titanium, stainless steel, gold, chrome as well as sapphire and ceramics. The main physical characteristics of materials are: their density, strength, durability, elasticity and workability. In addition to the physical characteristics, we will present the approximate costs of the different types of braces and thus we will have a clearer picture of their selection.

Keywords: *braces, metal, alloys, sapphire, ceramics.*

✉ *Corresponding Author Email : naim.syla@uni-pr.edu*

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27-30 October 2023, ANTALYA -TURKEY

Abs. No: 38

FE Modeling Of Shock Waves

Naim SYLA[1] Fisnik ALIAJ[1], Bashkim DALIPI[2] ✉, Arbër ZEQIRAJ[3], Dhuratë SYLA–HASANI[4]

[1]*University of Prishtina, FMNS, Department of Physics, Str. Eqrem Çabej, p.n. 10000 Prishtinë, KOSOVO*

[2]*University "Kadri Zeka", Faculty of Education, Zija Shemsiu Str.nn, 60000 Gjilan – KOSOVO*

[3]*University of Mitrovica, Department of Materials and Metallurgy, PIM-Trepça, KOSOVA*

[4]*Tridont-Dhëmbi, Str. Ali Vitia, 10000 Prishtinë, KOSOVA*

ABSTRACT

Among the well-known methods in medicine is the application of mechanical waves, as well as ultrasound and shock wave methods. It is known that the characteristics of mechanical waves are determined by amplitude and frequency. If the frequency of the wave is above 20000Hz, then it cannot be heard by the human ear. These waves are called ultrasound. The basic principle of ultrasound application in medicine is that different tissues or foreign bodies (eg. stones) reflect ultrasound waves differently. In ultrasonography, reflected ultrasound waves are recorded by transducers and translated into a recorded image. On the other hand, if the mechanical wave propagates through a medium with a speed greater than the speed of sound propagated through that medium, then we have the shock wave. In this case, the waves produce an instantaneous increase in pressure or energy for very short intervals of time. These energetic impulses are usually applied in medicine to break kidney stones or urinary channels stones. The basic principle of the application is to focus the energy impulse of the wave on the places where the stones are found and hit them. During shock, the stones are broken and these can come out through the urinary channels. Such a method is called lithotripsy, while the device is called a lithotripter. In this contribution, we modelled the shock waves according to the FE method, while the simulation was done in the ANSYS application.

Keywords: *wave, mechanical, shock, stone, lithotripter.*

✉ *Corresponding Author Email : bashkim.dalipi@uni-gjilan.net*

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27-30 October 2023, ANTALYA -TURKEY

Abs. No: 39

A Hybrid Learning Device to study the light waves interference. What is the impact on the students' conceptual understanding?

Dalila YAMANI ✉
Laboratory of Didactic Of Sciences, Ecole Normale Supérieure (ENS) de Kouba, Physics Department, Algiers- ALGERIA

ABSTRACT

Following the online learning and teaching' experience during the Covid 19 pandemic, we are witnessing a strong trend towards the use of hybrid courses according to the idea that they are more flexible and offer the advantages of both online and face-to-face learning. In the scientific literature, we can find different hybrid courses' forms, and in order to use the appropriate one with regard to the characteristics of the teaching/learning context, and which allows a better conceptual understanding, a good mastery of this teaching/learning mode' devices is required. In this paper, we present a hybrid learning device that we designed and tested with a group of students at the Teachers' College of Kouba (ENS) in Algiers. The course focused on the light waves interference phenomenon and its related concepts. An experimental and a control group were used to investigate the difference in the conceptual understanding. The experimental group consisted of 36 students who experienced a hybrid "Ecosystem" learning-based device, using multiple technological resources and an open educational approach. While the control group consisted of 35 students which used traditional face-to-face learning.

The findings show that students in the experimental group outperformed their counterparts in terms of conceptual understanding level, and this outperformance is statistically significant. The pedagogical openness of the hybrid learning device and its articulation between the face- to-face and the distance phases, as well as the diversity of the technological support, seem to be relevant characteristics to improve the students' conceptual understanding.

Keywords: *Hybrid learning device, Light waves interference, Conceptual understanding*

✉ *Corresponding Author Email : yamani19@gmail.com*

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Abs. No: 40

Synthesis and Anticoagulant Activity of the Synthetic Coumarin Derivatives

Arben HAZIRI[1] ✉, Ilir MAZREKU[2], Ilirjana OSMANI[1], Ibrahim RUDHANI[3]
[1] Prishtina University, Chemistry Department, Prishtina-KOSOVA
[2] Prishtina University, Biology Department, Prishtina-KOSOVA,
[3] Prishtina University, Department of Intern Medicine and Nephrology, Prishtina-KOSOVA

ABSTRACT

The main purpose of this study was to report the synthesis of some coumarin-type derivatives. The structure of the synthesized compounds has been verified on the basis of literature data and spectroscopic measurements such as NMR, MS and IR. In addition, there were two objectives for the study: first, to test these synthetic derivatives in vivo for their anticoagulant effects in the laboratory male mice (Mus musculus swiss albino). Second, to compare between the in vivo activity of these synthetic derivatives and that of warfarin (CAS 81-81-2), which is the most commonly used anticoagulant. Prothrombin time (PT) was used as the value to compare the anticoagulant properties of the synthesized compounds and warfarin. Results of this study revealed that the most potent compound of the synthesized derivatives was compound 5, which shows higher anticoagulant activity (PT(s) 19.60) than warfarin (PT(s) 14.60). However, Anticoagulant activity was also associated with toxicity by the all synthesized compounds. Synthesized coumarins are potentially antithrombotic drug candidates for further elaboration. Compounds 4 and 5 need to be further tested for the side effects so that they can be introduced into clinical trials.

Keywords: *Coumarine derivatives, Hyroxycoumarin, Warfarin, Anticoagulant activity*

✉ *Corresponding Author Email : arben.haziri@uni-pr.edu*

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27-30 October 2023, ANTALYA -TURKEY

Abs. No: 42

Hypoeutectoid Grey Cast İron For Brickyard İndustry Application

Mohamed HABIRECHE[1,2], Nacer Eddine BACHA[2] ✉

[1]University of Medea, Lab. of mechanics, physics, and mathematical modelling , Mechanical Department, Medea, ALGERIA

[2] university of Blida 1, Lab. Of Surface Treatment & Materials, Mechanical dept., Blida 9000, ALGERIA,

ABSTRACT

In brickyard industry, smooth roll crusher is the most critical component in the brick production process. The main damage to the surface of the roll crusher comes from abrasion wear. Grey cast iron with a CE around 4.0 was chosen for the manufacture of these rolls crushers. Castings with various compositions in the basic Class 25 grey cast iron, were cast with the combined effects of copper and chromium to study their effects on their castability, mechanical properties and wear. The casting parts were heated to 900°C for and quenched with forced air. Optical metallography, chemical analyses, Brinell hardness and Vickers microhardness, tensile tests and wear tests were used to characterize the ingots cast. All the cast irons made were hypoeutectoid with a microstructure consisting mainly of class A type graphite in a pearlitic matrix. The sensitivity of cast iron to the mass effect has been greatly reduced by appropriate and economical additions of copper and chromium. Normalization treatment, high cooling rate through the eutectoid transformation temperature interval and additions of Cu and Cr promote the formation of a finer and harder pearlite. All these factors contribute to increase the strength and hardness of alloyed hypoeutectic grey cast iron. The results showed that the quenched and tempered alloys had best wear resistance at 400°C for alloyed grey cast iron (containing 0.62%Mn, 0.37%Cr, 1.21% Cu and 0.12%Mo).

Keywords: *Cast iron; hypoeutectoid cast iron; grey cast iron; Heat treatment; brickyard industry.*

✉ *Corresponding Author Email : bacnacer@gmail.com*

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27-30 October 2023, ANTALYA -TURKEY

Abs. No: 44

Nonlinear and non-stationary vibration signal analysis based on the Fourier Decomposition Method

Mohamed REBIAI ✉, Billel BENGHERBIA, Sid ahmed LACHENANI

Advenced electronic systems Labolartory, Dr. Yahıa Fares Unıversıty of Medea , faculty of technology, department of electrıcal engıneerıng, ALGERIA

ABSTRACT

Monitoring and maintenance of rotating machines by observing the vibration signal, occupies an important place in the industrial field. The bearing is the most failed part of rotating machine. All technique categories of signal processing are used for vibration signal processing, as time domain methods, frequency domain methods and time-frequency domain methods. Moreover, in the past two decade, various non stationary, non-linear and multi-component signal analysis methods are suggested to extract parameters for the vibration signals analysis of rotating machine. Therefore, the aim of this study is to include a newest time-frequency method named Fourier Decomposition Method "FDM" established by p. Singh and all, over three year ago, for bearing defect diagnosis. In addition, we applied the proposed method on vibration signal from faulty bearings collected by Case Western Reserve University (CWRU) bearing data center, for detection of the faults types. The main objective of Fourier decomposition method is the representation of the signal by small functions, constants and mono-components characterized by intrinsic frequency, termed Fourier Intrinsic Band Functions (FIBFs), these bands are zero mean and orthogonal functions, from there we can simply identify which bearing part is defective.

Keywords: *Fourier Decomposition Method, FIBFs, vibration signal, rotating machines, bearing faults diagnosis, cwru data set.*

✉ *Corresponding Author Email : rebiaimd@gmail.com*

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Abs. No: 46

Optimizing Defect Detection in Ball Bearings: A Robust Signal Filtering Approach with Dynamic FIR Filter Coefficients

Sid Ahmed LACHENANI ✉, Billel BENGHERBIA, Mohamed REBIAI, Ould Zmirli MOHAMED
Advenced electronic systems Labolartory, Dr. Yahıa Fares Unıversıty of Medea , faculty of technology, department of electrıcal engıneerıng, ALGERIA

ABSTRACT

Effective filtering techniques are essential as they allow us to extract relevant information from the raw signal measurements, enabling us to identify and analyze potential defects in ball bearings with greater precision. By optimizing the performance of the filtering process through the dynamic update of FIR filter coefficients, we aim to enhance the overall sensitivity and reliability of the defect detection system.

In this study, we have focused on the development of a robust signal filtering system for detecting defects in ball bearings, to enhance the accuracy of defect detection, we dynamically update the coefficients of the filter based on specific cases. Our approach involves utilizing a Finite Impulse Response (FIR) filter to process the raw signal measurements.

To implement our system, we employed the Vivado HLS software, which facilitated the transformation of the system specification written in C into a Register Transfer Level (RTL) implementation. This RTL design was then synthesized on an FPGA (Field Programmable Gate Array), leveraging the capabilities of Vivado HLS and integrating the necessary interfaces through IP integrator, our study offers valuable insights into the development of an effective and efficient system for detecting and analyzing defects in ball bearings.

Keywords: *Vivado HLS, Bearings, Filtre RIF coefficients*

✉ *Corresponding Author Email : sidahmed.lachenani@hotmail.com*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)

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Abs. No: 47

HPLC/DAD of polyphenolic compounds, antioxidant activity of Algerian Spirulina

Fahima ABDELLATIF[1] ✉, Dahmane DAHMANE[1], Mohammed MESSAOUDI [2]

[1] Laboratoire de Recherche sur les Produits Bioactifs et la Valorisation de la Biomasse, Ecole Normale Supérieure Kouba, Alger, Algérie. B.P. 92, Kouba Alger, ALGÉRIE

[2] Nuclear Research Centre of Birine, Djelfa, P.O. Box 180,17200 Ain Oussera, ALGERIA

ABSTRACT

In our work we studied the Spirulina planted is collected in Algeria, more precisely in Oran. The phenolic compounds of Spirulina were extracted based on three different organic solvents with a cold extraction for 48 hours. After the extraction we studied thin layer chromatography. Then we prepared samples of the extract for each solvent and the standards available in our research laboratory, in order to do the HPLC chromatographic analysis. The results of anlysis by HPLC/DAD were identified eight phenolic compound. Then we studied the antioxidant activity of the extract in DPPH test and comparing its inhibition rate with that of standard antioxidants. The results
showed that Spirulina has a high activity against free radicals, because it gives Ic_{50} values lower than those given by standard antioxidants.

Keywords: *Spirulina.; medicinal plants; polyphenolic compounds; HPLC/DAD; antioxidant activity.*

✉ *Corresponding Author Email : zina_fahima@yahoo.fr*

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Abs. No: 48

Study of the deconfinement phase transition with q-deformed algebra

Lebba GHENAM ✉

Ecole Normale Supérieure El-Cheik Mohamed El-Bachir El-Ibrahimi, Physics Department, BP 92, 16050, Vieux-Kouba, Algiers, ALGERIA

ABSTRACT

In our previous works, we examined the finite size for the thermal deconfinement phase transition (DPT) from a hadronic gas phase consisting of massive pions to a Quark-Gluon Plasma phase containing gluons, massless up and down quarks and massive strange quarks within the phase coexistence model and calculating mean value of some response functions, at vanishing chemical potential. In the present work, we re-examine these effects for the thermal DPT, but now within massless particles and using the q-statistics (q-deformed algebra) where the entire structure of thermodynamics is preserved if ordinary derivatives are replaced by an appropriate Jackson derivative, and the commutation-anticommutation relations are deformed. For this, we examine analytically the behavior of the most important thermodynamical quantities describing the system (energy density ε, order parameter h, … etc) with temperature T and the deformation parameter q at a vanishing chemical potential.

Keywords: *Quark-Gluon Plasma, q-deformed algebra, Jackson derivative*

✉ *Corresponding Author Email : lebba.ghenam@g.ens-kouba.dz*

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27-30 October 2023, ANTALYA -TURKEY

Abs. No: 50

In Silico Study Of Natural Inhibitors Of SARS-CoV-2 Using Molecular Docking And Molecular Dynamics

Rayenne DJEMIL[1] ✉, Mouna CHERIET[2], Bochra BENCHEIKH[1], Djamel Eddine KHATMI[3]

[1] Laboratory of Computational Chemistry and Nanostructures, University May 8, 1945, Guelma, ALGERIA

[2] Medicinal Plants Research Unit (URPM.3000, Laghouat) Attached to the Biotechnology Research Center (CRBt 25000, Constantine), Laghouat, ALGERIA

[3] Aix Marseille Univ., CNRS, Centrale Marseille, iSm2, Marseille, FRANCE.

ABSTRACT

In order to contribute to the fight against SARS-CoV-2, which has been controversial to date, we have studied the inhibition of this virus by several natural compounds using molecular docking and molecular dynamics. In the receptor-ligand systems studied, the SARS-CoV-2 receptor used as therapeutic targets is the Mpro protease (6LU7)). The ligands used as inhibitors are a series of flavonoids and coumarins with two drugs (CQ and HCQ) used as benchmarks. Docking results revealed that the inhibitory power of the natural ligands studied with the Mpro was significant. Molecular dynamics (MD) simulation has been performed to better understand the stability and dynamics of all complexes. Therefore, these natural molecules show promising candidates in the inhibition of SARS-CoV-2.

Keywords: *SARS-CoV-2 Mpro Inhibition Molecular Docking Molecular Dynamic Simulations*

✉ *Corresponding Author Email : messdjem@gmail.com, djemil.rayenne@univ-guelma.dz*

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27-30 October 2023, ANTALYA -TURKEY

Abs. No: 52

The study of the dielectric behavior of healthy and altered materials

Samia DERBİL[1,2] ✉
[1] *University of Sciences and Technology Houari Boumediene (USTHB), Department of Physics, Faculty of Sciences, BP 32, El-Alia, Bab Ezzouar 16111, ALGERIA*
[2] *Higher normal school of kouba Cheikh Mohamed El Bachir El-Ibrahimi BP N°92, vieux kouba 16308, ALGERIA*

ABSTRACT

Some weathered materials have different dielectric behaviors than those that are healthier, hence the help of making measurements on these types of materials (pure and irradiated). the control measurements are based on the determination of permittivity and conductivity of the media concerned.

Dielectric characterization of materials comes down to the study of the wave-matter interaction using the frequency method which makes it possible to calculate the dielectric constant of the materials analyzed. The experimental device that we used is based on the use of an impedance analyzer type HP4191A, operating on a frequency range from 1 Mhz to 1000 Mhz, it also contains a measurement cell consisting of a coaxial transmission line.

Our measurements are based on the characterization of a resin used in dental surgery as well as the evolution of its characteristic parameters. The results obtained showed that certain materials, this explains the high values of the imaginary part of the permittivity, obtained at low frequencies. On the other hand, the resin-hardener mixture have the same result as the pure resin, which could mean that the hardener lost its relaxation spectrum after mixing with the resin.

Keywords: *permittivity, conductivity, dielectric relaxation.*

✉ *Corresponding Author Email : samiaderbil@gmail.com*

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Abs. No: 53

Real Time Ultrasoft transverse Photons Self Energy at Next to-leading order in Hot Scalar QED

Karima BOUAKAZ[1] ✉, Amel YOUCEFI[1], Abdessamad ABADA[2]

[1] *Ecole Normale Supérieure, Department of Physics, Laboratoire de Physique des Particules et de Physique Statistique, Vieux-Kouba, Algiers, ALGERIA*

[2] *United Arab Emirates University, Department of Physics, P. O. B. 17551, Al Ain, UNITED ARAB EMIRATES*

ABSTRACT

We determine a compact analytic expression for the complete next-to-leading contribution to the retarded transverse photons self-energy in the context of hard-thermal-loop summed perturbation of massless quantum electrodynamics (QED) at high temperature to calculate the next-to-leading order dispersion relations for slow-moving transverse photons at high temperature scalar quantum electrodynamics (Scalar QED), using the real time formalism (RTF) in physical representation. We derive the analytic expressions of hard thermal loop (HTL) contributions to propagators and vertices to determine the expressions of the effective propagators and vertices in RTF that contribute to the complete next-to leading order contribution of retarded transverse photons self-energy.

Keywords: *Hard thermal loop, Hot Scalar QED, NLO Computations, Soft transverse photons*

✉ *Corresponding Author Email : kbouakaz@yahoo.fr, karima.bouakaz@g.ens-kouba.dz*

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Abs. No: 54

Handling of radioactive waste from the use of radionuclides in medicine in University Clinical Center of Kosovo

Besire CENA, Nazmi HASI ✉
University of Mitrovica "Isa Boletini", Faculty of Food Tehnology, Faculty of Geosciences, KOSOVO

ABSTRACT

The waste that is generated during the different applications of radionuclides in medicine is considered as biomedical radioactive waste. The overall goal of biomedical radioactive waste handling is to minimize the hazards posed by the waste prior to discharge or disposal. In order to plan the treatment of radionuclides in medical facilities, it is important to design an effective system for the overall management of radioactive biomedical waste. In this scientific paper I make a general assessment of the planning methods used in the handling of radioactive waste in medical facilities, including the collection, separation and packaging of radioactive biomedical waste.

Keywords: *radionuclides,radioactive biomedical waste,separation.*

✉ *Corresponding Author Email : nazmi.hasi@umib.net :*

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Abs. No: 57

Cyanide Removal from Aqueous Solution by Adsorption on Activated Alumina

Ahmed Reda YEDDOU[1] ✉, Salima CHERGUI[1], Farid HALET[2], Abderrahmane BOUTRIF[1], Abdelmalek CHERGUI[3], Boubekeur NADJEMI[1], Aissa OULD-DRİS[4]

[1] Laboratoire d'Etude et de Développement des Techniques de Traitement et d'Epuration des Eaux et de Gestion Environnementale – LEDTEGE, Department of Chemistry, Ecole Normale Supérieure Kouba, Kouba, Algiers, ALGERIA

[2] Université M'HAMED BOUGARA Boumedres, Department of Biology, Boumerdes, ALGERIA

[3] Ecole Nationale Polytechnique, Department of Environmental engineering, Alger, Algiers, ALGERIA

[4]Laboratoire de Transformations Intégrées de la Matière Renouvelable, EA 4297, Université de Technologie de Compiègne, Compiègne, FRANCE

ABSTRACT

Cyanide is considered one of the most dangerous compounds for the environment. They are discharged by various industries: chemical and metallurgical processes (extraction of gold and silver). Adsorption is among the most used processes for elimination of cyanides particularly for the low concentrations. In this work, the cyanide removal is carried out by adsorption on neutral activated alumina and activated alumina supported copper. The used adsorbents are characterized by scanning electron micrograph and by determination of the physicochemical properties and specific surface area. All the adsorption experiments were performed in batch mode on synthetic water cyanide (KCN) at pH 10.8–11.0 to avoid volatilization of very toxic HCN. To describe the adsorption kinetics, the kinetic models of pseudo-first-order, pseudo-second-order, and intra-particle diffusion were applied. The experimental equilibrium data for adsorption of free cyanide were analyzed by the Langmuir, Freundlich, and Temkin isotherm models.

For both adsorbents, the pseudo-first order kinetic model best described the experimental data with a high coefficient of determination and that the Langmuir isotherm model fitted better than the Freundlich and Temkin models. The maximum adsorption capacity) was 150 and 100 mg/g at 293 K for activated alumina supported copper and neutral activated alumina, respectively.

Keywords: *Activated alumina, Activated alumina supported copper, Cyanide, Removal, Adsorption*

✉ *Corresponding Author Email : aryeddou@yahoo.fr*

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Abs. No: 58

Planck's law and Einstein coefficients in Tsallis q- statistics

Embarka BOUTALBI[1,2] ✉, Leila AIT GOUGAM-TRIBECHE[2]

[1] Laboratory of Particle Physics and Statistical Physics, Ecole Normale Supérieure BP 92Vieux kouba, ALGERIA

[2] Theoretical Physics Laboratory, Faculty of Sciences-Physics, University of Bab-Ezzouar, U.S.T.H.B, B.P. 32, El-Alia, Algiers 16111, ALGERIA

ABSTRACT

In this paper, we propose to reconsider blackbody radiation within the theoretical framework of the q-statistics arising from the Tsallis entropy [1]. we have proposed an alternative generalization to the Planck law for blackbody radiation, using the counter part of the Bose-Einstein distribution in the Tsallis q statistics. The generalized Planck radiation law is presented and compared to the usual law, to which it reduces in the limiting case q→ 1. The so-called Einstein coefficients for emission and absorption are also reconsidered within the theoretical frame of the Tsallis q statistics. Interestingly, it is shown that the Tsallis statistics keeps unchanged the first Einstein coefficient while the second one admits a generalized form within the present theoretical framework.

Keywords: *Planck radiation, Tsallis q- statistics, Einstein coefficient.*

✉ *Corresponding Author Email : emboutalbi@yahoo.fr*

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Abs. No: 59

Preparation of Copper Impregnated Activated Carbon and its Use for Cyanide Removal in aqueous media

Salima CHERGUI[1]✉, Farid HALET[2], Abderrahmane BOUTRIF[1], Abdelmalek CHERGUI[3], Boubekeur NADJEMI[1], Ahmed Reda YEDDOU[1], Aissa OULD-DRİS[4]

[1] Laboratoire d'Etude et de Développement des Techniques de Traitement et d'Epuration des Eaux et de Gestion Environnementale – LEDTEGE, Department of Chemistry, Ecole Normale Supérieure Kouba, Kouba, Algiers, ALGERIA

[2] Université M'HAMED BOUGARA Boumedres, Department of Biology, Boumerdes, ALGERIA

[3] Ecole Nationale Polytechnique, Department of Environmental engineering, Alger, Algiers, ALGERIA

[4]Laboratoire de Transformations Intégrées de la Matière Renouvelable, EA 4297, Université de Technologie de Compiègne, Compiègne, FRANCE

ABSTRACT

In this study, granular activated carbon was impregnated with copper (Cu2+) and used for the removal of very toxic cyanide by adsorption in aqueous solution. The impregnation is carried out by pore volume impregnation method using an aqueous copper(II) nitrate solution Cu(NO3)2, 3H2O, followed by drying during 12 h in air at 50 °C, then at 110 °C during 12 h and finally by calcinating in Argon at 250 °C during 2 h. The metal loading in the activated carbon is determined by the concentration of the copper nitrate solution which is used in the impregnation. The prepared impregnated activated carbon (identified by AC-Cu) contains 5 wt.% of Cu.

The AC-Cu was characterized by the determination of the specific surface area, X-ray diffraction (XRD), and by the physico-chemical properties. The second part focused on the study of the kinetics and isotherms of adsorption of cyanide onto impregnated activated carbon.

The adsorption experiments were performed in batch mode on synthetic water cyanide (KCN) at pH 11 to avoid volatilization of very toxic HCN. The application of kinetic models of pseudo-first order, pseudo-second order and intra-particle diffusion was performed to describe the adsorption kinetics. Experimental equilibrium data for adsorption of free cyanide were analyzed by the Langmuir, Freundlich and Temkin isotherm models. A very interesting maximum cyanide adsorption capacity was obtained which is of the order of 180 mg/g.

Keywords: *Copper impregnated activated carbon, Cyanide, Removal, Adsorption*

✉ *Corresponding Author Email : salchergui@yahoo.fr*

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Application of peanut shells as low cost adsorbent for cationic dye adsorption

Farida HAMDACHE[1,2] ✉, Farid HALET[2], Ahmed Reda YEDDOU[2], Abdelmalek CHERGUI[2], Boubekeur NEDJMI[2]

[1] Ecole Normale Superieure de Kouba ; B P 92, Vieux Kouba, 16308, ALGERIA

[2] Laboratoire d''étude et de developpement des techniques d'épuration et de gestion environnementale LEDTEGE- ENS Kouba –B P 92, Vieux Kouba, 16308, ALGERIA

ABSTRACT

The main objective of this study is to investigate the possibility of using a lignocellulosic residue, peanut shells as a low cost adsorbent for the removal of methylene blue dye from aqueous solution. Adsorption experiments were conducted by varying parameters such as: pH, contact time and initial concentration of adsorbate. Results show that pH has no apparent effect on methylene blue adsorption. Modelling of kinetic experimental data was considered by applying pseudo first order, pseudo second order, and intraparticle diffusion. Also, modelling of isotherm is considered by applying Langmuir, Freundlich and Temkin models. The results of kinetic modelling showed that pseudo second order model fit well experimental data for all studied concentrations. In addition, the intraparticle diffusion is implicated in adsorption process, without being the sole mechanism that control adsorption. The results of isotherm modelling revealed that adsorption of methylene blue on peanut shells, is better described by the Langmuir model according to R2 and RMSE values. The Langmuir separation Factor (RL) and the Freundlich parameter (1/n) have both values under unity, indicated that the adsorption of methylene blue is very favourable. The ultimate adsorption capacity reached approximately 100 mg/g. these results show that peanut shells can be a potential adsorbent for the removal of organic dyes from aqueous solutions.

Keywords: *Adsorption, methylene blue, peanut shells, kinetic, isotherm.*

✉ *Corresponding Author Email : farida.halet@g.ens-kouba.dz*

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Abs. No: 62

Elimination of methylene blue dye in aqueous solution by ultraviolet (UV) radiation alone and in the presence of hydrogen peroxide

Farid HALET[1,2] ✉, Farida HAMDACHE[2], Saida BEKHTI[2], Salima CHERGUI[2], Ahmed Reda YEDDOU[2], Abdelmalek CHERGUI[2], Boubekeur NADJEMI[2]

[1] Department of Biology, University M'Hamed Bougara Boumerdes, Avenue de l' independence, Boumerdes 35000, ALGERIA

[2] Laboratoire d'étude et de developpement des techniques d'épuration et de gestion environnementale LEDTEGE– ENS Kouba – B.P.92, Vieux-Kouba, 16308, ALGERIA

ABSTRACT

UV radiation can be combined with other materials and used for the advanced oxidation of pollutants in water. The combination of this radiation with H2O2 in water treatment processes enables the production of hydroxyl radicals known for their high reactivity in the oxidation of organic pollutants. The aim of this study is to remove methylene blue dye from a synthetic solution (BM), at different concentrations, using this radiation (UV) alone and in the presence of hydrogen peroxide (H2O2). An experimental set-up was set up in the laboratory. The UV source, with a dose of 210 J/m2, is placed in a quartz tube 25 mm in diameter and 200 mm long, and immersed in a closed tubular reactor with a reaction volume of 300 mL. The whole solution to be treated is recirculated thanks to a constant flow recirculation pump in a feeding tank which allows a batch operation. The study was carried out for two pH values = 4 and 9. The BM concentrations were 2, 5, 10, and, 20 mg/L, and the molar ratio [H2O2]/[BM] was 1, 1.5, 2, and 3. The results obtained show a 98% abatement of the initial BM concentration after 2 min of reaction. The study of oxidation kinetics follows the pseudo-first-order model.

Keywords: *Methylene blue, Advanced oxidation processes (AOP), Ultraviolet UV, Hydrogen peroxide (H2O2)*

✉ *Corresponding Author Email : f.halet@univ-boumerdes.dz*

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Abs. No: 65

Electrodeposited Cu_2O on GC and its application for electro-oxidation of MB

Salima KAIZRA ✉

Laboratory of Electrochemistry-Corrosion, Metallurgy and Inorganic Chemistry, Faculty of Chemistry, U.S.T.H.B., BP 32 El-Alia, Algiers 16111, ALGERIA

ABSTRACT

Thin layer copper oxide (Cu2O) materials has attracted the attention of the scientific community; because of its excellent properties such as, good conductivity, low price, good electric contact and big electrode/electrolyte interface. In the present work, we first deposited a thin layer of Cu2O on Glassy carbon (GC) substrate using electrochemical technique. Then, we tested its electroanalytical performance. The X-ray diffraction analysis showed the formation of an copper oxide (Cu2O) layer with a cubic structure and space group of Pn3$\bar{}$m. The Synthesized of Cu2O is used as a electro catalyst methylene blue dye degradation. The high oxygen ($\eta O2 = 0.6V$) overload allows it to be excellent for electrode -gradation, pH =7 , 25°C temperature, 2.8V/ECS applied voltage and 30 min electrolysis, Cu2O was utilized to degrade 90% of MB (10 mg /L) via an electrochemical technique. Pseudo-first order kinetics governed the electrochemical degradation.

Keywords: *Cupric oxide , thin film , MB dye , electro-oxidation*

✉ *Corresponding Author Email : salima.kaizra@g.ens-kouba.dz :*

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Abs. No: 66

Design and implementation of an Edge AI solution for bearing monitoring and fault diagnosis in centrifugal pumps

Samir CHADLI[1,2]✉, Billel BENGHERBIA[1,3], Abdelhafid TOBBAL[1,3], Sid Ahmed LACHENANI[1,3], Fouad TCHOKETCH KEBIR[1], Abderrahmane KEROUCHE[1]

[1] Yahia Farès University of Medea, Faculty of Technology, Department of Electrical Engineering, Pôle urbain, Medea, 26000, ALGERIA.

[2] Laboratory of Instrumentation (LINS), University of Science and Technology Houari Boumediene (USTHB), Bab Ezzouar, Algiers, 16111, ALGERIA

[3] Laboratory of Advanced Electronics Systems, Medea University, Electrical Engineering Department, Pôle urbain, Medea, 26000, ALGERIA

ABSTRACT

Centrifugal pumps are among the most commonly used types of pumps in agriculture and industrial applications, as they are designed in a way to guarantee high efficiency, simple use and maintenance. The bearings which are a basic element of these pumps are one of the most stressed components and represent a frequent source of pumps' failure. The defects that can be encountered are : flaking, abrasion, corrosion, etc. In the majority of the cases, the degradation results in a spalling of one of the races or of a rolling element of the bearing, which subsequently leads to the failure of the pump. For this, it is of great importance to ensure the monitoring of these bearings.

This work presents a solution to solve these problems by the development of an edge device for early bearing's fault diagnosis based on acoustic signals. In this solution, the MFCC method is implemented on a Raspberry Pi 3 Model B board based on a quad Core microprocessor (Broadcom BCM2837 64-bit up to 1.2 GHz) with a RAM memory of 1GB. To detect and diagnose bearing's faults, MFCC is used as pre-processing method to convert the collected data into 2D feature representations, which are then utilised for fault prediction based on optimised CNN network architecture. The Raspberry Pi 3 board integrate a Wi-Fi and Bluetooth Low Energy interfaces which makes it possible to develop IOT preventive maintenance applications.

Keywords: *Bearing fault diagnosis, Centrifugal pumps, Convolutional neural network, IOT, MFCC, Preventive maintenance.*

✉ *Corresponding Author Email : chadli.samir@univ-medea.dz ; chadli_samir@yahoo.fr*

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Abs. No: 69

Environmental Properties of Spartium junceum Fibers Reinforced Poly (lactic acid) Composites.

Sorya NEKKAA ✉, Meriem BEDREDDINE, Melia GUESSOUM

Laboratoire Physico-Chimie des Hauts Polymères, Département de Génie des Procédés, Faculté de Technologie, Université Sétif 1, 19000. ALGERIA

ABSTRACT

Natural fibers are environment-friendly, lightweight, low-cost, and available when compared to synthetic fibers. These features enabled them to be established as a key component in polymers reinforcement and many other industrial applications, such as automotive and packaging. Currently, poly (lactic acid) (PLA) is one of the most interesting bio-based biodegradable thermoplastics, due to its high mechanical properties and good processability, and could be regarded as the most adequate substitute for petrochemical polymers. However, its brittleness, poor thermal resistance and limited gas and moisture barrier properties restrict its wide spread applicability. Thus, PLA has been modified according to several ways through blending with other synthetic or natural polymers or compounding with micro- or nano-fillers to induce or modify specific properties depending on the application. The strategy of incorporating natural fibers into a PLA matrix is particularly attractive since it provides a new way to produce low cost biodegradable bio-based composites. The main aim of this work was to study the environmental properties of poly (lactic acid)/ Spartium junceum (PLA/Sj) composites. The study of environmental properties showed that the rate of water absorption depends on time and the percentage of Sj fibers in biocomposites. Fiber treatment was a significant contribution to reducing the rate of water absorption. Evaluation of biodegradation by soil burial also revealed a certain resistance after treatment.

Keywords: *Composites, Chemical modification, Spartium Junceum fibers.*

✉ *Corresponding Author Email : s_nekkaa@yahoo.fr*

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Abs. No: 71

Copper intercalated montmorillonite reinforced polypropylene/ poly(lactic acid) (PP/PLA) blend nanocomposite : study of environmental properties and biocidal activity

Melia GUESSOUM ✉, Farida BOUZIDI, Sorya NEKKAA
Ferhat ABBAS Sétif 1 University, Processes Engineering Department, Faculty of Technology, Sétif – ALGERIA

ABSTRACT

Copper ions, either alone or in copper complexes, have an intrinsic antimicrobial effect on bacteria, viruses and fungi and so they have been used for centuries to disinfect liquids, solids, and many other materials. Now, copper is used as a water purifier, algaecide, fungicide, nematocide, molluscicide, and antibacterial and antifouling agent. Accordingly, it is assumed that introducing copper into materials would provide them with biocidal properties. Our work deals with the modification of montmorillonite (MMT) by the insertion of copper ions (Cu2+) into its interfoliar space to confer to the mineral biocidal activity then its use to prepare antibacterial packaging. For this, composite systems based on polypropylene (PP), poly (lactic acid) (PLA) and their blends PP/PLA at different concentrations of modified montmorillonite MMT-Cu2+ are prepared. The evolution of environmental properties such as water absorption and permeability to water vapor pointed out the high aptitude of MMT to absorb water due to its lamellar structure. However, the hydrophobic PP increased water resistance of the matrix, especially in presence of maleic anhydride grafted PP (PP-g-MA) used as a compatibilizer. Moreover, it was observed that the incorporation of MMT-Cu2+ into PLA and (50/50) PP/PLA blend has promoted their biodegradability and ensured an important antimicrobial activity. The use of films based on PP, PLA and PP/PLA blend and MMT-Cu2+ confirmed the biocidal activity of copper intercaled ions to provide a longer conservation period for the packed product by reducing bacteria proliferation.

Keywords: *Montmorillonite, Copper, Biocidal activity, Biodegradation, Water absorption*

✉ *Corresponding Author Email : guessoum_melia@yahoo.fr/ guessoum@univ-setif.dz*

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Cyanide Removal in aqueous solution by hydrogen peroxide oxidation in presence of heterogeneous catalysts

Abdelmalek CHERGUI[1,2]✉, Farid HALET[1,3], Salima CHERGUI[1], Boubekeur NADJEMI[1], Ahmed Reda YEDDOU[1], Aissa OULD-DRIS[4]

[1] Laboratoire d'Etude et de Développement des Techniques de Traitement et d'Epuration des Eaux et de Gestion Environnementale – LEDTEGE, Department of Chemistry, Ecole Normale Supérieure Kouba, Kouba, Algiers, ALGERIA

[2] Laboratoire LSTE, Ecole Nationale Polytechnique, Department of Environmental engineering, Alger, Algiers, ALGERIA

[3] Université M'HAMED BOUGARA Boumedres, Department of Biology, Boumerdes, ALGERIA

[4]Laboratoire de Transformations Intégrées de la Matière Renouvelable, EA 4297, Université de Technologie de Compiègne, Compiègne, FRANCE

ABSTRACT

Cyanides are considered to be highly hazardous compounds for the environment. They are discharged by various industries, particularly during metallurgical processes, plating, and surface finishing.

In this study, cyanide removal is performed through oxidation using hydrogen peroxide in the presence of heterogeneous catalysts. The catalysts used are activated alumina (Al2O3), and copper (II)-impregnated alumina (Al-Cu). Hydrogen peroxide is an interesting oxidant because it does not produce dangerous intermediate products and does not introduce additional salts into the water. The effects of initial cyanide concentration, catalyst concentration, temperature, and oxidant concentration are examined.

Overall, the catalysts employed have demonstrated improved performance and enhanced cyanide removal kinetics compared to oxidation without a catalyst. The rate of cyanide removal increases with higher initial cyanide concentration, oxidant concentration, and catalyst dosage in each case studied. Temperature elevation has shown positive effects on both catalysts.

The reaction kinetics was investigated using first-order and second-order models. The apparent rate constants and activation energies were determined.

The studied catalysts can constitute a good alternative to the oxidation in homogeneous catalysis.

Keywords: *Cyanide, Removal, Oxidation, Hydrogen Peroxide, Copper, Heterogeneous Catalysts*

✉ *Corresponding Author Email : a_chergui@yahoo.fr*

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Abs. No: 73

Identification of fouling mechanism and degradation of RO membranes using real DATA: Case study

Saida BEKHTI[1]✉, Mohamed BELKACEM[2], Farid HALET[1], Ahmed Réda YEDDOU[1], Boubekeur NADJEMI[1]

[1] Ecole Normale Supérieure Kouba, Laboratoire d'Etude et de Développement des Techniques de Traitement et d'Epuration des Eaux et de Gestion Environnementale – LEDTEGE Bp 92, Algiers 16050, ALGERIA.

[2] University of Science and Technology Houari Boumediene, Department of Process Engineering and Environment, PO BOX 32 El Alia 16111 Algiers, ALGERIA

ABSTRACT

This paper focuses on fouling and degradation phenomena of RO membranes operating at full scale during groundwater treatment in a beverage industry. A polyamide thin film composite RO membranes mounted in two stages and operating with partial recirculation of concentrate was followed up during four years of operation.

First, a fouling study was carried out by following up the variation of permeate flux and the pressure drop over several cycle of operation.

Second, an investigation study was considered to identify the predominant fouling mechanism occuring during pure water production by means of Langelier Saturation Index "LSI" measurements as well as RO membranes relative resistance assessment and bacterial enumeration curves analysis with foulant deposit characteristics.

Third, ageing assessment of RO membranes was considered. Indeed, significant increase in permeate flux associated with a rapid increase of salinity and decline in membrane resistance suggested an ageing and a degradation of the active layer.

Finally, Scanning Electron Microscopy with EDX analysis and X-rays diffraction were used to characterize the composition of the foulant deposit after the RO membranes destructive analysis. EDX analysis showed that the major elements found in the deposit layer are O, C and Ca followed by small amounts of other mineral elements.

The degradation of the active layer of RO membrane was highlighted by SEM analysis of a worn membrane sample which chows clearly apparent hollows "pores" of 10 µm of diameters.

Keywords: Reverse osmosis membranes, Fouling mechanism, Ageing, Degradation.

✉ *Corresponding Author Email : bekhtisaidaourabah@gmail.com.*

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Abs. No: 74

Comparing methods of extracting essential oils from citrus plants.

Leila BOUTEMTAM ✉, Mohamed Amine FERHAT

Laboratory of Research on Bio-active Products and Valorization of Biomasse. Ecole Normale Supérieure Vieux Kouba 16050. Alger. ALGERIA

ABSTRACT

The main objective of this work was to study a new microwave-assisted essential oil distillation process (ESSAM) and apply it to citrus varieties. Our goal was to improve this new system while reducing extraction times, simplifying operating protocols and developing an essential oil extraction technique applicable in particular to citrus fruits and all types of plants. The comparison of the yields of essential oil extracted by ESSAM with the cold expression and the hydrodistillation of citrus essential oils has made it possible to highlight differences in behavior depending on the nature of the matrix. Indeed, ESSAM is really more efficient, the yield of essential oil extraction obtained by the hydrodistillation method was 0.21% within 180 minutes, and by ESSAM method 0.24% within 30 minutes. A new approach for the extraction of essential oils from dry aromatic matrices and without the addition of steam water or solvent has applied to the extraction of essential oils from citrus peels. ESSAM procedures allowing a considerable saving of time and energy and the reduction of the rejections.

Keywords: *Citrus, peels, Essential oil, Microwaves, SFME, GC/MS*

✉ *Corresponding Author Email : leila.boutemtam@g.ens-kouba.dz, mohamedamine.ferhat@g.ens-kouba.dz*

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Influence of the annealing temperature on the magnetic and structural properties of nanostructured FeNi alloys

Abderrahamne YOUNES[1] ✉, Rachid AMRAOUI[1], Nacer DILMI[2] , Abderahim ABADA[3]

[1] Research Center in Industrial Technologies (CRTI), Cheraga 16014, Algiers, ALGERIA

[2] Center For Development of Advanced Technologies, 20 Aout 1956, Baba Hassan, Algiers, ALGERIA

[3] Laboratory of aeronautic science, Aeronautic institute, University of Saad Dahleb Blida, ALGERIA

ABSTRACT

This study aims to investigate the influence of annealing temperature on both the magnetic and structural properties of FeNi nanostructured alloys. The alloys were fabricated through the high-energy ball milling technique, and their magnetic and structural characteristics were assessed using X-ray diffraction and vibrating sample magnetometry. The results revealed a notable reduction in the saturation magnetization, coercivity, and remanence magnetization of the alloys with increasing annealing temperature. Specifically, the saturation magnetization decreased from 48.84 to 10.35 emu/g, coercivity decreased from 94.97 to 32.49 Oe, and remanence magnetization decreased from 1.69 to 0.027 emu/g. These findings highlight the significant impact of precise annealing temperature control on the magnetic and structural properties of nanostructured FeNi alloys, thereby showcasing their potential utility in various technological applications.

Keywords: *Nanostructured FeNi alloys, Annealing temperature, magnetic properties, structural properties.*

✉ *Corresponding Author Email : younesabdo11@gmail.com*

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Optimal conditions for Continuous Hot-Dip Galvanizing steel sheet

Mimoza KOVACI AZEMI, Zarife BAJRAKTARI GASHI ✉
University "Isa Boletini", Materials and Metallurgy Department, Mitrovice- KOSOVO

ABSTRACT

The research paper focuses on the importance of controlling the dew point in continuous hot-dip galvanizing to achieve a high quality zinc coating on steel sheets. The dew point is crucial because inadequate values can lead to condensation of humidity on the galvanized surface, resulting in uncoated areas that are prone to corrosion during the steel's service life. The results showed that altering the dew point values influenced the quality of the galvanized steel sheet surface. Higher dew point values correlated with increased humidity volume, leading to potential coating defects. To mitigate high dew point values, we increased the temperature in the furnace. This temperature increase helps to reduce the oxidizing ability of humidity. The study concluded that achieving lower dew point values resulted in a galvanized surface without defects. Such a surface exhibits improved durability against corrosion during material usage, leading to reduced costs.

Keywords: *dew point, galvanizing, steel, furnace, surface*

✉ *Corresponding Author Email : zarife.bajraktari-gashi@umib.net*

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Abs. No: 79

Theoretical Characterization Of C3h And C5h And Their Anions

Sara Chérifa BENNEDJAI[1,2], Dalila HAMMOUTÈNE[1], M.Luisa Senent DIEZ[3].

[1] Laboratory of Thermodynamics and Molecular Modeling, Faculty of Chemistry, USTHB, BP32, El Alia, 16111 Bab Ezzouar, Algiers, ALGERIA

[2] Ecole Normale Supérieure des Enseignants, Kouba, ALGERIA

[3] Instituto de Estructura de la Materia del Consejo Superior de Investigacions Cientificas, Madrid, SPAIN

ABSTRACT

Unsaturated carbon chains and hydrocarbons can play important roles in the chemical evolution of the interstellar sources. They can be considered as building blocks of large carbon species. Charged chains are reactive species that can participate in many chemical processes at low temperatures. We present state-of-the art ab initio calculations focused to the determination of equilibrium structures and spectroscopic parameters corresponding to various electronic states of the C5 H chains. The C5H and C3H radicals present various isomers that can be linear or cyclic forms. All of them show non-zero dipole moments that can help their identification. Some of them are relatively stable structures. Because, astronomers have dedicated special attention to the charged species during the last years, calculations on cations and anions are also provided. For all the cases, neutral, negative and positive charged species, excitations to the low electronic states are determined. We provide electron affinities and ionization potentials.

This work confirms the stability of the linear carbon chains and carbon clusters containing three-body rings. The C3H species, present three isomers.

The C5H species, present eight neutral isomers and eleven and ten isomers with a negative or a positive charge respectively. The equilibrium geometries, which can be candidates for laboratory and astrophysical detection, are studied using the RCCSD(T)-F12 and MRCI /CASSCF levels of theory, specifying properties for various electronic states. Four different stable isomers are confirmed for the C5H− anion. They are two rings and two chains, all showing singlet ground electronic states.

Keywords: *Astrochemistry, Interstellar medium, C5 H, C3 H, isomers, ab initio, spectroscopic properties, excited states.*

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Optimization of the ultrasound-assisted extraction of anthocyanins and total phenolic compounds in Hibiscus Sabdariffa L.

Habiba BOUKERCHE ✉, Nawel SAIDJI, Hind MOKRANE
Ecole Normale Superieure, B.P 92, Kouba, Algiers, Algeria University, Chemistry Department.Laboratoire de recherche sur les produits bioactifs et valorisation de la biomasse, ALGERIA

ABSTRACT

Roselle (Hibiscus Sabdariffa L.) has long been recognized as a source of natural food color additive. Ultrasonic-assisted extraction is green and innovative processes widely used for natural dyes extraction. For this purpose, this technique as well as conventional extraction were proposed to extract total monomeric anthocyanins and total phenolics from roselle flowers. Ultrasonic-assisted extraction for 5 min yielded total monomeric anthocyanins of 13.47□ □□0.22 mg/g and total phenolics of 163.23 □□□2.81 mg gallic acid/g of dried roselle flowers using 60% (V/V) aqueous ethanol and a solid/liquid ratio of 1/10 (g/mL). Conventional extraction required 24 h to obtain 14.46 □□□0.47 mg/g of total monomeric anthocyanins and 182.89 □□2.49 mg gallic acid/g of total phenolics.

Fourier transform infrared showed that all extraction procedures did not affect the structural properties of roselle anthocyanins. This study suggests the development of other green and innovative processes such as microwaves to improve the extraction of roselle pigments for potential application in food and non-food products.

Keywords: *Hibiscus sabdariffa L., Anthocyanin, Ultrasound-assisted extraction, Phenolic compounds.*

✉ *Corresponding Author Email : habiba.boukerche@g.ens-kouba.dz*

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Stability and degradation kinetics of anthocyanin

Nawel SAIDJI ✉, Habiba BOUKERCHE, Hind MOKRANE

Laboratoire de rechercher les produits bioactifs et la valorisation de la biomasse. Ecole Normale Superieure de Kouba BP 92 Vieux –Kouba- ALGERIA

ABSTRACT

Of all foods, few do not contain colorings. These add color and originality to the food and make it more attractive to consumers.

Natural dyes, most of which are of plant origin, form a very wide range of shades (from yellow to blue, green and even black). Anthcyanins, carotenoids, betalains and chlorophylls are among the most common dyes used in the food industry. Anthocyanins are responsible for the red, blue and purple coloring of many fruits, vegetables and flowers. These pigments are mainly derived from red fruits (grapes, strawberries, etc.) or vegetables (red cabbage, purple carrots, etc.), their coloring is very dependent on the acidity of the medium: it is red in an acid medium and blue in a neutral medium or alkaline.

In regulated doses, natural dyes are beneficial to health. Some of these dyes are known to have antioxidant, antimutagenic and anticarcinogenic activities.

In contrary to synthetic food dyes, which are industrially created by man, they are either exact copies of natural dyes or do not exist in nature. They have become more and more important and have ended up supplanting natural dyes. The latter are sensitive to several physico-chemical factors: temperature, light, pH, metal ions protected in their plant cell environment; once extracted, they become very unstable.

Keywords :*anthocyanins, degradation kinetic, stabilités..*

✉ *Corresponding Author Email : saidjinawel@hotmail.com*

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Electromagnetic and Mechanical Properties of Nanostructured Al-Ti alloys

Abderahim ABADA[1] ✉, Abderrahamne YOUNES[2], Rachid AMRAOUI[2]
[1] *Laboratory of aeronautic science, Aeronautic institute, University of Saad Dahleb Blida, ALGERIA*
[2] *Research Center in Industrial Technologies (CRTI), Cheraga 16014, Algiers, ALGERIA*

ABSTRACT

In this study, we synthesized Al-Ti alloys using a ball planetary mill with powdered Al and Ti components. After 24 hours of milling, the formation of the Al (Ti) solid solution was observed, and a crystalline size of 4 nm was achieved after 48 hours of milling. To investigate the electromagnetic behavior of the Al-Ti alloys during milling, we employed eddy current analysis, which allowed us to monitor the material's nanostructural state by analyzing its impedance diagram. Our results demonstrate that eddy current analysis is an effective method for assessing the electromagnetic properties of nanostructured Al-Ti alloys. Furthermore, we conducted micro-hardness tests to measure the alloys' mechanical properties. Interestingly, we found that the impedance and microhardness exhibited similar variations. This study highlights the successful synthesis and characterization of nanostructured Al-Ti alloys using a ball planetary mill. Our findings underscore the effectiveness of eddy current analysis in evaluating the electromagnetic properties of these alloys and propose a new approach to assess their mechanical properties. These insights provide valuable guidance for the design and development of customized nanostructured Al- Ti alloys for various applications.

Keywords: *Nanostructured AlTi alloys, Eddy current analysis, mechanical properties.*

✉ *Corresponding Author Email : abada_75@yahoo.fr*

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Magnetic and Structural Properties of Nanostructured AgFeO2 and CuFe2O4 Alloys

Rachid AMRAOUI[1,2] ✉, Abderrahmane YOUNES[1], Abderahim ABADA[3], Abdelkader AISSAT[4]

[1] Research Center in Industrial Technologies (CRTI), Cheraga 16014, Algiers, Algeria

[2] LATSI Laboratory, Department of Physics, Faculty of Science, University of Saad Dahleb Blida, ALGERIA

[3] Laboratory of Aeronautic science, Aeronautic Institute, University of Saad Dahleb Blida, ALGERIA

[4] LATSI Laboratory, Department of Electronics, Faculty of Science, University of Saad Dahleb Blida, ALGERIA

ABSTRACT

The objective of this article is to conduct a comprehensive comparative study on the magnetic and structural properties of the synthesized nanostructured CuFe2O4 and AgFeO2 alloys using the mechanical alloying technique. By exploring these properties, we aim to gain insights into the unique characteristics and potential applications of these two alloys. These alloys possess magnetic properties that can be tailored and optimized for a wide range of applications. Moreover, the impact of particle size and material composition on the magnetic characteristics of both alloys was investigated, aiming to comprehend the induced changes and explore their potential in future applications.The experimental findings indicate that CuFe2O4 exhibits higher saturation magnetization, coercivity, and remanence magnetization compared to AgFeO2. Specifically, the saturation magnetization increased significantly from approximately 0.14 emu/g to around 44.66 emu/g. Similarly, the coercivity increased from approximately 205.83 Oe to about 254.8 Oe, while the remanence magnetization rose from approximately 0.0067emu/g to approximately 15.82 emu/g.By elucidating the magnetic properties and the influence of particle size and material composition, this study sheds light on the potential utility of these nanostructured alloys in diverse applications. The simple and rapid synthesis method discussed in this article provides a valuable pathway for producing CuFe2O4 and AgFeO2 powders with tailored magnetic properties, thus paving the way for future advancements in this field.

Keywords: *Nanostructured AgFeO2 and CuFe2 O4 alloys, Magnetic properties, Structural properties.*

✉ *Corresponding Author Email : amrachid21@gmail.com*

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Moringa Extraction ultra sound method highest performance

Fatma Zohra FERRAHI ✉, Baya BERKA

ABSTRACT

In industrial applications, Moringa is considered as food plants with several medicinal uses. For anemia, constipation, diabets. This study wasinvetegated to evaluted the effect of extraction techniques such us maceration (DM) and utrasound in aqueous extraction of Moringa on the phenolic medium, theproperties of this bioactive substance , The extractobtained by ultasson method exhebited the highest performance

Keywords: *Moringa , Ultasound, maceration, extraction*

✉ *Corresponding Author Email : fatmazohra.ferrahi@g.ens-kouba.dz :*

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Characterization of the essential oils of lavandula stoechas And lavandula angustifolia from Algeria

Bahdja GUERFI[1], Nadia KHADER[2], Amina ZOUANI[3], H. BABOU[1], F. FARAH[1], Fatma Zohra HADJADJ AOUL[4]

[1] Medicinal Chemistry Laboratory , Faculty of Medicine, University Saad Dahlab of Blida 1. ALGERIA

[2] Biophysics laboratory, Faculty of Medicine, University Saad Dahlab of Blida 1. ALGERIA

[3] Toxicology laboratory, Faculty of Medicine, University Saad Dahlab of Blida 1. ALGERIA

[4] Medicinal Chemistry Laboratory, Faculty of Medicine, University Ben youcef Ben Khedda - Algiers. ALGERIA

ABSTRACT

BACKGROUND :

Essential oils are defined as the product of the distillation of a plant or part of the plant. They are substances of oily consistency , but without fatty acid, more or less fluid or retinoid, very odorous, volatile and often colored, their chemical composition is usually very complex.

In this study, we looked at the extraction and the characterization of the essential oils of two species of the genus Lavandula, native to Algeria.

METHODS :

Two spices belonging to the Lamiaceae family namely : « Lavandula stoechas » and « Lavandula angustifolia », have been histologically studied. Then extraction of their essential oils by hydrodistillation was carried out and the yields have been calculated.

Each essantial oil was characterized by its organoleptic characteristics (appearance, color and smell). Physicochemical characters (relative density, refractive index, acid index, saponification index, etc...) have been carried out according to AFNOR Standards.

RESULTS :

The results of the microscopic study show that the essantil oil of true lavender accumulates in secretory pockets and butterfly lavender EO accumulates in secretory hairs.

The flowering tops of « Lavandula stoechas » and « Lavandula angustifolia »provided rates of apppoximately : 1.17% and 3.9% respectively.

The determination of organoleptic and physicochemical characteristics gave results in accordance with the standards.

CONCLUSION :

The results obtained are satisfactory and deserve to be completed for the determination of the composition of the extracted species.

Keywords: *Essential oil, Lavandula stoechas , Lavandula angustifolia , hydrodistillation, characterization.*

✉ *Corresponding Author Email : bahdja.guerfi@gmail.com*

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Applications of Wavelet Transform for Analysis vibratory regime in series RLC circuit

Kenza ZAIBAK[1] ✉, Nora NAIT BOUDA[2], Fawzia MEKIDECHE-CHAFA[3]

[1] Laboratoire de Physique des Particules et Physique Statistique, Ecole Normale Supérieure, BP 92 Vieux Kouba, 16050 Algiers, ALGERIA

[2] Laboratoire de Mécanique des Fluides Théorique et Appliquée, Faculty of Physics, University of Sciences and Technology Houari Boumediene, Algiers, ALGERIA

[3] Laboratoire de Physique Théorique, Faculty of Physics, University of Sciences and Technology Houari Boumediene, Algiers, ALGERIA

ABSTRACT

The continuous wavelet transform (CWT) is a mathematical tool has been applied extensively in various fields such as compression, denoising data, image compression, and many more. The essentiel edge of this method over the Fourier transform is that it furnishes combined time and frequency localization, while in the Fourier transform only frequency information is available. This paper is concerned with applying the CWT for analysing the vibratory regime in series RLC circuit and determining the resonance frequency using Morlet wavelet.

Keywords: *Wavelet Transform, Morlet wavelet, Mexicain hat wavelet.*

✉ *Corresponding Author Email : kzaibak2@gmail.com*

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Crystal structure and quantum chemical DFT calculations of C,p- methoxyphenyl-N-phenyl nitrone

Karima BOUDHAR ✉, Mahdi DEBIECHE, Abdelhamid ZEGHDAOUI

Laboratoire N-corps et structure de la matière, Ecole Normale Supérieure. Kouba, B.P.92, 16050, vieux kouba, Algiers, ALGERIA

ABSTRACT

C,p-methoxyphenyl-N-phenyl nitrone (C14H13NO2) has been synthesized and characterized by single-crystal X-ray diffraction at 293 K. The title compound crystallized in the monoclinic system (P21/n space group) with Z = 4 and the following unit cell dimensions: a = 5.610 (2) Å, b = 16.965 (8) Å, c = 12.374 (6) Å. The structure of the this compound was optimized by density functional theory (DFT) using B3LYP method and shows that the calculated values obtained by B3LYP/6-31G(d,p) basis are in much better agreement with the experimental data than those obtained by B3LYP/6- 31G(d). The vibrational frequencies were evaluated using density functional theory (DFT) with the standard B3LYP/6-31G(d,p) basis.

Keywords: *X-Ray, methoxyphenyl, Vibrational frequencies, DFT calculations,*

✉ *Corresponding Author Email : boudhar_karima@yahoo.fr*

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Removal of Safranin by Direct Electrochemical Oxidation Method Using a β- PbO2 as Anode

Fatiha SMAILI ✉, Salima KAIZRA, Sabrina TABTI
Laboratory of Electrochemistry-Corrosion, Metallurgy and Inorganic Chemistry, Faculty of Chemistry, U.S.T.H.B., BP 32 El-Alia, Algiers 16111, ALGERIA.

ABSTRACT

Wastewater from textile activities often has a high polluting load of dyes that are difficult to biodegrade. Their treatment by traditional processes is ineffective, which has encouraged the search for other treatment techniques using powerful oxidation methods, such as the electrochemical oxidation technique, which is based on the generation of hydroxyl radicals (•OH) adsorbed on the surface of a high oxygen anode by oxidation of water in an acidic or neutral medium. Among these anodes, lead dioxide is frequently used in industry because of its excellent properties such as its chemical resistance in acidic or alkaline environments, its low cost compared to that of noble metals and especially the availability of lead in Algeria .In this work, the galvanic deposition of lead dioxide onto the Pb electrode was achieved by a potentiostatic process in a 0.5 mol/L sulfuric acid solution at 1.3 V/ECS for 30 min. The XRD results showed that the crystal structure of PbO2 in acidic solution was pure β- PbO2. The degradation of Safranin dye in 0.1 mol/L sodium sulfate aqueous solution was investigated by potentiostatic method using β-PbO2 as the anode. Safranin was successfully oxidized by hydroxyl radicals electrogenerated by oxidation of water on the Pb/β-PbO2 electrode surface. Anodization of Safranin followed pseudo-first-order kinetics. Time and applied potential had a significant effect on the electrochemical decomposition of Safranin at the Pb/β-PbO2 electrode.

Keywords: *Pb/PbO2 electrode, electrochemical oxidation, safranin, decontamination*

✉ *Corresponding Author Email : smailifatiha123@gmail.com*

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The Role of Alternative Experiments in Correcting Middle School Students' Misconceptions about the Boiling Concept in Algeria.

Zohra DOUADI✉

Ecole Normale Supérieure, Chemistry Department , Kouba-ALGERIA

ABSTRACT

This study aims to identify the alternative experiments' role in correcting middle school students' misconceptions about the boiling concept. The descriptive and experimental approaches were used, and the study was limited to a sample of second year middle school students in Algiers city. The control group consisted of (158 pupils) and the experimental group (20 pupils). The study tool consisted of a test that includes 20 multiple-choice questions, as well as the design of simple alternative experiments. Boiling subject was taught to the control group in the traditional way and to the experimental group using the alternative experiments. The results of the study showed that there are statistically significant differences at the level of significance ($\alpha \leq 0,05$) between the mean scores of the experimental group and the mean scores of the control group in the conceptual tests in favor of the experimental group due to the teaching method. Thus, the study recommends the adoption of alternative experiments in order to develop the educational process.

Keywords: *Misconceptions, Alternative experiments, Boiling Concept.*

✉ *Corresponding Author Email : zohra.douadi@g.ens-kouba.dz*

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Annealing effects on structural and luminescence properties of Tb3+-doped yttrium phosphovanadates Nanophosphor Synthesized by Sol-Gel Method

Ahlame MRAOUEFEL[1] ✉, Lakhdar GUERBOUS[2], Madjid DIAF[3]

[1] Blida-1 University, Physics Department, BP 270 Blida 09000 -ALGERIA

[2] Laser Department/ Nuclear Research Centre of Algeria (CRNA), 02, Boulevard Frantz Fanon, B.P. 399, Algiers, 16000- ALGERIA

[3] Laboratory of Laser Physics, Optical Spectroscopy and Optoelectronics (LAPLASO), Badji Mokhtar Annaba University, POB 12, 23000, Annaba, ALGERIA

ABSTRACT

Terbium trivalent (Tb3+) doped yttrium phosphovanadates powders with formula YP0.5V0.5O4: 1 at % Tb3+ were synthesized by the sol–gel method, followed by annealing at different temperatures, between 500 C° and 1050 C°. The powders were characterized by X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM) and photoluminescence spectroscopy. Effects of annealing treatment on structural, morphological and photoluminescence properties of Tb3+ doped yttrium phosphovanadates are studied and discussed. XRD results revealed that the Tb3+ doped YP0.5V0.5O4 crystallizes in pure body centered zircon/xenotime-type tetragonal structure, with the I41/amd space group. The average crystallite size, found by XRD analysis, Increases from 22 to 38 nm as annealing temperature increases. Moreover, different morphology is observed when annealing temperature changes.

At an excitation wavelength set at 260 nm. a significant evolution of the emission spectrum was clearly observed, which shows that the effect of the heat treatment is significant. We also notice a broad emission band at 400 -530 nm, caused by the 3T1,2 → 1A1 transition of $(VO4)3^{-}$ as well as the emission lines associated with the 5D4→7Fj transitions belonging to the 4f-4f internal transitions of Tb3+ ions appear in emission spectrum. Two emission peaks of Tb3+ transitions were observed and these peaks were at 492 nm (5D4→7F6) and 545 nm (5D4→7F5) respectively. Their intensities strongly depend on the annealing temperature. These emission bands are refined with the annealing with a decrease in the widths of the peaks.

Keywords: *Photoluminescence, Annealing temperature, YP0.5 V0.5 O4: 1 at. % Tb3+,Sol-Gel.*

✉ *Corresponding Author Email : mraouefel@yahoo.fr*

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A Laplace Transformation-based Analytical Approach to Investigate Dynamic Acoustic Force Sensitivity by Utilizing Resonant Micro-cantilevers in Monomodal and Bimodal Operations

Cagri YILMAZ ✉
Akdeniz University, Department of Electronic and Automation, Vocational School of Technical Sciences, Antalya-TÜRKİYE

ABSTRACT

Resonantly actuated micro-cantilevers are widely utilized to investigate the observable sensitivities at the fundamental and higher eigenmodes to external forces in single- and multi-frequency operations. Mainly, responses of the micro-cantilevers to acoustic forces at various frequencies significantly vary depending on the resonance characteristics of the micro-cantilevers. A point-mass model of micro-cantilever dynamics can be used to acquire the analytical responses to dynamic acoustic forces for diverse operational modes. In this current work, firstly, the Laplace transform is applied to obtain the open loop transfer functions of the dynamic systems for single- and bimodal-frequency excitations. The variations in the corresponding locations of poles and zeros are determined to demonstrate different instabilities of the responses for varying acoustic force frequencies. In addition, magnitude and phase responses to dynamic acoustic forces at distinct frequencies are revealed for the first and second eigenmodes. Furthermore, new analytical expressions of displacements are utilized to observe resonant behaviors with the unit impulse input. The results obtained using analytical expressions are compared and validated with the numerical results achieved using the Fourth Order-Runge Kutta method. The closeness of analytical results to numerical results proves the validity of the analytical expressions for the oscillatory responses to acoustic forces. Therefore, the noval approach which is designed and implemented in this work is used to obtain a more complete description of the dynamics of the resonant micro-cantilevers under dynamic acoustic forces.

Keywords: *Acoustic force sensitivity, Micro-cantilever, Bimodal-frequency excitation, Laplace transformation, Zeros and poles of dynamic systems*

✉ *Corresponding Author Email : cagriyilmaz@akdeniz.edu.tr*

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Multicrystalline Silicon Wafers Morphological and Electrical Evaluation

Fouad KERKAR[1] ✉, Abdelkrim KHELOUFİ[1], Djamel OUADAJAOUT[1], Nahed DOKHAN[2],

[1] Centre de Recherche en Technologie des Semiconducteurs pour l'Energétique CRTSE, Alger, Algeria, 2 Bd Frantz Fanon BP n° 140 - 7 Merveilles, ALGERIA

[2]Research Unit Materials, Processes and Environment (URMPE), University M'Hamed Bougara, Boumerdes, ALGERIA

ABSTRACT

The quality of the crystal grown by directional solidification is largely determined by the thermal field and the solidification process, which affect both the yield of the ingot and the performance of future solar cells. In this our work, the morphology and the electrical as-cut wafer quality was studied through grain size characterization and variation of minority carriers lifetime, as a function of wafer position.The multi-crystalline silicon ingot is grown with directional solidification by Heat Extract Method (HEM). The growth rate is controlled to get a high quality crystal structure by adjusting the position of the crucible and the heater power. The ingot produced with HEM technic has shown the good uniform large grain with vertically-oriented grain boundaries. The average grain size is carried out over analyzing of wafer area. This method helps us to represent the average grain size wafer as a function of ingot position, where the ingot medium region presents high good crystalline quality. The minority carriers lifetime poor values are recorded in the bottom and high region of the ingot, where the relatively high lifetimes value (over 20 μs) are obtained in the central part of the ingots. This is due to the vertical grains structure obtained which minimize the obstacles for the carriers and which allow the easy transport of the charge carriers in the crystal. The variation of lifetime results are affected by the structural defected and grain structure morphology.

Keywords: *directional solidification, morphology, minority carriers lifetime.*

✉ *Corresponding Author Email : kerkarfouad@crtse.dz*

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Research Of Opportunities For The Intensification Of The Cast Iron Production Process In The Cupola Furnace

Izet IBRAHIMI[1], Zarife BAJRAKTARI-GASHI[1] ✉, Nderim TAHIRI[2], Skender NIKA[3]

[1] UIBM, Mitrovice, KOSOVO

[2] "E&E" Foundery, Gjakova, KOSOVO

[3] New Co Ferronickeli, Drenas, KOSOVO

ABSTRACT

Developing technologies for heat recovery of exhaust gases and preheating of the air for burning coke is one of the options for improving performance indicators for the production of cast iron in the foundry "E&E" in Gjakova/Kosovo as well as environmental protection. Such an option would be possible to develop if the process gases were intaken at a height of 600 to 1000 mm under the door for charging and returning them to the heated air system - HILDEN. The thermal energy recovery process is based on the use of the thermal, chemical and physical heat potential of the cupola furnace gases that are created during the melting process in the cupola furnace and the same would be used for preheating air for coke burning in V zone of furnace. To build the thermal profile of process, have been exploited the data from the thermal and chemical analysis of the gas, CaCO3 /coke cast iron and slag, the ratios between CO2 /CO, as well as granulometric analysis of CaCO3 and coke. While in the second phase are defined temperatures; liquidus, solidus and casting, as well as have been examined the physico-mechanical properties of cast iron. So, heated air system – HILDEN has resulted as option very favorable technological and commercial for energy recovery, air preheating and use gas in the process in the cupola furnace. The use of process gases according to our proposal, will express high effects in terms of the rational use of raw materials, energy and environmental protection.

Keywords: *Cupola furnace, cast iron, energy, recovery, cost reduction, efficiency.*

✉ *Corresponding Author Email : zarife.bajraktari-gashi@umib.net*

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Green Zone self-sustainable Park

Kenan PALLUSHA[1], Nderim BEQIRAJ[1], Yllka KABASHI[1], Fadil AJREDINI[2], Neset IZAIRI[2], Skender KABASHI[3] ✉

[1] University of Prishtina"Hasan Prishtina", Department of Electrical and Computer Engineering, Prishtina- KOSOVO

[2] University of Tetovo, Physics Department, Faculty of Natural Sciences and Mathematics, Tetovo-NORTH MACEDONIA

[3] University of Prishtina"Hasan Prishtina", Department of Physics, Prishtina-KOSOVO

ABSTRACT

Green Zone is a self-sustainable park and energy-free area which will generate renewable energy and will provide it free for visitors. It represents an innovative concept that is designed to achieve conscious awareness of environmental and technological concepts. Green Zone will provide sufficient energy for the supply of park lights, for charging technological and transportation equipment. The charging station will be the first, that is supplied by renewable energy resources in Kosovo. Implementation of this project will make this Park energy independent and self- sustainable Park.

Implemented Turbine will work by the principle of Gravitational Water Vortex which is characterized that it is Decentralized, no need for Dam construction, River will continue to stream free with no destruction in the environment. Additionally, this technology is fish-friendly, and in case of any flood risk, it would be durable. The operation of this technology can be manageable by remote monitoring. The installed turbine capacity is

5.6 KWh which works at a high-efficiency rate. Turbines are designed to install in rivers and mainly in irrigation canals with low differences in height and average quantity of water, and also civil work requirements are minimal. The electrical system is off-grid, except for the public lighting which is run by a hybrid inverter, which will be connected, the first source from the turbine and the second from the grid.

Our use case is in a very frequented Park, located in the heart of the City, under the Historical castle of Prizren and nearby the river of "Lumbardhi".

Keywords: *Renewable, hydropower, sustainability, reliable systems, charging stations, green environment, self- sustainable.*

✉ *Corresponding Author Email : skender.kabashi@uni-pr.edu*

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Abs. No: 109

Centrifugal Compressor Design For Small Scale Jet Engine

Anıl ERİŞEN ✉, Mustafa AY
Marmara University, Institute of Pure and Applied Sciences, Mechanical Engineering Department, İstanbul- TÜRKIYE

ABSTRACT

With the developing technology, unmanned aerial vehicles have become a rising trend in our country and in the world. In recent years; on the civilian side, with applications such as model airplanes and jetpacks; On the military side, the need for small-scale reactive engines began to increase with various unmanned aerial vehicles. As a result of this demand, the design, development, production and localization of small-scale jet engines (turbojet, turboshaft, turbofan, turboprop etc.) will come to the fore. In this study, a centrifugal compressor was designed for a mini-scale turbojet engine with 1100 N thrust force under development. Using the techniques learned from the literature review, the design and analysis of a compressor suitable for the engine being developed has been made. Optimization studies were carried out until the desired results were obtained in aerodynamic and mechanical analyzes. In computational fluid dynamics analysis; The results of the fluid such as temperature, pressure, velocity, flow rate and efficiency were examined. Under the heading of mechanical analysis, stress, deformation, disc rupture, fatigue and vibration analyzes were performed. As a result of all these studies; An 85% efficient compressor with a compression ratio of 4 is designed at a flow rate of 1.8 kg/s.

Keywords: *Centrifugal compressor, radial compressor, mini jet engine, optimization, finite element analysis, computational fluid dynamics.*

✉ *Corresponding Author Email : anilerisen@hotmail.com*

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Abs. No: 110

Effect of fatigue on Mechanical Behaviors of Weld Overlay ENiCrMo-3 on 25CD4 Steel Substrate Using SMAW Process

Djilali. ALLOU[1] ✉, Djamel MIROUD[2], Sarra. DJEMMAH[1.2]

[1] Research Center in Industrial Technologies (CRTI), PB 64, Chéraga, Algiers, ALGERIA

[2] Materials Technology Laboratory, LTM, USTHB, PB 32, Bab Ezzouar Algiers ALGERIA

ABSTRACT

In the present study, we investigated the effect of fatigue on the mechanical behaviors of weld overlay ENiCrMo-3 on a 25CD4 steel substrate using the SMAW process. The microstructure of the ENiCrMo-3/25CD4 substrate interface primarily consisted of columnar Ni-γ. a diffusion gradient of Fe, Cr, and Ni elements from the melting limits towards the type II boundary near the interface. Based on the fatigue test results, the specimen, which was tested at the ultimate tensile strength, exhibited superior fatigue endurance compared to the first specimen tested at the ultimate tensile strength. elasticity limit. This suggests that the material had greater fatigue resistance when subjected to a percentage of the ultimate tensile strength, as it withstood a greater number of cycles over a longer duration.

The electrochemical behavior of the ENiCrMo-3 overlay and the 25CD4 substrate in a NaCl 3.5% solution indicated the presence of galvanic corrosion. The Tafel curves demonstrated that the corrosion process could be divided into two parts, emphasizing the aggressiveness of Cl- ions. Electrochemical impedance spectroscopy (EIS) measurements showed that the resistance to charge transfer of the ENiCrMo-3 hardfacing was greater than that of the substrate/ENiCrMo-3 interface and the substrate itself.

Keywords: *25CD4 steel substrate, ENiCrMo-3 hardfacing, fatigue behavior*

✉ *Corresponding Author Email : d.allou@crti.dz*

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Abs. No: 115

Application of deep neural network for diagnosis of roller bearing faults in induction motor

Tarek KHOUALDİA[1,2] ✉, Zoubir CHELLİ[3], Sofiane BOUKHARİ[4]

[1] Mohamed-Cherif Messaadia University, Mechanical Engineering Department, Souk Ahras - ALGERIA

[2] Laboratory of Research on Electromechanical and Dependability (LRESF), University of Souk Ahras, ALGERIA

[3] Mohamed-Cherif Messaadia University, Electrical Engineering Department, Souk Ahras - ALGERIA

[4] Mohamed-Cherif Messaadia University, Civil Engineering Department, Souk Ahras - ALGERIA

ABSTRACT

Induction motor is one of the most important parts of rotating machines and the detection of their defects has become a major trend. However, the major type of failures that the induction machine is subjected to is the bearing failures. In this paper, to make a good diagnosis of bearing faults in induction motors, a monitoring system based on a deep neural network (DNN) model is proposed. To train and test the DNN, the main indicators were calculated from the collected vibration signals. The coding of the various faults is used at the network output. However, optimization of the hidden layer of DNN with the Levenberg-Marquardt learning algorithm was performed to determine the best neural network. Therefore, the proposed method is effective for monitoring and diagnosing other various industrial cases.

Keywords: *Induction motor Faults, Conditional maintenance , DNN*

✉ *Corresponding Author Email : t.khoualdia@univ-soukahras.dz :*

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Abs. No: 117

Contribution to the study of a photovoltaic pumping chain in the Tiffech region, Souk ahras, Algeria

Zoubir CHELLİ[1] ✉, Tarek KHOUALDİA [2], Sofiane BOUKHARİ[3]

[1] Mohamed-Cherif Messaadia University, Electrical Engineering Department, Souk Ahras - ALGERIA

[2] Mohamed-Cherif Messaadia University, Mechanical Engineering Department, Souk Ahras - ALGERIA

[3] Mohamed-Cherif Messaadia University, Civil Engineering Department, Souk Ahras - ALGERIA

ABSTRACT

Submerged centrifugal pumps, powered by photovoltaic (PV) generators, are the prefiguration of the pumps of tomorrow. The enormous advantage of these installations lies in the fact that they can be dispensed with a storage system by batteries or by tank and injected all the water pumped into the tanks. A PV system consists of several interconnected solar cells, a chopper to adapt the load, and an inverter that transforms direct current into alternating current. In order to optimize the management of a PV pump installation, it is necessary to be able to compare the measurements of various installations with each other for different module technologies and system designs. In this article, we present an analytical method of sizing based on the water needs, the sunshine data, and the efficiency of the motor pump unit. We also present the PV pumping system simulation result using the PVsyst 6.62 software. The analytical sizing method is based on water requirements, solar data, the motor pump performance of the unit, and the well and reservoir characteristics. Also, we present the simulation result of the PV pumping system using the pvsyst6.62 software. Thus, we present an interpretation of our results by evaluating the photovoltaic power (energy) produced and the quantity of water pumped to obtain information for better management of our installation.

Keywords: *Photovoltaic (PV) generators, PVsyst 6.62 software, Maximum Power Point Tracking (MPPT)*

✉ *Corresponding Author Email : zoubir.chelli@univ-soukahras.dz*

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Abs. No: 119

Robustness & validation RP-HPLC Method for Assay of Pinaverium Bromide Tablet

Islem BENGHEZAL[1] ✉, Feriel REGGABI[2],

[1] University Blida 1, Faculty of Medecine, BP270 Soumaa road, Blida, ALGERIA,

[2] Faculty of pharmacy,Pharmacy Department,Lieutenant Mohamed Benarfa, El Biar, ALGERIA

ABSTRACT

Pinaverium Bromide is a spasmolytic agent used for functional gastrointestinal disorders. It is a quaternary ammonium compound that acts as an atypical calcium antagonist to restore normal bowel function. Assay is an important parameter in the specification of drug products as indicated in the Q6A guideline. In order to obtain results close to the true value, it is necessary to have a valid analysis procedure and robust.

Materials & Methods:

Validation of the method was performed on a Waters HPLC and PDA detector. A Cosmosil 5 C18-MS-II column purchased from Nacalai. Reagents are from Panreac. Study Robustness, a factorial design 23 was chosen to study the factors that seem to influence the chromatographic analysis. The factors are pH, organic fraction, and weighing of the Pinaverium. The validation of the analysis technique was undertaken by referring to the validation criteria of the ICH Q2 (R1) and SFSTP. The chromatography was performed at 25°C on a C18: 5µm, 150 mm×4.6 mm column with mobile phase buffer Solution/Acetonitrile, and UV detection at 210 nm.

Results & Conclusions:

The effect of each factor and their interaction was calculated. Peak characteristics, were used to observe the changes in the method. Most of them have influenced. Specificity,
no interfering. The linearity verified within the range 60–140 % of the reference. Accuracy: The value of 100% is included. Coefficient of variation of the fidelity is less than 5%. Limits detection and quantification are LOD=0,45 µg/ml and LOQ= 1,34 µg/ml.

Keywords: *Pinaverium Bromide, Robustness, validation, HPLC*

✉ *Corresponding Author Email : biophysiquepharma@gmail.com*

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Abs. No: 120

Validated LC Method for measuring the release of Solifinacin Succinate Tablet Immediate Release in Dissolution Media

Islem BENGHEZAL[1] ✉, Feriel REGGABI[2],

[1] University Blida 1, Faculty of Medecine, BP270 Soumaa road, Blida, ALGERIA,

[2] Faculty of pharmacy,Pharmacy Department,Lieutenant Mohamed Benarfa, El Biar, ALGERIA

Abstract

Background & Aims:

Solifenacin is a competitive muscarinic receptor antagonist indicated to treat an overactive bladder with urinary incontinence. Dissolution Testing is the specification for solid oral dosage forms, Single-point measurements are normally considered to be suitable for immediate-release; to our knowledge none of these methods have been adapted to the measurement of the release of Solifinacin Succinate in Dissolution Media.

Materials & Methods:

Validation of the method was performed on a Waters e 2695 HPLC system and a 2998 PDA detector. A Cosmosil 5 C18-MS-II column purchased from Nacalai was used. Dissolution apparatus were performed on a Sotax. Reagents are from Panreac. The method used has been adapted for the analysis of the Solifinacin Succinate content; the media is deaerated water, the quantity released of solifinacin succinate after 45 min must be at least 80%. The chromatography was performed at 25 °C on a Cosmosil 5 C18-MS-II: 5 µm, 250 mm×4.6 mm column with mobile phase: Buffer Solution /Acetonitrile, UV detection at 210 nm. The validation of the analysis technique was undertaken by referring to the validation criteria of the ICH Q2 (R1) and SFSTP.

Results & Conclusions:

Specificity,no interfering. The linearity verified within the range 60–120 % of the reference solution. Accuracy: The value of 100% is included. Repeatability and Intermediate Repeatability coefficients of variation are less than 5%. The limits of detection and quantification are The LOD=0, 39 µg/ml and LOQ= 1,31 µg/ml.

Keywords:*Solifinacin Succinate, validation, HPLC*

✉ *Corresponding Author Email : biophysiquepharma@gmail.com*

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Abs. No: 121

Design And Optimization Of An Eiffel Type Wind Tunnel For Scaled Vehicle Tests

Fazıl GÜMÜŞAY[1,2] ✉, Ünver ÖZKOL[1], Süphan ERCAN[2]
[1] *İzmir Institute of Technology, Department of Mechanical Engineering, İzmir-TURKEY*
[2] *Cevher Alloy Wheels, Research and Development Dept., İzmir-TURKEY*

ABSTRACT

Drag reduction in passenger vehicles has gained importance in recent years, particularly with the ongoing efforts in electric vehicle mileage improvements. One of the major sources of vehicle aerodynamic drag comes from the wheels and their hubcaps. Aerodynamic testing of hubcaps helps engineers to develop low-drag designs. This study proposes a method for determining geometrical configurations for sub-sonic, open circuit, Eiffel-type wind tunnel for vehicle aerodynamics. It summarizes the first part of an ongoing project by CEVHER Alloy Wheels Inc. where a new series of low-drag hubcaps are being developed. The ranges of wind tunnel sizes considered are 7m to 45m in total length and 2.5m to 16m in width. Simulations of highway driving conditions are also performed in order to estimate realistic drag force and lift forces for a randomly chosen vehicle shape resembling a family van.

Keywords: *Vehicle Aerodynamics, Drag Coefficient, Wind Tunnel, Car, Aerodynamic Design*

✉ *Corresponding Author Email : fazil.gumusay@cevher.com*

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Abs. No: 123

Interfacial Stress Analysis in FRP Reinforced RC Beams Using ANN Method

Rezki AMARA[1] ✉, Mokhtar NEBAB[1,2], Ait Atmane HASSEN[1], Bennai RIADH[1]
[1] *University Hassiba Benbouali, Department of civil engineering, Faculty of civil engineering and architecture, Chlef, ALGERIA*
[2] *University M'Hamed Bougara, Department of civil engineering, Faculty of technology, Boumerdes, ALGERIA*

ABSTRACT

Concrete is the most widely used material in the construction industry worldwide. The characteristics of this material, as well as climatic and usage conditions, are among the primary causes of pathologies in main elements of reinforced concrete structures, such as cracks and corrosion, among others. Instead of demolition, it is often appropriate to proceed with the rehabilitation and reinforcement of concrete elements using FRP plates. On the other hand, the rapid development in programming techniques encourages engineers to utilize artificial intelligence in the construction field.

This paper introduces a novel approach that utilizes artificial neural networks to predict interfacial shear stresses and normal stresses when damaged RC is reinforced by externally bonded prestressed composite plates. This investigation considers all the factors influencing the variations in normal stress and shear stress, employing artificial intelligence through the implementation of artificial neural network techniques. This technique takes inspiration from the biological brain, which involves making predictions to determine force variations and finding solutions to any given problem. It has been found that this prediction method yields fairly acceptable results based on a reference database used for the prediction program.

Keywords: *composite plate, interfacial stresses, damaged RC beam, strengthening, artificial neural network.*

✉ *Corresponding Author Email : rezkiarezki941@gmail.com*

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Abs. No: 124

Degradation of RhB by Er-Doped TiO2-Modified Silicon Nanowires as Photocatalyst

Sihem Aissiou BOUANIK, Toufik HADJERSI ✉, Amar MANSERI

Centre de Recherche en Technologie des Semiconducteurs pour l'Energétique (CRTSE) 02, Bd Frantz Fanon, BP. 140, Alger-7 Merveilles, Algiers, ALGERIA

ABSTRACT

It is well known that TiO2 is among the most studied photocatalysts for degrading of organic pollutants due to its nontoxicity, high oxidation potential, good photochemical stability, and good photocatalytic activity. However, pure TiO2 is scracely used in practical applications because of its large band gap and high recombination rate of photogenerated carriers. For these reasons, the doping of TiO2 with Er is used to expand the light harvesting region of TiO2 and promote the charge separation efficiency thereby improving photocatalytic performance. In this work, silicon nanowires (SiNWs) were successfully synthesized by Ag-assisted chemical etching and coated by an Er-doped TiO2 film using hydrothermal method. The SiNWs length and the Er concentration were varied in order to study their effect on phocatalytical activity. The obtained samples were characterized by scanning electron microscopy (SEM) coupled with energy dispersive X-ray (EDX), X-ray diffraction (XRD), photoluminescence (PL) and UV–Vis spectrophotometry. The Er-doped TiO2-modified SiNWs were applied as photocatalyst to degrade Rhodamine B (RhB) molecule under UV and visible light irradiations. The highest photocatalytic activity was achieved under UV irradiation with a degradation rate higher than 90% after 100 min using SiNWs with length of about 4.5 μm and covered by a film of 0.75% erbium-doped TiO2. Finally, it is shown that Er doping significantly improved the photocatalytic performance; the mechanism for the photodegradation of RhB was also proposed.

Keywords: *Silicon nanowires; photocatayst , rhodamine B,*

✉ *Corresponding Author Email : hadjersi@yahoo.com*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)

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Abs. No: 128

Microbiological Control Of The Effectiveness Of The Disinfection Process For Orthodontic Pliers

Samia BEROUAKEN[1] ✉, Mounia BENAMARA[1], DAHMAS [2], Samia ABDI[3]

[1] BLIDA University, Pharmacy Department, Blida- ALGERIA

[2] BLIDA University,dental Department, Blida- ALGERIA

[3] BLIDA University, Medicine Department, Blida- ALGERIA

ABSTRACT

I.INTRODUCTION:

Disinfection and sterilization are for dento-facial orthopedics as for all medical professions an unavoidable obligation, its objective is to prevent infectious risks both for the patient and the health care team.

II.OBJECTIVE:

Checking the effectiveness of the disinfection process of orthodontic pliers.

III.MATERIAL AND METHODS:

This is a serial case study, carried out at the Zabana Dental Clinic of Blida University Hospital Centre and the Microbiology Unit of the Central Laboratory of the University Hospital Centre unit Frantz Fanon. The study was conducted over a period of 02 months, February and March 2022.

The study involved 54 orthodontic pliers. Each instrument was swabbed three samples , one directly after contact with the patient's oral cavity, and two after 10 and 15 minutes of disinfection.

IV.RESULTS:

Microbiological analysis showed that 100% of the orthodontic pliers collected not disinfected are contaminated by bacteria with polymicrobial cultures mainly composed of Streptococci, Neisseria and Micrococcus.

43.75% of orthodontic pliers disinfected for 10 minutes are contaminated with bacteria.

24.07% of orthodontic pliers disinfected for 15 minutes are contaminated with bacteria.

The disinfection rate of the orthodontic pliers was 35.18% after the first disinfection time and 75.92% after the second disinfection time with $p < 0.05$, the difference is significant.

V.CONCLUSION:

In the fight against infections associated with care and to reduce cross-infections transmission, sterilization of reusable instruments, and the use of medical and surgical materials to Single use is the best way to ensure the safety of patients and staff from infectious risk.

Keywords: *Disinfection, Sterilization, Infectious risks, Microbiology control, Orthodontic pliers.*

✉ *Corresponding Author Email : sbwork2009@gmail.com*

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Abs. No: 1297

Conditioning of Low-Level Radioactive Wastes (LLRW), Spent Radiation Sources (SRS), their transport to Temporary Storage Facility in Kosovo and Albania

Besire CENA[1], Nazmi HASI[1] ✉ Luan QAFMOLLA [2]

*[1] * University of Mitrovica "Isa Boletini", Str.Ukshin Kovaqica, Mitrovica 40000, KOSOVA*

[2] Institute of Radiation Protection, Tirana, ALBANIA

ABSTRACT

Aspects of management and treatment of radioactive wastes resulting from the use of radioisotopes and radiation sources in research, medicine, industry, and agriculture are described. The paper presents actual situation in Kosovo and Albania concerning the management of low level of radioactive wastes, (namely the hazards waste inventory), their classification, temporary interim storage, their transport to final disposal, considering IAEA documents on this topic (1,2). The methods applied for the conditioning of LLRW and SRS are simple. Solid radioactive wastes with low-level activity, after accumulation, minimization, segregation, and measurement are compressed in a simple compactor of the PGS type. Important event after the inventory of radioactive waste in Kosovo and Albania, has been, their location and the ID (identification number) of radioactive sources, based at the type of radioisotopes and their activities. SRS are placed into 200 Litter drums, are cemented, and conditioned from the Radiation Protection Divisions, which is the responsible Institution for treatment and management of radioactive wastes, and later transported to temporary interim storage buildings of respective countries. More than 100 sealed radioactive sources have been in use in nuclear medicine departments of hospitals in Kosovo, industrial end users etc., including radioactive sources lightning.

Keywords: *Waste Management, radioactive waste generating, storage.*

✉ *Corresponding Author Email : nazmi.hasi@umib.net*

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Abs. No: 130

Recovery of Pure Silicon from Damaged Crystalline Silicon Cells

Sabiha ANAS BOUSSAA[1,2] ✉, Abdallah TRAD KHODJA[3], Messaouda AYACHI[3], Fatima BOUDEFFAR[1], Abderrahmane NAAS[3], Rabia RAHMOUNE[1], Bilal MERAZKA[1], Amar MANSERI[1]

[1] Research Center On Semiconductor Technology for Energetic, CMSI-CRTSE, 2 BD Frantz Fanon, 7 merveilles, POB 140, Algiers, ALGERIA

[2] University of Sciences and Technology Houari Boumediene USTHB, Laboratory of Materials Technologies. B.P.2 El Alia, Bab Ezzouar, Alger, ALGERIA

[3] Research Center On Semiconductor Technology for Energetic, DDCS-CRTSE, 2 BD Frantz Fanon, 7 merveilles, POB 140, Algiers, ALGERIA

[4] Research Center On Semiconductor Technology for Energetic, CCPM-CRTSE, 2 BD Frantz Fanon, 7 merveilles, POB 140, Algiers, ALGERIA

ABSTRACT

Silicon is the most used semi-conductor for solar energy production. Metallization is one of the most important process steps for low cost production of high performance solar cells.

Most photovoltaic solar cell manufacturing uses thick film screen printing metallization with Ag-bearing pastes or aluminium to manufacture solar cells.

In the present work, a specific method using alkaline solution were used for etching the metallic contacts from the front and back of crystalline silicon cells and removal the antireflective layer.

Before and after the chemical treatment several characterizations were done, using SEM, XPS, FTIR …..

Finally, the pure silicon from damaged cells was successfully recovered according to the proposed method and the characterizations confirmed our finding.

Keywords: *silicon, recovering, recycling, damaged cells, pure.*

✉ *Corresponding Author Email : sabiha.anas@gmail.com anassabiha@crtse.dz*

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Abs. No: 132

Study of the effect of 3D printing parameters on the cross-linking rate of stereolithography.

Katib HAMLAOUI[1,2] ✉ Boussaha BOUCHOUL[1], LeilaLAMIRI[1], Radhia KHOUATRA[1]

[1]Research Center in Industrial Technologies CRTI, B.P.64, Cheraga 16014 Algiers, ALGERIA

[2]Badji Mokhtar University -Annaba- B.P.12, Annaba, 23000 ALGERIA

ABSTRACT

Additive manufacturing or 3D printing is a process of making three-dimensional solid objects from a digital file with complex shapes and unique properties. The kinetics of photo-polymerisation (solidification) of photosensitive polymer resins have an impact on the conversion rate of photosensitive polymer resins, which influences the final properties of the product. SLA method, which is considered as the beginning of Additive manufacturing methods, is still preferred widely. Rapid printing, high resolution, and low cost advantages are the most outstanding features of this approach.The aim of this work is to develop a numerical model to study the effect of 3D printing parameters (radiation power, wavelength, layer thickness, etc.) on the mechanical, thermal and physico-chemical properties and kinetics of photopolymérisation.

Keywords: *Sereolitography SLA, 3D printing, photopolymerization, photosensitive polymer.*

✉ *Corresponding Author Email : hamlaouikatib@yahoo.fr, k.hamlaoui@crti.dz*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)
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Abs. No: 133

A dosimetric comparison of 3D Conformal Radiation Therapy and VMAT techniques in the treatment of locally advanced cervical cancer

Fesal SELIMI[1,2] ✉, Doriana PALOJI[1,2], Labinot KASTRATI [1,3], Gëzim HODOLLI[1,4], Kushtrim DINA[1,2], Brunilda PROFKA HAXHIU [1], Behar RACI[1]

[1] University Clinical Center of Kosovo, 10 000 Pristina, Republic of KOSOVO
[2] Alma Mater Europaea Campus College dhe Poliklinika "Rezonanca" 10 000 Pristina, Republic of KOSOVO
[3] University of Mitrovica "Isa Boletini", 40 000 Mitrovica, Republic of KOSOVO
[4] University of Pristina "Hasan Pristina", 10 000 Pristina, Republic of KOSOVO

ABSTRACT

Radiation therapy in concomitant treatment with chemotherapy, followed by brachytherapy, is the standard treatment for locally advanced cervical cancer.

In this study, were analyzed the divergences in the Planning Target Volume (PTV), and the percentage of dose distribution in the organs at risk (OARs) between two different treatment techniques, 3D-CRT (three dimensional conformal therapy) and VMAT (volumetric Modulated Arc Therapy). The study included 5 patients diagnosed with locally advanced, inoperable cervical cancer, treated in the Oncology Clinic in the Republic of Kosovo. For all patients two treatment plans were realized, based on the same CT (Computer Tomography) simulation and contour. In order to compare the two techniques, the RTOG protocols were applied for dose coverage in PTV, with its dose values (DMax, DMean, and DMin) and the dose in the OARs (bladder, rectum, small bowel and femoral heads).

Based on findings, obviously, the VMAT technique is superior to 3D-CRT, for treatment of cervical cancer. The VMAT technique has advantages on better PTV coverage and it reduces the dose to the OARs (bladder, rectum, small bowel and femoral heads). In addition, VMAT technique reduce significantly the treatment time of patient.

Keywords: *3D-CRT, VMAT, cervical cancer, PTV, OARs*

✉ *Corresponding Author Email : fesalselimi@yahoo.com*

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Abs. No: 135

Structural, optical and electrical properties of sprayed ZnO thin film: influence of (Al and Mo)-doping

Noubeil GUERMAT[1] ✉, Warda DARENFAD[2], Kamel MIROUH[2], Abderrahmane HERBADJI[1,3]

[1] University of M'sila University, Department of Electronics, PO Box 166 Ichebilia 28000 Msila, ALGERIA

[2] Laboratory of Thin films and Interfaces, University of Constantine 1, 25000 Constantine, ALGERIA

[3] University of Setif-1, Department of Electronics, 19000 Setif-ALGERIA

ABSTRACT

In this study, we investigated the effect of the addition of dopants such as aluminum (2% Al) and molybdenum (2% Mo) on the structural, optical and electrical properties of ZnO films deposited by the spray pyrolysis. We used several characterization techniques to study our films, including X-ray diffraction (XRD) for structural analysis, a UV-visible spectrophotometer for optical properties, and the four-point method for electrical properties. The samples deposited showed that the films produced by the spray pyrolysis method were polycrystalline, with a hexagonal structure of the Wurtzite type. This was confirmed by the presence of an intensive peak corresponding to the orientation (002) located around the angle of 34.82° in the X-ray diffraction spectrum. No other phase was detected in the samples. The analysis carried out using the UV-visible spectrophotometer revealed that the doping with aluminum and molybdenum improves the transmittance of the ZnO film significantly with a large value obtained for the ZnO:2%Al film. Regarding the electrical properties, the electrical analysis showed that all the doped films exhibited an improvement in electrical conductivity compared to the pure ZnO film. The ZnO:2%Mo film in particular displayed a relatively low electrical resistivity, measured at 0.0313 Ω.cm. This study showed that the addition of dopants such as aluminum and molybdenum to ZnO films deposited by spray pyrolysis had a significant impact on their structural, optical and electrical properties. The doped films exhibited better transmittance, improved electrical conductivity, and could hold promise for applications such as thin-film solar cells.

Keywords: *Thin films, Al and Mo doped ZnO, Spray pyrolysis*

✉ *Corresponding Author Email : noubeil.guermat@univ-msila.dz*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)

27-30 October 2023, ANTALYA -TURKEY

Abs. No: 136

Critical strain for dynamic recrystallisation during constant strain rate hot deformation of X70 steel

Zidelmel SAMI ✉, Manssouri TAHAR

Laboratoire Génie des Procedés, Université Ammar Tellidji, Laghouat ALGERIA

ABSTRACT

The dynamic recrystallization (DRX) and flow stress of X70 steel were investigated by means of isothermal single compression testing at temperatures of 900~1050 °C and at constant strain rate 0.5mm/s and 1 mm/s using a Gleeble 3500 thermo-mechanical simulator in order to model the DRX processes and predict the flow stress during plate rolling. Determination of critical points on hot stress-train curve of metals is crucial in thermo-mechanical processes design. In this investigation a Gleeble 3500 thermo-mechanical simulator is given to illustrate the behaviour of metal during hot deformation processes such hot rolling. All samples were first heated up to 1150 °C at the heat rate of 5 °C/s. After holding at 1150 °C for 5 min to ensure that the specimens had a uniform temperature, the specimens were cooled to different deformation temperatures. After being held for a while for uniformity in the tested temperature, the specimens were deformed at various strain rates. After hot deformation, the specimens were immediately quenched in water to capture the microstructure of hot deformed material.

Keywords: *Microalloyed steel, dynamic recrystallization (DRX), Critical strain for (DRX).*

✉ *Corresponding Author Email : s.zidelmel@lagh-univ.dz*

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Abs. No: 137

Effect of boriding treatment and operating parameters on sand slurry erosion of X52 steel

Dakmoussi MAAMAR, Zidelmel SAMI ✉, Allaoui OMAR
Laboratory Process Engineering, University of Laghouat 0300, Laghouat, ALGERIA

ABSTRACT

In transporting oil and gas through pipelines, slurry erosion is responsible for severe problem. In this study, we determined the effect of slurry concentration and velocity on the erosion rate of API X52 steel. The slurry concentrations employed were 500 g/l, 700 g/l and 900 g/l while slurry velocities are 3.8 m/s and 5.7 m/s. Boriding is performed in a powder mixture containing 5% of B4C as source of boron, 5% of NaBF4 as activator and 90% of SiC as diluent at 900 °C for a period of time from 4 h. It is found that erosion rate increases with increasing slurry concentration and slurry velocity. The slurry erosion mechanisms of borided and unborided samples were investigated using scanning electron microscopy. The results showed that formation of the boride layers exhibited higher slurry erosion resistance compared to the unborided X52 steel.

Keywords: *X52 steel, Boriding, slurry erosion resistance*

✉ *Corresponding Author Email : s.zidelmel@lagh-univ.dz*

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Abs. No: 138

Characterization of an iron-based alloy produced by powder metallurgy

Rafik MAKHLOUFI[1] ✉, Ahmed BOUSSAHA[2], Lazhar BAROURA[3], Hamza BENNACEUR[4]

[1] University of Batna 2 Mostafa Ben Boulaid, Department of Mechanical Engineering, LICEGS Laboratory, ALGERIA

[2] University of Batna 2 Mostafa Ben Boulaid, Department of Mechanical Engineering, ALGERIA

[3] University of Constantine 1, Institute of Applied Science and Technology, ALGERIA

[4] University of Batna 2 Mostafa Ben Boulaid, Department of Mechanical Engineering, ALGERIA

ABSTRACT

This work aims to characterize an iron-based alloy whose chemical composition is well known. After the samples preparation by powder metallurgy process, the study uses different caracterization methods, optical characterization, mechanical by durometer, X-ray diffraction with DRX, SEM metallographic. This leads to development of iron-based alloys intended for various industrial fields such as the manufacture of cutting tools.

Keywords: *Powder Metallurgy, Iron-Based Alloy, Cutting Tools, X-ray diffraction.*

✉ *Corresponding Author Email : r.makhloufi@univ-batna2.dz*

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Abs. No: 139

On Symplectic Form of Physical Systems with Symmetry

Burim KAMISHI ✉

Unıversıty of Prishtina, Faculty of Mathematics and Natural Sciences, Department of Physics, Prishtina- KOSOVO

ABSTRACT

A characterization of Hamiltonian actions on symplectic manifolds is given in this work. It is shown how some ideas from the theory of Hamiltonian systems with symmetry can be applied to dynamical systems, and how Lie groups can act on symplectic manifolds via Hamiltonian vector fields, known as Hamiltonian actions. A discussion of circle actions and their relation to 2-sphere bundles and on general Hamiltonian group actions on a symplectic manifold and moment maps has been given. Specifically, it is shown that because the symplectic form gives a non-degenerate pairing on $T_m M$, if V is a symplectic space, ω defines a bijective linear map $V \to V^*$. Hence $\left(X_H\right)_m$ is defined for all $m \in M$, where $X_H \in \Gamma(TM)$ is the Hamiltonian vector field. Conversely, if a vector field ξ on M is given, ω determines a closed 1-form on M.

Keywords: *Symplectic form, Symplectic manifold, Hamiltonian action*

✉ *Corresponding Author Email : burim.kamishi@uni-pr.edu*

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Abs. No: 140

Effect of the nature and the proportion of the activator on the borides layers produced on C35 steel by the powder technique

Med Redouane BARKAT[1], Omar ALLAOUI[1]✉, Sami ZIDELMEL[1], Mourad KEDDAM[2]

[1] Process Engineering Laboratory, Amar Telidji university of Laghouat, Laghouat, ALGERIA
[2] Laboratory of Materials Technology, Faculty of Mechanical Engineering and Process Engineering, USTHB, B.P. No. 32, 16111 El-Alia, Bab-Ezzouar, ALGERIA

ABSTRACT

The boriding process in solid medium using the powder technique is one of the simplest and most widely used in industry. A boriding powder generally consists of a boron source, an activator, and a diluent. Depending on the boron activity provided in the boriding powder, the boride layers can be single-phase (Fe2B) or dual-phase (Fe2B + FeB). The boron activity in the powder is often controlled by controlling the chemical composition of the boriding powder by adjusting the proportion of the three constituents and the nature and percentage of the used activator.

The objective of this work is to study the effect of the nature and proportion of the used activator in a powder consisting of boron carbide (B4C) as a boron source and silicon carbide (SiC) as a diluent for treatments of 5 hours at 950°C on the nature and quality of the obtained layers. Three different activators (NaBF4, NaF and NH4Cl) were used with proportions of 2, 4, 6, 8, and 10% in a powder where the percentage of boron source is kept fixed at 5%.

The obtained results showed that for NaBF4, the boride layer is single-phase (only Fe2B) up to 8% where the FeB boride begins to appear, while for NaF, the FeB boride begins to appear from 4%. Finally, for NH4Cl activator beyond 2% the obtained layers are very porous and of poor quality. The best boride layer thicknesses (around 125 µm) were obtained with NaBF4 activator.

Keywords: *Boriding Treatment, Powder technique, Activator, Diffusion*

✉ *Corresponding Author Email : o.allaoui@lagh-univ.dz*

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Abs. No: 141

Mechanical Characterization of Chromium Carbide Layers Obtained on 100Cr6 and X200Cr12 Steels by Conversion Treatment

Abdelghani BELHOCINE[1,2], Omar ALLAOUI[1] ✉, Mourad MAZOUZ[1,2]
[1] Process Engineering Laboratory, Amar Telidji university of Laghouat, Laghouat, ALGERIA
[2] Mechanical Department, University of M'sila, M'sila, ALGERIA

ABSTRACT

Carbides of transition metals are widely used due to their interesting properties. Several deposition methods and techniques can be used to produce carbide coatings. The choice of coating technique depends on several parameters such as, the conditions of use of these deposits, the thickness to be produced, the adhesion between the substrate and the deposit,… In this work, hard coatings of chromium carbide were produced by a conversion treatment on 100Cr6 and X200Cr12 steels. The conversion treatment consists of electrodeposition of chromium on the surface of 100Cr6 and X200Cr12 steels followed by diffusion annealing treatment at 1000 and 1100 °C for holding times of 1 and 2 hours.

The obtained results show that, for all the conversion treatments carried out in this work, there was formation of chromium carbides layer on the surface of steel. However, it should be noted that the nature of the constituting phases of the formed layer depends on the temperature of the diffusion annealing treatment and the duration at this temperature. The microhardness profile and the scratch test show that the X200Cr12 steel sample shows better results.

Keywords: *Annealing Treatment, Chromium Carbides, Coating, Diffusion*

✉ *Corresponding Author Email : o.allaoui@lagh-univ.dz*

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Abs. No: 148

The influence of the governing parameters on mechanical and thermal properties of two species of hybrid composites Al-2wt%MWCNTs-2wt%B4C and Al-4wt%CNTs doped by graphene at low milling time

Hacene HACHACHE[1], Zineb HAMLATI[1]✉, Safia ALLEG[2], Peter Apata OLUBAMBI[3], Ngeleshi Michel KİBAMBE[4]

[1] Aeronautical sciences laboratory, Institute of Aeronautics and Space studies, University of Blida-1, Blida, ALGERIA

[2] Laboratory of Magnetism and Spectroscopy of Solids (LM2S) Department of Physics, Badji Mokhtar- Annaba University, Annaba, ALGERIA

[3] Centre for Nanoengineering and Tribocorrosion, School of Mining, Metallurgy and Chemical Engineering, University of Johannesburg, Johannesburg 2028, SOUTH AFRICA

[4] Faculty of Engineering and But Environment, Department of Metallurgy, University of Johannesburg, Johannesburg 2028, SOUTH AFRICA

ABSTRACT

The incorporation of carbon nanotubes (CNTs) and boron carbide (B4C) in aluminum matrix composites brings significant advantages and gain a considerable attention in last decades. Together, they create hybrid composites with superior mechanical strength, enhanced thermal stability, and increased resistance to wear and thermal shock. These properties make them ideal for a variety of applications, including aerospace, automotive, and defense industries.

Based on Mechanical Alloying at low velocity and low milling time, this study examines the impact of two types of carbonous reinforcements on Al-2wt%MWCNTs-2wt%B4C and Al-4wt%CNTs doped by 12wt%graphene composites. The obtained phases, thermal and mechanical properties are investigated using SEM, XRD, DSC, Vickers microhardness which increased by 46.4% and decreased by 1.6% compared to the starting Aluminim.

Keywords: *Nanocomposite, Mechanical alloying, CNT*

✉ *Corresponding Author Email : zhamlati@gmail.com*

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Abs. No: 154

Nuclear structure investifation of A=80 neutron-rich systems in the vicinity of 56Ni mass region

Fatima BENRACHI✉, Nadjet LAOUET, Hanane SAIFI
LPMPS Laboratory, Frères Mentouri Constantine-1 University, Constantine ALGERIA

ABSTRACT

Significant advances in the development of experimental techniques and radioactive beams have made it possible to explore more exotic nuclei. Systems located on drip lines beyond the Ni region are of particular interest in the nuclear structure studies. Consequently, this region is still unexplored and the discovered isotopes have less known experimental data.
In this regards, we concentrated on some nuclei with A=80 mass and nucleons out of Z=28 and N=28 closed shells. We have performed some spectroscopic calculations in the framework of the nuclear shell model by means NushellX@MSU nuclear structure code. The jj44pn valence space consisting of (f5pg9) proton and neutron orbitals with new single particle energies outside of 56Ni doubly magic core is used and an effective interaction deduced from jj44bpn one is introduced taking into account the nuclear monopole effect in this mass region. Energies of the low-lying states, transition probabilities and some others properties of these isobars have been determined. The obtained results have a good agreement compared to the available experimental data.

Keywords: *56Ni core, A=80 Neutron-rich nuclides, NuShellX@MSU nuclear structure code, spectroscopic properties.*

✉ *Corresponding Author Email : fatima.benrachi@umc.edu.dz*

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Abs. No: 155

Beta decay nuclear properties of A=74 Isobars

Fatima BENRACHI✉, Nadjet LAOUET

LPMPS Laboratory, Frères Mentouri Constantine-1 University, Constantine ALGERIA

ABSTRACT

A=74 exotic isotopes study, situated near region recently reported as a new island of inversion as type II of shell evolution beyond N=40, provide information about nuclear interaction, strength function on astrophysical processes path of both experimetal and theoretical research. In this work, we have estimated the Gamow-Teller beta decay properties of these A=74 isobars. Also, we have performed shell model calculations by means of NushellX@MSU nuclear structure code in the full model space consisting of the (f7/2, p1/2, p3/2 and g9/2) proton and neutron orbitals. The calculations included few valence proton and neutron particles in addition to 56Ni doubly magic core. The Hamiltonian deduced from Bonn-C potential have been modified in this region assuming mass dependence effect. The gotten results are in good agreement with the known available experimental data.

Keywords: *56Ni core, A=74 neutron-rich isobars, NuShellX@MSU nuclear structure code, Gamow-Teller decay*

✉ *Corresponding Author Email : fatima.benrachi@umc.edu.dz*

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Abs. No: 156

Improving the performance of a liquid micro mixer for different viscosity values

Brahim DENNAI✉, Abdelhakim BENALI, Rachid KHELFAOUI, Abdellah BENSLIMANE
Faculty of Exact Sciences, University of Tahri Mohammed, Béchar-ALGERIA

ABSTRACT

This work is carried out within the MAST team (Micro-fluidics applied to thermal systems) of the ENERGARID laboratory (Energetics in Dry Area), University of Tahri Mohammed Bechar, Algeria. Our team works on several lines of research on microfluidics. Control and simulation of liquid and gaseous flows in micro-channels, production of micro- drops, separation of microparticles and liquid or gas micros mixer.

This work is devoted to the study of liquid micro mixer. These devices are intended for many microfluidics applications. Obtaining an efficient micro mixer at the miniature scale is often a bit difficult and especially for liquids with a slightly high viscosity value. Among the solutions proposed in the literature to overcome this problem is the use of a pulsed secondary flow to destabilize the diffusion layer between fluids to be mixed. This layer can subsequently stretched and folded, leading to an improved chaotic mixture [Arash Dodge et al., 2004]. However, this technique requires specific actuation, which makes the microsystem more complex and knifes. In this paper, we will proceed to new techniques to improve mixing efficiency at the output of the micro mixer, which do not require an outside force or a disturbance action to destabilize the diffusion layer. So the main objective of this work is to search, simulate and control micro mixer geometries suitable for liquids with different viscosity values, and improving these performances. Several simulations have been performed; some simulations are presented in this work.

There are cases where difficulties have been found in mixing liquids (because of their viscosity). The solution we proposed was the optimization of the simulated geometrical form.

Keywords: *Micro-oscillator, liquids micro-mixer, simulation, viscosity, performance.*

✉ *Corresponding Author Email : dennai.univ@yahoo.fr / dennai.brahim@univ-bechar.dz*

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Abs. No: 158

Numerical Fatigue Analysis of the Polyethylene Insert of a Total Knee Prosthesis

Hamza BENNACEUR[1]✉, Hacene AMEDDAH[2], Hammoudi MAZOUZ[3]

[1]Laboratory of Structural Mechanics and Materials (LaMSM), Batna 2 University, Mechanical engineering Department, Batna-ALGERIA

[2]Laboratory of Innovation in Construction, Eco-design, and Seismic Engineering (LICEGS), Batna 2 University, Mechanical engineering Department, Batna-ALGERIA

[3]Laboratory of Research in Productivity (LRP), Batna 2 University, Mechanical engineering Department, Batna-ALGERIA

ABSTRACT

Total knee prosthesis is used to treat severe cases of knee osteoarthritis, where the articular cartilage has deteriorated, causing pain and limited mobility. This prosthesis is designed to replace the articular surfaces of the knee, thereby restoring function and relieving pain. Fatigue from total knee prosthesis is a potential problem that can occur in some patients who have undergone knee replacement surgery. Although relatively rare, it can lead to disabling symptoms and require medical intervention. Our main goal of total knee replacement fatigue analysis work is to study and understand how total knee prosthesis performs under fatigue conditions using Polyethylene Insert. In this context, we used a numerical simulation under ANSYS workbench to carry out a static and dynamic study to determine the life cycle and damage of the Polyethylene Insert of a total knee prosthesis.

Keywords:*Biomaterials, Total knee prosthesis, Polyethylene Insert, Fatigue analysis.*

✉ *Corresponding Author Email : h.bennaceur@univ-batna2.dz*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)

27-30 October 2023, ANTALYA -TURKEY

Abs. No: 159

Experimental modal analysis of cantilever Euler-Bernoulli beam

Fatma Zohra TICHOUCHE[1], Abdelkader Djilali HAMMOU[1]✉, Belkacem KIRED[2], Gharbi ZAZA[2]

[1] Process engineering laboratory, mechanical engineering departement, Ammar Telidji university of Laghouat, ALGERIA

[2] Mechanical engineering departement, Ammar Telidji university of Laghouat, ALGERIA

ABSTRACT

The main of this work is the experimental modal analysis to verify the theory of transverse vibrations of cantilever Euler-Bernoulli beams by determining the natural frequencies by changing the dimensions of the beams and the study the effect of the sensor mass and its location on the natural frequencies. For this, we carried out experimental dynamic tests to extract the first three natural frequencies; these are compared with the analytical study according to the theory of transverse vibration of Euler-Bernoulli. These tests are executed on a different lengths of steel beams and different widths according to the boundary conditions (fixed at one end and free at the other with sensor fixed at different positions for modal analysis). The comparison of the experimental results with analytical results; reveals that the accuracy of the analytical natural frequencies are affected by the variation in beam length and width and that they are affected by the sensor mass and its location. It is found that the location of the sensor to give the values of the closest experimental and analytical frequencies is at the sensor position at the fixed end and at the modal nodes of the beam.

Keywords: *Naturel frequency; Theory of transverse vibration; Modal analysis*

✉ *Corresponding Author Email : a.hammou@lagh-univ.dz*

Abs. No: 160

Dear Prof.Dr.Ulviye Bunyatova

I am pleased to inform you that your paper detailed below has been accepted after peer review processes for presentation in ICCESEN-2023 and it will be published in abstract book. The conference will be taken place in Kemer-Antalya (TURKEY) during the period of 27-30 October 2023.
I thank you very much for your interest to ICCESEN and I look forward to see you in Kemer-Antalya-TURKEY.

Title: Pathogen detection in biological media using a new bio-sensing device

Theme: 6
Abstract No: 160

Presentation type: oral

Sincerely yours,

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)

27-30 October 2023, ANTALYA -TURKEY

Abs. No: 161

Issues of PORT and PICC vascular access devices

Kateřina HORÁČKOVÁ✉, Helena ČERNOCKÁ

University of Pardubice, faculty of Health studies, Nursing Department, Pardubice, CZECH REPUBLIC

ABSTRACT

PORT and PICC vascular access devices offer an innovative solution for providing venous access for patients in need of longer-term therapy. Such patients include cancer patients, patients requiring parenteral nutrition, pain management and others.

This paper addresses issues of PORT and PICC vascular access devices, both from the perspective of the medical staff and the patients themselves. The research aims to analyse and compare the advantages and disadvantages of the different vascular access devices and discuss their specific characteristics. Predominantly, the comparison deals with limitation factors, discretion, time requirements and patient satisfaction.

Most of the disadvantages reported by the respondents can be reduced by the quality education of patients, their relatives and health professionals. Patients with an indication for a PORT catheter often display reluctance. However, a PICC line presents multiple disadvantages for patients. The time that patients spend visiting the haematology outpatient clinic for dressings could be reduced by universal training of nurses from GP surgeries so that patients could attend dressings on site rather than having to travel to a distant hospital. The reported disadvantages of fear of pulling out and issues of aesthetics could be minimised by spreading awareness of protective entry sleeves, which not only cover and fix the entry but also protect against infection.

Despite the disadvantages and limitations associated with PORT and PICC vascular access devices, the patients report satisfaction and would recommend it to other patients.

Keywords: *PORT, PICC, vascular access, life limitations, advantages, disadvantages, satisfaction*

✉ *Corresponding Author Email : katerina.horackova@upce.cz*

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Abs. No: 166

A facial recognition-based encryption technique based on chaos theory

Noubeil GUERMAT[1] ✉, Djamel HERBADJI[2], Abderrahmane HERBADJI[1,3]
[1] University of M'sila University, Department of Electronics, PO Box 166 Ichebilia 28000 Msila, ALGERIA
[2]Independent researcher, ALGERIA
[3]University of Setif-1, Department of Electronics, 19000 Setif, ALGERIA

ABSTRACT

We suggest a facial recognition-based encryption technique based on chaos theory products to increase the security and effectiveness of our encryption system. Key generation, face extraction, and encryption are the three processes in the procedure. Hashing is utilized to generate secret keys, and Histogram of Oriented Gradients (HOG) is employed to extract face data from the face image. The key stream created in the first step of the encryption process is applied, and the remaining keys are reduced using the semi-blocked product theory and XOR diffusion. In order to maintain algorithm security, the correlation of information across three channels is also taken into account. This technique is employed in a variety of settings, including some face-based access control systems and mobile phone facial recognition unlocking. According to the results, facial recognition-based image encryption is safe and simple to use.

Keywords: *Encryption, Chaos, Security*

✉ *Corresponding Author Email : noubeil.guermat@univ-msila.dz*

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Abs. No: 167

Investigation of the oxidation behavior of new generation zirconia (ZrO2) based thermal barrier coating (TBC) systems stabilized with calcium oxide (CaO)

Yasin OZGURLUK ✉
Bartin University, Vocational School of Health Services, Department of Medical Services and Techniques, Optician Program, 74110, Bartın, TURKEY

ABSTRACT

Thermal barrier coating (TBC) systems are frequently used for thermal insulation purposes in many sectors with high-temperature applications, especially in the aviation, space, automotive, and maritime industries. Metallic bond coatings containing MCrAlY and zirconia-based ceramic top coatings are generally preferred in TBC systems, which consist of metallic bond coating on a superalloy substrate and a ceramic top coating on the bond coating. Considering the high- temperature operating conditions, different damage mechanisms such as hot corrosion, oxidation, thermal shock, and solid particle erosion occur in the TBC systems used. In high- temperature operating conditions, however, the oxidation damage mechanism, which we describe as the damage caused by the oxygen element coming from the atmosphere, to the TBC system is the most important damage that cannot be avoided. In this study, a new generation TBC system was produced, which was deposited with a metallic bond coating containing CoNiCrAlY on Inconel 718 nickel-based superalloy substrate, and a CaO-ZrO2 ceramic-based top coating on the bond coating by thermal spray coating methods. The produced TBC systems were subjected to isothermal oxidation tests at 650° C for 8, 24, 50, and 75 hours. The oxidation behavior of TBC systems was evaluated with SEM, XRD, and elemental mapping analyses obtained before and after oxidation.

Keywords: *Thermal barrier coating (TBC) 1, CoNiCrAlY 2, Oxidation 3, CaO-ZrO2 4*

✉ *Corresponding Author Email : ozgurlukyasin@gmail.com*

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Abs. No: 170

The Hardness and Microstructure Properties of Zn-Mg-Ca Alloys

Ahmed Mohamed Khalafallah ABDALAZIZ, İsmail Hakkı KARA ✉
Karabuk University, Metalurgy and Materials Department, Karabuk-TURKEY

ABSTRACT

In this study, the production of Zn-Mg-Ca alloys was accomplished using conventional gravity casting. The produced alloys were exposed to different homogenization heat treatment parameters containing 250 and 300 °C 4,8,12, 24 ve 48 hours. The brinell hardness measurement was utilized to investigate the hardness values and the yield strength of materials was evaluated. The highest and lowest hardness were compared by the microstructure properties based on light optical and scanning electron microscopy. XRD results showed different phase types influenced the hardness values directly.

Keywords: *Zinc alloys, Hardness, Homogenization, Microstructure*

✉ *Corresponding Author Email : ihakkikara@karabuk.edu.tr*

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Abs. No: 171

An investigation of the effect of chromium oxide additives on zinc phosphating of steel fasteners

Etkin CAN[1,2] ✉, Metehan ATAGÜR[1,3]
[1] Norm Coating/Uysal Makina SAN. İTH. İHR. ve TİC. A.Ş, İzmir, TURKEY
[2] İzmir Katip Çelebi University, Materials Science and Engineering Department, İzmir, TURKEY
[3] İzmir Katip Çelebi University, Metallurgical and Materials Engineering Department, İzmir, TURKEY

ABSTRACT

Zinc phosphating is an extensively used process as an anti-corrosion coating and adhesion-providing layer, exclusively in fasteners used in the automobile industry. Yet, due to the zinc phosphate coatings' porous nature the corrosion resistance of phosphate coatings is below expectations. Therefore, it is necessary to conduct research on additives that can improve the corrosion resistance of the phosphate coating.

In this study, chromium (III) oxide (Cr2O3) with different concentration was added as a corrosion inhibitor to improve the phosphate crystal formation and the corrosion behavior of phosphate coating on steel. The phase formation of the phosphate coatings was analyzed by X-ray diffraction analysis (XRD). The effect of chromium (III) oxide additive on the coating microstructure was observed by scanning electron microscopy (SEM). Coating thickness and elemental composition for each specimen was evaluated by X-ray fluorescence technique. Potentiostatic polarization test was performed to understand the effect of additives added at different concentrations (0-1 g/L) on corrosion resistance.

Keywords: *Phosphate coating; Chromium (III) oxide; Corrosion.*

✉ *Corresponding Author Email : etkin.can@normcoating.com, etkincan@windowslive.com*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)
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Abs. No: 172

Development of innovative fluoropolymer-based coatings to improve the surface properties of fasteners

Etkin CAN[1,2] ✉, Metehan ATAGÜR[1,3]
[1] Norm Coating/Uysal Makina SAN. İTH. İHR. ve TİC. A.Ş, İzmir, TURKEY
[2] İzmir Katip Çelebi University, Materials Science and Engineering Department, İzmir, TURKEY
[3] İzmir Katip Çelebi University, Metallurgical and Materials Engineering Department, İzmir, TURKEY

ABSTRACT

Steel fasteners can be offered to the customer uncoated or marketed with various surface treatments such as polymer coating, zinc plating, galvanization, and chrome plating. These coatings in the market are applied not only to increase corrosion resistance, but also to provide different functions to the products. Topcoat chemicals used in fasteners are one of the best examples of this situation. Topcoat is often used as special requirements must be met that are not inherent in the base coat, such as the inclusion of pigments (e.g., black), high chemical resistance, low coefficient of friction and UV resistance.

In this study, a polyvinylidene fluoride (PVDF) based fluoropolymer composite solution was developed which is operatable for the dip-spin method. Fastener samples were coated with dip-spin method. ISO 4042 torque-tension test was performed to determine the coefficient of friction for each sample. The wettability behavior of the coating was analyzed by contact angle measurement. ISO 9227 salt spray test was performed to determine the red and white rust formation period.

Keywords: *PVDF Fluoropolymer solution Salt spray test Coefficient of friction.*

✉ *Corresponding Author Email : etkin.can@normcoating.com, etkincan@windowslive.com*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)
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Abs. No: 173

Investigation of the use of precious metal oxides in galvanic coating wastes as an innovative anti-corrosion filler by recycling

Metehan ATAGÜR[1,2] ✉, Etkin CAN[2,3]
[1] İzmir Katip Çelebi University, Metallurgical and Materials Engineering Department, İzmir, TURKEY
[2] Norm Coating/Uysal Makina SAN. İTH. İHR. ve TİC. A.Ş, İzmir, TURKEY
[3] İzmir Katip Çelebi University, Materials Science and Engineering Department, İzmir, TURKEY

ABSTRACT

Although there are many studies on the recycling and reuse of electroplating wastes in the literature, such recycling plants in industrial scale requires a large investment and often not feasible because it offers unprofitable outputs. According to the regulations, acidic or alkaline coating bath wastes are not disposed of without being neutralized due to their extreme pH values. Although these wastes are neutralized, they contain heavy metallic salts such as nickel, chromium, zinc, lead, and traces of organic and inorganic surface treatment chemicals. These chemicals in its content make electroplating waste extremely dangerous for humans and the environment. This study includes the recycling of precious metals in electroplating wastes (EW) as anti-corrosive pigments with a very simple extraction process. XPS and ICP-MS analyzes were performed on the electroplating waste samples we took from the zinc coating plant where the steel fasteners were plated. In line with the results, elemental zinc was detected at the rate of 60% in the waste sludge. The metal oxide mixture in the sludge was separated from the waste by a simple acid-base reaction. The composition of extracted metal oxide mixture was examined by XRD technique. These metal oxides were added in different proportions (0-10 wt. %) into a thermoset paint as an anti-corrosion additive. Polarization and salt tests were applied to each sample to understand their corrosion behavior. SEM images were examined to determine the particle sizes and pigment distribution of extracted metal oxides in the thermoset matrix.

Keywords: *Electroplating waste Recycling Anti-corrosive fillers.*

✉ *Corresponding Author Email : metehan26mmz@gmail.com, metehan.atagur@ikc.edu.tr*

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Abs. No: 174

Enhancing the electrical conductivity by graphene growing on nickel electroplated bolts by chemical vapor deposition (CVD) technique

Metehan ATAGÜR[1,2] ✉, Etkin CAN[2,3]
[1] İzmir Katip Çelebi University, Metallurgical and Materials Engineering Department, İzmir, TURKEY
[2] Norm Coating/Uysal Makina SAN. İTH. İHR. ve TİC. A.Ş, İzmir, TURKEY
[3] İzmir Katip Çelebi University, Materials Science and Engineering Department, İzmir, TURKEY

ABSTRACT

The increasing popularity of electric vehicles in recent years brings different demands in the automotive industry. Even the simplest components in EV such as bolts and nuts require new technologies to meet customer demands. Conductive coatings are one of the examples of such demands in order to get rid of the load accumulation that may occur inside the vehicle by grounding.

Thanks to the high electrical conductivity of copper, electrolytic copper plating process for fasteners is widely used for such applications. However, electrolytic copper coating brings disadvantages such as low corrosion resistance that brings fast darkening as a result of oxidation and galvanic corrosion that may occur due to the fact that the opposite part is a different metal.

In this study, graphene was grown on electrolytic pure nickel-plated bolts by chemical vapor deposition (CVD) method. RAMAN analyses were performed to confirm graphene formation on nickel-plated samples. Graphene coated samples were tested in Norm coating in electrically conductive SCANIA STD 4472 setup. To evaluate the corrosion resistance, ISO 9227 salt spray test was performed.

Keywords: *Graphene, Chemical Vapor Deposition (CVD), Electroplating.*

✉ *Corresponding Author Email : metehan26mmz@gmail.com, metehan.atagur@ikc.edu.tr*

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Abs. No: 175

Antioxidant in pharmacy

Nadia KHADER[1] ✉, Bahdja GUERFI[2]

[1] Biophysics laboratory, Faculty of Medicine, University Saad Dahlab of Blida 1. ALGERIA

[2] Medicinal Chemistry Laboratory , Faculty of Medicine, University Saad Dahlab of Blida 1. ALGERIA

ABSTRACT

BACKGROUND :

Free radicals, oxidative stress, and the consumption of antioxidants have become a subject of increasing interest in the field of health and well-being. Through this survey, we hope to provide information relevant on the antioxidants available in pharmacies, their galenic forms and their dispensing conditions, highlighting the importance of the pharmacist's role in the delivery of these molecules to guarantee their effectiveness.

METHODS :

The survey was conducted in a total of 120 pharmacies located in different regions and conducted within a specific time period, from 06/05/2023 to 29/05/2023.

The questionnaire likely contained a series of questions related to the study's objectives and the information being sought from the pharmacies and the public.

The questionnaire was carried out by "Google Forms", and the data was represented in the form of graphs (histograms, sectors, bars) using the software:

Microsoft Office Excel 2010.

RESULTS :

The results show a wide choice of antioxidant products in the pharmaceutical market (drugs and supplements), a great divergence in their dispensing criteria

and random consumption by self-medication without worrying about adverse effects.

CONCLUSION :

Antioxidants indeed play a crucial role in protecting our bodies against oxidative damage. Antioxidant supplementation may be needed especially for population with an unbalanced diet. As pharmacy professionals, it is our responsibility to provide accurate and evidence-based information to patients.

Keywords: *Oxidative stress, free radicals, antioxidants, self-medication.*

✉ *Corresponding Author Email : Khdaer_nadia@yahoo.fr*

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Abs. No: 176

Investigation of physical and mechanical properties of DLP 3D Printed TiO2/photosensitive resin composites

Boussaha BOUCHOUL[1] ✉, Leila LAMIRI[1], Mohamed HAMIDOUCHE[1], Abdelghani KENZOUR[1], Mohamed Tahar BENANIBA[2], Katib HAMLAOUI[1], Ouafia BELGHERBI[1]

[1] Research Center in Industrial Technologies CRTI, B.P.64, Cheraga 16014 Algiers, ALGERIA
[2] Laboratory of Multiphase Polymeric Materials (LMPMP), Faculty of Technology, Setif-1 University,19000 Setif, ALGERIA

ABSTRACT

The properties of objects produced by DLP 3D printing depend on the photosensitive resins formulation, the parameters of the printing process and the post-curing. In this work, specimens are printed from a photosensitive resin alone and loaded with different levels of TiO2, the printing orientation of the specimen and post-curing in the UV oven are studied. To understand the effect of TiO2, print orientation and UV curing, the 3D printed samples are characterized by various techniques such as Fourier transform infrared spectroscopy (FTIR), UV-Visible spectroscopy, tensile testing, and metallographic microscopy and shrinkage measurement. UV spectroscopy results show that absorbance decreases with increasing TiO2, while morphological observation by metallographic optical microscope indicates good dispersion of TiO2 in the resin. Tensile testing shows the effect of filler ratio, printing direction and UV curing on mechanical properties.

Keywords: *Additive Manufacturing (AM), 3D printing, Digital Light Processing (DLP), Titanium Dioxide (TiO2).*

✉ *Corresponding Author Email : B_Bouchoul@yahoo.com / B.Bouchoul@crti.dz*

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Abs. No: 177

Investigation Of Plasma Effect On The Properties Of Paper Containing Different Cellulose Types

Meral ÇOBAN UĞURDAN[1,3], Ayşe AYTAÇ [1,2] ✉
[1] Kocaeli University, Chemical Engineering Department, Kocaeli-TURKEY
[2] Polymer Science and Technology Department, University of Kocaeli, TURKEY
[3] Hayat Kimya San. A.Ş., Kocaeli-TURKEY

ABSTRACT

The objective of this study is an investigate the plasma application effects on cellulose fibers and hand-made papers. Two different types of cellulose fibers were used for this purpose. The first is long-fiber pine cellulose and the other short fiber eucalyptus cellulose. Hand samples made of eucalyptus and pine cellulose without plasma treatment were used as control samples. Plasma treatment was carried out under 89.2 kPa vacuum with 100 kHz radio frequency energy and at 0.6 L/min flow rate in air. The samples were treated on both sides with radio frequency power of 200W for 1 minute, 200W for 2 minutes, 400W for 1 minute, 400W for 2 minutes, 800W for 1 minute, and 800W for 2 minutes. Hand sheet samples were prepared according to the Rapid-Köthen method, standard as ISO 5269-2:2004 Pulps — Preparation of laboratory sheets for physical testing. Fiber analyzes of cellulose were made with a Fiber Tester Plus fiber analyzer according to ISO 16065-1:2014(en) standard. The drainage property of the pulp suspension prepared according to the standard was determined in the Schopper-Riegler device in accordance with the ISO 5267-1:2011 Schopper-Riegler (°SR) standard. The tensile properties of the samples were tested according to the ISO 12625- 3:2014 standard. The water absorption capacity of the paper samples was determined by the basket dipping method according to the ISO 12625-8 standard. The highest water absorption capacity compared to the sample weight was measured in the 200W 2min plasma treatment sample and it is 351%. The general trend in dry tensile strength tends to decrease in plasma applied short cellulose type.

Keywords: *plasma, plasma treatment, cellulose, eucalyptus, pine*

✉ *Corresponding Author Email : aaytac@kocaeli.edu.tr*

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Abs. No: 178

Exploring MOND Theory in the Context of Fermionic q-Deformation: A New Approach to Modified Gravity

Mustafa SENAY ✉
Bartın University, Department of Medical Services and Techniques Department, Bartın-TURKEY

Abstract

In this study, we propose an investigation of the relationship between the MOND theory and the holographic principle using the q-deformed theory. At the beginning, we give a brief overview of Verlinde's entropic gravity assumption, which states that gravity can be understood as an entropic force arising from the statistical mechanics of quantum fields. We introduce some thermostatistical properties of a q-deformed fermion gas model in two-dimensional space. We also focus on the low-temperature limit and study the effects of fermionic q-deformation on MOND theory, Tully-Fisher relation, and Friedmann equation.

Keywords: *q-deformed, Friedman equation, MOND theory*

✉ *Corresponding Author Email : msenay@bartin.edu.tr*

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Abs. No: 180

Production And Characterization Of Electrical Conductive Polymeric Hybrid Composites Containing Organic And Inorganic Materials

Kutlay SEVER[1] ✉, Hüseyin YILMAZ[1], Metehan ATAGÜR[2]
[1]İzmir Katip Çelebi University, Mechanical Engineering Department, İzmir-TURKEY
[2]İzmir Katip Çelebi University, Metallurgical and Materials Engineering Department, İzmir-TURKEY

ABSTRACT

Polymer composites are becoming more and more involved in the many industries such as aerospace, automotive, transportation and sports. As usage increases in the commercial market, the polymer industry provides materials to almost every area of technology and industry, allowing the production of materials or new materials to be produced and the development or orientation of new types of needs. In the last 10 years, the use of polymer composites has become the new materials needed in electronic technology.

The aim of this study is to investigate the effects of polypropylene (PP) on mechanical and conductivity properties by using mica (M) as an inorganic filler and carbon nanotube (CNT) as an organic filler. Before hybrid composite materials were produced, firstly polypropylene (PP) and M- PP composites were produced and composite with the best mechanical properties were selected. PP-M composites were produced by using a thermokinetic mixer with the addition of mica in 10%, 20%, and 30% weight ratios. Hybrid composites were manufactured using CNT addition into PP- 20M with %1, %3, %5, and %7 weight ratios. Mechanical properties of the composite materials produced using tensile and three-point bending tests and viscoelastic properties by dynamic mechanical analysis (DMA), thermal properties by differential scanning calorimeter (DSC) and thermogravimetric (TGA) analyses and morphological structures by scanning electron microscopy (SEM) were investigated.

Keywords: *mica, carbon nanotube, hybrid composite*

✉ *Corresponding Author Email : kutlay.sever@ikcu.edu.tr*

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Abs. No: 181

A Study on Production of Polypropylene Matrix Biocomposite Using Sugar Beet Pulp Particles

Barış GÖKDEMİR[1], Kutlay SEVER[1] ✉, Metehan ATAGÜR[2]
[1] *İzmir Katip Çelebi University, Mechanical Engineering Department, İzmir-TURKEY*
[2] *İzmir Katip Çelebi University, Metallurgical and Materials Engineering Department, İzmir-TURKEY*

ABSTRACT

Agricultural production plays a major role in the income and production resources of our country. However, agricultural wastes are also produced on a large scale. After the sugar production process from sugar beet, sugar beet pulp comes out as waste and is often used as animal feed or thrown away.

Polypropylene matrix biocomposites have been developed in order to reduce the amount of sugar beet pulp waste and to show that agricultural waste materials can be used in different areas. After being taken from the sugar production factory, the sugar beet pulp was dried and the dried pulp was mechanically ground. After the grinding process, different particle sizes were formed by sieving below 100μm and between 100-250μm. These particles were added to pure PP as filler in the range of 5%-20%. Mechanical and thermal properties of these biocomposites were investigated by using tensile tests, flexural tests, dynamic mechanical analysis (DMA), thermogravimetric analyzes (TGA), and differential scanning calorimetry analyzes (DSC). It was determined that as the amount of sugar beet pulp particles increased, the modulus of elasticity increased in PP matrix biocomposites. When TGA data of pure PP and biocomposites are compared, Tmax values of biocomposites were found to be higher. On the other hand, it was determined that the Tonset values of the biocomposites were lower.

Keywords: *sugar beet pulp waste, polypropylene, biocomposite*

✉ *Corresponding Author Email : kutlay.sever@ikcu.edu.tr*

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Abs. No: 182

Recycling of Gangue Mineral (Pasa) and Its Use in Filled Concrete

Gökhan BAŞMAN, Erdoğan KARİP ✉, Cengiz YAŞİN
Eti Krom INC.R&D Center, Elâzığ-TÜRKİYE

ABSTRACT

Aggregate is one of the most important raw materials used in areas such as concrete production, asphalt industry and filling raw material. Most of the aggregates are produced in aggregate quarries, sand and gravel beds. The remaining aggregates consist of recycling of industrial wastes (10%), slag and ashes and debris (8%), marine and industrially produced aggregates (4%). The aggregate industry plays a key role in the functioning of the construction industry's supply chain. However, the fact that natural aggregates are being depleted day by day has led to other aggregate types. Eti Krom Inc. is the world's largest marketable hard lump chrome ore producer. Gangue minerals (pasa) are the rocks that are obtained by the extraction of chrome ore and contain worthless minerals. While some of the gangue minerals (pasa) are returned to the mine, a large part of it creates a problem as worthless waste. In this study, it is aimed to use the gangue minerals (pasa), which is produced in mining activities in Eti Krom Plant, as an aggregate, in the filled concrete. Samples were prepared under laboratory and process conditions. The mechanical properties of the samples were analysed by water absorption, porosity, methylene blue and compressive strength tests. In addition, the characterization analyses of the samples were made with XRD, XRF and SEM/EDX analyses. As a result, it has been observed that the use of gangue minerals (pasa) as aggregate in the filled concrete can be used as an alternative to natural aggregate.

Keywords: *Filled Concrete, Chrome, Gangue Material (pasa), Aggregate*

✉ *Corresponding Author Email : erdogan.karip@etikrom.com*

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Abs. No: 183

Influence of precursor solution on the properties of Co3O4 thin films deposited by spray pyrolysis

Warda DARENFAD[1] ✉, Younes NEZZARI[1], Kamel MIROUH[1], Noubeil GUERMAT[2], Rayene MERAH[1]

[1] Laboratory of Thin films and Interfaces, University of Constantine 1, 25000 Constantine, ALGERIA

[2] University of M'sila University, Department of Electronics, PO Box 166 Ichebilia 28000 Msila, ALGERIA

ABSTRACT

In this work, Co3O4 thin films were fabricated using spray pyrolysis with different precursors: cobalt chloride hexahydrate (CoCl2·6H2O), cobalt nitrate hexahydrate (Co(NO3)2·6H2O), and cobalt acetate (Co(CH3COO)2·4H2O). The objective was to investigate the influence of these precursor solutions on the properties of the Co3O4 thin films. Other experimental parameters such as molarity (0.1M), substrate temperature (400 °C), and deposition time (10 min) were kept constant. Raman results show the fives Raman active modes Eg, 3F2g and A1g of Co3O4. This confirms the Co3O4 spinel-like cubic structure for all as-deposited films where Co+2 and Co+3 occupy the tetrahedral and octahedral sites of Co3O4, respectively. All the deposited films exhibit p-type conductivity with a relatively high conductivity. The film synthesized with cobalt nitrate precursor seemed to possess promising optical and electrical properties for potential use in thin-film solar cell applications.

Keywords: *Thin films, Co3 O4 , Raman*

✉ *Corresponding Author Email : daranfed.warda@umc.edu.dz*

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Abs. No: 184

Evaluating structural, morphological, optical and electrical aspects of NiO/BiMnO3/FTO heterojunction

Warda DARENFAD[1] ✉, Noubeil GUERMAT[2], Kamel MIROUH[1], Younes NEZZARI[1], Rayene MERAH[1]

[1] Laboratory of Thin films and Interfaces, University of Constantine 1, 25000 Constantine, ALGERIA

[2] University of M'sila University, Department of Electronics, PO Box 166 Ichebilia 28000 Msila, ALGERIA

ABSTRACT

In this work, we have developed thin layers: FTO, NiO and BiMnO3. We have characterized these layers using various techniques such as X-ray diffractometer, Raman spectrometry, contact angle measurements, UV-Visible spectrophotometer, and two-point probe measurements. Based on the results obtained from optoelectronic characterization and their interpretations, we have concluded that the films are suitable for use in fabricating the NiO/BiMnO3 junction. The I(V) analysis of the NiO/BiMnO3/FTO structure showed a rectifying behavior with an ideality factor equal to 1.75. The heat treatments (annealing at 250 and 300

°C for 1 hour) considerably improved the electrical properties of the structure by reducing the reverse current and the series resistance of the structure. These improvements are beneficial for achieving more efficient and reliable device operation.

Keywords: *Thin films, NiO/BiMnO3 /FTO, Annealing temperature*

✉ *Corresponding Author Email : daranfed.warda@umc.edu.dz*

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Abs. No: 187

Pseudopotential Analysis of Refractive Index and Dielectric Constants in ZnxCd1-xS semiconductor ternary alloys

Fadila MEZRAG[1,2] ✉, Nadir BOUARISSA[1,2], Nor El Imane BEDDAR[2], Nour El-Houda FARES[1,3], Fahima FARES[1,4]

[1] *Laboratory of Materials Physics and Its Applications, University of M'sila, 28000 M'sila, ALGERIA*

[2] *Physics Department, Faculty of Science, University of M'sila, 28000 M'sila, ALGERIA*

[3] *Department of Informatics, Faculty of Computer Science and Mathematics, University of Bordj-Bou-Arréridj, 34000, ALGERIA*

[4] *Electronics Department, Faculty of Science, University of Bordj-Bou-Arréridj, 34000, ALGERIA*

ABSTRACT

In this study, we examine the optical and dielectric properties of ZnxCd1-xS, a ternary alloy system in the zinc-blende crystal structure. To analyze these properties, we employ a pseudopotential model based on the virtual crystal approximation, which takes into account the compositional disorder effect. Through our calculations, we explore various aspects of the refractive index and identify the most suitable model. Additionally, we determine the high- frequency and static dielectric constants for the materials of interest. Our results exhibit a satisfactory agreement with previously published findings in the literature. These findings provide valuable insights for the application of these data in optoelectronics and offer useful information for further studies in this field.

Keywords: *Band structure, Refractive index, dielectric constant, Znx Cd1-x S alloys.*

✉ *Corresponding Author Email : fadila.mezrag@univ-msila.dz*

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Abs. No: 188

Quantum Confinement Effects on Energy band Gaps in II-VI Semiconductor Quantum Dots: A Study of MgSe, CdTe, ZnS, ZnSe, and ZnTe

Fadila MEZRAG[1,2] ✉, Nadir BOUARISSA[1,2], Lakhal LYNDA[1,2], Nour El-Houda FARES[1,3], Fahima FARES[1,4]

[1] Laboratory of Materials Physics and Its Applications, University of M'sila, 28000 M'sila, ALGERIA

[2] Physics Department, Faculty of Science, University of M'sila, 28000 M'sila, ALGERIA

[3] Department of Informatics, Faculty of Computer Science and Mathematics, University of Bordj-Bou-Arréridj, 34000, ALGERIA

[4] Electronics Department, Faculty of Science, University of Bordj-Bou-Arréridj, 34000, ALGERIA

ABSTRACT

This study explores the influence of quantum confinement on the energy band gaps of spherical II-VI semiconductor quantum dots in the zinc-blende phase, specifically focusing on MgSe, CdTe, ZnS, ZnSe, and ZnTe. By employing the empirical pseudopotential approach, the research investigates how the size of the quantum dots affects both the direct and indirect energy gaps, and examines their relationship with the network parameter. The results demonstrate that quantum confinement leads to a substantially larger fundamental energy gap compared to that observed in bulk materials. In essence, this study sheds light on the profound impact of quantum confinement on the electronic properties of semiconductor quantum dots, highlighting their potential for various technological applications.

Keywords: *Band gap energy, II-VI semiconductors, Quantum dots.*

✉ *Corresponding Author Email : fadila.mezrag@univ-msila.dz*

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Abs. No: 189

Elaboration of SnO2 metal oxides for PLA polymer reinforcement

Fayssal BOUFELGHA[1,2] ✉, Rahima ZELLAGUI[1], Mohamed Cherif BENACHOUR[1], Heider DEHDOUH[1], Noureddine BRIHI[2], Slimene HADJEB[2].

[1] Research Center in Industrial Technologies CRTI, P.O.Box 64, Cheraga 16014, Algiers, ALGERIA

[2] Laboratoire Physique de la Matière Condensée et Nanomatériaux (LPMCN), Département de Physique, Faculté des Sciences Exactes et Informatique, Université de Jijel, 18000 ALGERIA

ABSTRACT

Additive manufacturing is a new technology based on the production of complex parts from digital files. In this technique, several materials can be used such as polymers (PLA for example), Because of the specific characteristics required for parts, the properties of the materials used for the production of these parts require improvements (such as reinforcement by adding reinforcements). In the present work we prepared the SnO2 powder (to use it as a reinforcement in the future). The prepared SnO2 powder was characterized by XRD, absorbance and FTIR. The results obtained show good crystallization and good absorbency of the prepared SnO2 powder.

Keywords: *Powder, SnO2, FTIR, additive manufacturing, Polymer (PLA).*

✉ *Corresponding Author Email : f.boufelgha@crti.dz, boufelghalem@yahoo.fr*

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Abs. No: 191

Analytical solution for free vibration analysis of graphene-reinforced porous FGM beams under different boundary conditions

Amale MAHI ✉, Abdellah HASSAINE
University of Blida 1, Institute of Aeronautics and Space Studies, Laboratory of Aeronautical Sciences, Blida- ALGERIA

ABSTRACT

In the present paper, an analytical method is presented for the analysis of free vibrations of porous FGM beams reinforced by GPLs. The formulation used is based on a strong unified higher order shear deformation theory. The material properties of the matrix vary continuously through the thickness.The beam has micro-scale porosities and is reinforced with graphene platelets to improve its mechanical properties. The effective Young's modulus, Poisson's ratio and density of the beam are calculated using the Halpin-Tsai micromechanics model and the mixing rule respectively. The equations of motion are derived using Hamilton's principle and the frequency equations are obtained by analytically solving the governing differential equations for different boundary conditions. Thanks to the proposed analytical procedure, a parametric study is carried out to check the sensitivity of the frequencies to beam geometry, GPL distribution patterns, GPL weight fraction, porosity coefficients as well as to the different boundary conditions. All the results presented in this work can be used as a reference to check the accuracy of approximate numerical methods and to optimise the design of FGM beams for specific engineering applications.

Keywords: *FGM beam, Graphene platelets, Porosities.*

✉ *Corresponding Author Email : amel.mahi@gmail.com*

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Abs. No: 192

An accurate analytical approach for the free vibration analysis of CNT- reinforced porous composite beams under different boundary conditions

Amale MAHI ✉, Abdellah HASSAINE
University of Blida 1, Institute of Aeronautics and Space Studies, Laboratory of Aeronautical Sciences, Blida- ALGERIA

ABSTRACT

In this research, an analytical approach is proposed to investigate the free vibrations of porous composite beams that are reinforced with carbon nanotubes (CNTRC). The theory employed in this study is based on a unified higher order shear deformation theory that is robust and reliable. The beam under consideration has micro-scale porosities and is strengthened with carbon nanotubes to enhance its mechanical properties. The effective material properties of the beam vary continuously along the thickness direction. The extended mixing rule is used to predict these properties. The governing differential equations are derived using the Hamiltonian principle, and the frequency equations are obtained by solving these equations analytically for different boundary conditions. The analytical method adopted in this study enables a parametric analysis to be performed to examine the sensitivity of the frequencies to various factors such as beam geometry, CNT distribution patterns, CNT volume fraction, porosity coefficients, and different boundary conditions. The results obtained in this study can be used as a benchmark to validate the accuracy of approximate numerical methods and to optimize the design of composite beams for specific engineering applications.

Keywords: *Composite beam, Carbon nanotubes, Porosities.*

✉ *Corresponding Author Email : amel.mahi@gmail.com*

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Abs. No: 193

The Use of Waste Crushing Stations in Road Construction

Idriss GOUAL ✉, Mohamed Kamel GUEDDOUDA, Mohamed Sayah GOUAL, Ahmida FERHAT

Civil Engineering Research Laboratory, University Amar Teledji. BP.37 G Laghouat - ALGERIA

ABSTRACT

This work focuses on the exploitation of local industrial waste and their use in the formulation of new material, which can be used in road engineering. The valorised material is limestone sand extracted from local crushing wastes. Therefore, this study constitutes an experimental work that aims to study, in the first part, the effect of addition of limestone sand on the physicomechanical behaviour of tuff-limestone sand mixture, and, in the second part, the effect of treatment with hydraulic binders on the mechanical behaviour of tuff-limestone sand mixture. To carry out this study, different proportions ranging from 0 to 50% of limestone sand and 4% 8% of hydraulic binders were considered. The results have been achieved on the compaction, bearing and compressive strength tests. They have permitted to select an optimal formulation composed from 80% tuff + 20% calcareous sand. Concerning the treatment, a significant improvement have been achieved on the mechanical behaviour of optimal mixture. Finally, the experimental approach revealed the possibility of the use of local materials containing tuff and quarry waste for the design of pavement and showed the interest of the treatment process with hydraulic binders which is necessary in order to mitigate the problems of non-stability in wet medium.

Keywords: *Tuff, calcareous sand, road engineering, compressive strength , hydraulic binders, crushing wastes*

✉ *Corresponding Author Email : i.goual@lagh-univ.dz / goualid74@gmail.com*

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Abs. No: 195

Field Tests on a Track Structure Equipped with Rail Dampers

Cezary KRAŚKIEWICZ ✉, Artur ZBICIAK, Przemysław MOSSAKOWSKI, Kacper WASILEWSKI, Andrzej DŁUGOŁĘCKI
Warsaw University of Technology, Faculty of Civil Engineering, Warsaw-POLAND

ABSTRACT

The evolution of railroad networks is a rise in train speed, which shortens journey times. However, higher velocities also cause more noise emissions to be released into the environment. The use of rail dampers is one potential strategy for reducing this issue.

Rail dampers are elements fixed on both sides of a rail that alter its overall dynamic properties, suppressing the sound wave being emitted. Dampers are elastic components that cover either fully or partially rail chambers and can include elements with a certain mass, such as steel inserts. The presence of rail dampers can improve the general dynamic characteristics of the rail system.

The paper focuses on field experiments oriented on the identification of dynamic characteristics of a track structure equipped with rail dampers, influencing the level of noise emission. Field tests conducted on the railway line sections allowed the authors to determine the track decay rate (TDR) of different setups and compare the results of rails equipped with dampers to one without. It was proved that TDR field tests make it possible to assess the dynamic characteristics of track structures, which could be used as a part of structural condition assessment. Moreover, the test results allow understanding and simulating the phenomena which cause noise emissions. The presented tests can be used not only for regular service assessment but also to investigate solutions aimed at the protection of people and environment against noise from railway traffic.

Part of the research presented in the publication was carried out as part of the project "Innovative solutions of people and the environment protection against rail traffic noise". The project is co-financed by the European Union from the European Regional Development Fund under the Smart Growth Operational Programme and by PKP PLK S.A. within the framework of BRIK.

Keywords: *Impulse field test, Rail dampers, Track decay rate*

✉ *Corresponding Author Email : cezary.kraskiewicz@pw.edu.pl*

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Abs. No: 200

Comparative Benefits of Hybrid Treatment Planning Technique for Left-Sided Breast Cancer in Radiotherapy

Besim XHAFA[1], Yllka KABASHI[2,3] ✉, Skender KABASHI[4]
[1] *Alma Mater Rezonanca, Campus College "REZONANCA", Prishtina, KOSOVO,*
[2] *Institute of Oncology, University Clinical Center of Kosovo, Prishtina, KOSOVO,*
[3] *University of Prishtina, Faculty of Electrical and Computer Engineering, Prishtina, KOSOVO,*
[4] *University of Prishtina, Faculty of Physics, Prishtina, KOSOVO*

ABSTRACT

Nowadays, radiotherapy stands as the primary medical treatment for around 50% of cancer patients. Breast cancer ranks among the most prevalent cancers affecting women. In breast cancer treatment planning, it is crucial to minimize the number of monitoring units (MU) used per fraction while delivering the prescribed dose in the shortest time possible. Unfortunately, during breast cancer irradiation, some challenges arise, such as the potential irradiation of part of the lungs with the prescribed dose intended for the target volume (PTV), or the risk of leaving parts of the PTV unirradiated. These complexities become even more pronounced in left-sided breast cancer cases, as exposure to ionizing radiation also affects the lungs, contralateral breast, and heart.

Currently, Intensity-modulated radiotherapy (IMRT) is a relatively advanced technique that offers better organ sparing. However, IMRT has a notable drawback: in certain cases, it requires an excessive number of MUs to deliver a dose of 1.8Gy, 2Gy, or 2.5Gy per fraction, extending the patient's treatment time and exacerbating the aforementioned issues during respiration. Additionally, achieving a 95% surface dose within the PTV can be challenging due to radiation fluence and gantry angle considerations, leading to fluctuations of up to 7 mm.

To address these challenges and provide a more effective solution, hybrid treatment techniques such as 3DCRT/IMRT or 3DCRT/VMAT have been introduced. These hybrid approaches significantly reduce the number of MUs required per fraction while ensuring a favorable dose distribution within the treatment plan.

Keywords: *Left-sided breast cancer, 3DCRT, IMRT, Hybrid treatment planning technique, DVH*

✉ *Corresponding Author Email : yllka.kabashi@uni-pr.edu*

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Abs. No: 202

Effect of Matrix Particle Size on the Mechanical Alloying Behavior of Tungsten Carbide Reinforced Copper Based Composite Powder

Serkan BIYIK ✉
Karadeniz Technical University, Abdullah Kanca Vocational School, Department of Machinery and Metal Technologies, Trabzon-TURKEY

ABSTRACT

In this study, the effect of matrix particle size and milling time on the synthesis and characterization of tungsten carbide (WC) reinforced copper (Cu) based composite powder was investigated. For this purpose, Cu powders having two different particle sizes were chosen as matrix materials. WC reinforcement was added separately to these different sized matrix materials. These prepared mixtures were then milled in a planetary type ball mill to achieve homogeneously mixed composite powders. Characterization of starting and milled powders was carried out using scanning electron microscopy (SEM) and laser diffraction analysis (Mastersizer). Final powder particle sizes were significantly changed depending on the starting materials. Taking into account the evolution of powder morphologies and particle sizes; optimal milling duration to produce Cu-WC composite powder was determined.

Keywords: *Composites, copper-based electrical contact materials, mechanical alloying, particle size, powder technology, tungsten carbide.*

✉ *Corresponding Author Email : serkanbiyik@ktu.edu.tr*

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Abs. No: 203

Synthesis and Characterization of Y2O3-doped Nanocrystalline Ag-ZnO Electrical Contact Material via Ball Milling

Serkan BIYIK ✉
Karadeniz Technical University, Abdullah Kanca Vocational School, Department of Machinery and Metal Technologies, Trabzon-TURKEY

ABSTRACT

This study investigated the effects of Y2O3 dopant and milling duration on the synthesis and characterization of Ag-ZnO electrical contact material produced by ball milling technique. For this aim, powder mixture containing elemental silver (Ag), zinc oxide (ZnO) and yttrium oxide (Y2O3) was milled in a planetary type ball mill. Stearic acid was also added to the powder mixture as a process control agent (PCA) to minimize the effect of cold welding. Scanning electron microscopy (SEM) and laser diffraction analysis (Mastersizer) were performed to characterize both starting and milled powders. Some fluctuations in powder particle size were observed in the early stages of milling. During further milling, fracturing event dominates the process. Fine and homogeneous dispersion of constituent powder particles is important to design new materials having superior physical and mechanical properties as compared to conventional materials. On the other hand, prolonged milling appears to cause an increase in powder contamination, which may be not favorable for applications of electrical contact materials. Therefore, optimum milling duration to achieve nanocrystalline composite powder was determined.

Keywords: *Ball milling, composites, silver-based electrical contact materials, powder technology, yttrium oxide, zinc oxide.*

✉ *Corresponding Author Email : serkanbiyik@ktu.edu.tr*

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Abs. No: 204

Numerical heat transfer of rectangular fins for different conditions validated by an experimental part

Imene BENNIA✉, Seddik HADDOU, Samah LOUNIS

Institute of Aeronautics and space studies, University of Blida1, Po Box 270 Road of Soumaa, Blida, 09400, ALGERIA.

ABSTRACT

The objective of this work is to contribute to the development of a computer code which determines the temperature field on fins with rectangular geometry and validate these results with experimental results.

This developed heat transfer code was used to investigate the effects of thermo-physical parameters on the fin temperature distribution. The finite volume method is used for the discretization of the governing equations. The experimental part consists of measuring the temperature on the fins and capturing this data by computer using electronic sensors. The experimental results are in agreement with the numériques results. The different results obtained show that, the fin temperature increases with increasing temperatures chosen as boundary conditions, with the addition of heat flux and with the use of a heat source. By increasing the thermal conductivity one converges more quickly towards the stationary solution. The use of a small epsilon ensures convergence in the case of a mesh refinement (ξ=10−11).

Keywords: *Rectangular fins, heat transfer, finite volume methods, numerical methods, experimental test.*

✉ *Corresponding Author Email : ibennia@yahoo.fr*

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Abs. No: 206

Improved Autoencoder Neural Network For Medical Image Denoising

Ismail BOUCHERIT[1] ✉, Mohamed OULD ZMIRLI[1], Dalila BOUCHERIT[2]

[1] Research Laboratory in Advanced Electronics Systems LSEA, Electrical Engineering Department. Yahia Fares University, ALGERIA

[2] Laboratoire Matériaux et Environnement, LME. Faculté des sciences et de la Technologie, Université de Médéa, ALGERIA

ABSTRACT

We Image denoising is one of the hardest issues in the world of digital image processing. It is crucial to maintain the diagnostically important information while improving the perceived quality of images when processing medical imaging. The capability of a neural network framework for medical picture denoising is examined in this paper. In particular, the peak signal-to-noise ratio and mean squared error are used to evaluate the performance of the suggested image-denoising approach on a medical database. The findings indicate a 9% increase in PSNR.

Keywords: *Medical image, Image denoising, Deep learning*

✉ *Corresponding Author Email : boucheritg@gmail.com*

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Abs. No: 207

Evaluation of the nucleating effect of pumice on the mechanical and thermal properties of polypropylene

Yasin OZDEMIR[1] ✉, Kutlay SEVER[1], Metehan ATAGÜR[2]
[1] Izmir Kâtip Celebi University, Mechanical Engineering Department, Izmir-TURKIYE
[2] Izmir Kâtip Celebi University, Metalurgical and Materials Engineering Department, Izmir-TURKIYE

ABSTRACT

In recent years, some inorganic materials, known as nucleating agents, are added to polymers to increase crystallinity and shorten cycle times. Examples of inorganic nucleating agents are calcium carbonate, talc, silica, mica, and wollastonite. Although it is less expensive than the majority of common particle fillers, the use of pumice powder as a nucleating agent in polypropylene has not been investigated in the literature.

In this study, we examined the effects of pumice powder as a nucleating agent on the mechanical and thermal properties of polypropylene (PP). The composites were manufactured by mixing different weight fractions of pumice powder into PP matrix using a twin screw extruder and injection molding. Impact test, Heat Deflection Temperature (HDT), Differential Scanning Calorimetry (DSC) and X-Ray Diffraction (XRD) analysis were carried out to evaluate the nucleating effect of pumice powder on the mechanical and thermal properties of polypropylene. The study shows that the nucleating effect of pumice partially increased the thermal and mechanical properties of polypropylene.

Keywords: *Pumice, Nucleating Agent, Polypropylene (PP)*

✉ *Corresponding Author Email : yasin0433@gmail.com*

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Abs. No: 208

Investigation of Mechanical and Thermal Properties of Pumice Powder Filled Polypropylene Composites

Yasin OZDEMIR[1] ✉, Kutlay SEVER[1], Metehan ATAGÜR[2], Ibrahim SEN[3]

[1] *Izmir Kâtip Celebi University, Mechanical Engineering Department, Izmir-TURKIYE*

[2] *Izmir Kâtip Celebi University, Metalurgical and Materials Engineering Department, Izmir-TURKIYE*

[3] *Bursa Technical University,Central Research Laboratory Bursa-TURKIYE*

ABSTRACT

Inorganic materials have recently become popular as fillers to improve technical qualities and minimize the cost of the finished product. Although pumice powder is less expensive than most typical particle fillers, its use as a reinforcing material in composites has not been researched in the literature. Consequently, in this study, we examined the thermal and mechanical properties of polypropylene (PP) composites utilizing pumice powder made by grinding pumice from Uşak regions of our country. Using a twin screw extruder and injection molding, the composites were produced by incorporating different weight fractions of pumice powder (0.1, 0.2, 0.3 wt%) into PP. While tensile,flexural and impact tests were used to evaluate the mechanical properties of the composites, thermogravimetric and differential scanning calorimetry analyses were used to determine the thermal properties of the composites.

Keywords: *Pumice, Polypropylene (PP), Tensile Test, I*

✉ *Corresponding Author Email : yasin0433@gmail.com*

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Abs. No: 212

The Antioxidant Activity Evaluation of the olive leaf extracts using experimental design

Souad TOUAZI ✉, Naila ALLACHE, Naila LASSOUANI
Laboratoire de Valorisation des Energies Fossiles (LAVALEF), Département de Génie Chimique, Ecole Nationale Polytechnique d'Alger, ALGERIA

ABSTRACT

Algeria is one of the olive-growing countries where it is used in many ways and in many fields. Olive leaves are one of the by-products of the olive industry. Therefore, they are a cheap raw material known for its antioxidant properties.

This work is devoted to study of the antioxidant activity of the alcoholic extracts of Olea europeae L. using the experimental design. The methodology is based on the development of a mathematical model, by full factorial design at two levels considering four factors. Variables such as extraction temperature (X1), solid/solvent ratio (X2), water/ethanol ratio (X3) and extraction time (X4) were selected as the independent variables, and antioxidant activity was taken as the response of the design experiments (Y).

The statistical analysis of the experimental results showed that the final polynomial equation, representing the antioxidant activity as a function of the significant effect, gave a reasonably good fit with an R2 value of 0.955. By response optimizer graph plot, the best response value of antioxidant activity was acquired.

Keywords: *Antioxidant activity, Olive leaves, Extraction*

✉ *Corresponding Author Email : souad.touazi@yahoo.fr souad.touazi@g.enp.edu.dz*

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Abs. No: 213

Creep and Shrinkage Strains for repaired Beams from Self-Compacted Concrete (SCC)

Hajdar SADIKU, Mazllum KAMBERI ✉, Florim GRAJÇEVCI
University of Prishtina ''Hasan Prishtina'', Faculty of Civil Engineering, Prishtinë-Republic of KOSOVA

ABSTRACT

With the passage of time, the need arises that many different objects built earlier need to be reinforced as they must be harmonized with the current standards.

One of the possibilities of reinforcing structural elements from reinforced concrete is to increase the dimensions of the cross-section, and this can be achieved very efficiently by using self-compacting concrete. But after the reinforcement, the structural element will consist of the old concrete, which has largely undergone the process of strains due to shrinkage and creep, as well as the fresh concrete, which will be in the initial phase of strains as a function of time.

In order to investigate such a phenomenon, we have developed an experiment for the investigation of creep strains, shrinkage strains, creep coefficient, deflections and cracks in the long-term process in reinforced concrete beams. In addition to a considered number of cubic, cylindrical and prismatic samples for determining the mechanical characteristics, three series of beams from ordinary concrete, self-compacting concrete and beams made from ordinary concrete and wrapped with self-compacting concrete were made.

This paper will present the experimental results for some of the mechanical characteristics of self-compacting concrete and ordinary concrete, the results of shrinkage strains and creep strains in ordinary concrete beams, in beams from self-compacting concrete and in beams reinforced with self-compacting concrete in the long term process.

Keywords: *Creep; Shrinkage; Self-Compacting Concrete; Conventional Concrete strains*

✉ *Corresponding Author Email : mazllum.ing@gmail.com*

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Abs. No: 216

Farklı Topolojilerde Sentetik Kabuk Veri Setleri Üzerinde K-Means Yönteminin Detaylı Performans Analizi

Feyza Nur ÖZDEN[1] ✉, Celal Onur GÖKÇE[2], Güray SONUGÜR[3]
[1] Mekatronik Mühendisliği, Afyon Kocatepe Üniversitesi, TÜRKIYE,
[2] Yazılım Mühendisliği, Afyon Kocatepe Üniversitesi, TÜRKIYE,
[3] Mekatronik Mühendisliği, Afyon Kocatepe Üniversitesi, TÜRKIYE.

ÖZET

Bu çalışmada kabuk tipi sentetik veri setleri üzerinde küme sayısı, kümeler arası boşluk, küme içi boşluk ve küme topolojisi gibi parametreler ile k-means kümeleme algoritmasının performans analizi yapılmıştır. Yüksek boyutlu gerçek veri setlerinde veri dağılımının kütlesinin çoğu merkezinin yakınında değil, etrafındaki kabuk kısmında olduğu için bu tip seçilmiştir. Sentetik veri setleri, gerçek verilerin benzer özelliklerine sahip, matematiksel yöntemler ile üretilen yapay veri setleridir. Gerçek veri setlerinin genellikle yüksek boyutlu olması ve güvenlik gibi bazı kısıtlamaları olması ile birlikte uygun olmadığı durumlarda sentetik veri setleri kullanılmaktadır. Bu nedenle sentetik veri seti ile algoritmaların değerlendirilmesi ve önerilen yöntemlerin performansının daha kolay analiz edilmesi amaçlanmıştır. Gerçekleştirilen deneysel çalışmalar ile k-means performansının küme sayısı, kümeler arası boşluk, küme içi boşluk ve küme topolojisi parametreleri ile ilişkisi gözlenmiş, sonuçlar grafik ve tablolar ile sunulmuştur.

Keywords: *Kümeleme, K-means, Kabuk veri seti*

✉ *Corresponding Author Email : feyzanurozden97@gmail.com*

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Abs. No: 218

Effect of number of passes on local mechanical properties of WM and HAZ sub-zones of the API 5L X70-pipeline weld joint

Bouzid MAAMACHE ✉, Brahim BELKESSA, Naima OUALI, Billel CHENITI
Research Center in Industrial Technologies CRTI, P.O. BOX 64, Cheraga 16014 Algiers ALGERIA

ABSTRACT

The current study focuses on investigating the evolution of microstructure and local mechanical properties in welded X70 pipeline steel. The variation in peak temperatures during the multiple welding passes led to heterogeneity in the microstructure between the cap and root regions of the weld zone. Additionally, significant phase transformations and grain size changes were observed in the heat-affected zone (sub-zones) due to the thermal cycles applied. Nano- indentation measurements revealed that the intercritical heat-affected zone (ICGHAZ) exhibited higher hardness and elastic modulus compared to the coarse-grained heat-affected zone (CGHAZ), which displayed the lowest values. The cap region displayed improved mechanical properties, with the acicular ferrite (AF), exhibiting the highest hardness and Young's modulus, whereas the root region, dominated by grain boundary ferrite (GBF) exhibited lower hardness. Furthermore, the higher presence of M-A compounds in the cap region, along with the significant phase transformations and grain size changes, indicated an enhancement in the mechanical behavior.

Keywords: *API X70 steel; weld repair; microstructure, local mechanical properties;*

✉ *Corresponding Author Email : Bouzid Maamache: (maamache2002@yahoo.fr)*

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Abs. No: 219

Interfacial evolution of WC-Co/AISI 304L diffusion bonded joint obtained by flash SPS technique

Billel CHENITI[1] ✉, Brahim BELKESSA[1], Bouzid MAAMACHE[1], Naima OUALI[1], Viktor PUCHÝ[2], Pavol HVIZDOŠ[2]

[1]Research Center in Industrial Technologies CRTI, P.O. BOX 64, Cheraga 16014 Algiers ALGERIA

[2]Institute of Materials Research, Slovak Academy of Sciences, Watsonova 47, 04353 Kosice, SLOVAK REPUBLIC

ABSTRACT

In this work, WC-Co cermet was successfully joined to AISI 304L stainless steel using flash spark plasma sintering (FSPS) technique under a constant load of 5 MPa with ultra-rapid holding times. The results revealed that increasing the holding time to 12s resulted in massive interfacial deformations accompanied with an important diffusion activity of Co, Ni and Fe across the interface. Toughness measurement of WC-Co cermet at the vicinity of the bonding interface was assessed using Vickers indentation fracture (VIF) method. The results revealed that the mechanical properties of the bonded joints deteriorated with increasing holding time, leading to increased brittleness. This outcome was observed despite the significant inter-diffusion that occurred between the WC-Co cermet and the constituents of the 304L steel.

Keywords: *WC-Co cermet, inter-diffusion, Flash SPS, Microstructure, Interface, Fracture toughness.*

✉ *Corresponding Author Email : Billel Cheniti: (ch.billel@gmail.com)*

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Abs. No: 220

Structural failures diagnosis in water networks Based on conditional probability theory

Abdelaziz LAKEHAL[1] ✉, Farouk MAHFOUDI[2]
[1]*University of Souk Ahras, Laboratory of Research on Electromechanical and Dependability,Souk-Ahras, ALGERIA*
[2]*University of Souk Ahras, Department of Mechanical Engineering,Souk-Ahras, ALGERIA*

ABSTRACT

Structural failures on the water pipeline network represent 53% of the causes of economic losses. To make the network profitable and minimize these losses, a diagnostic study is carried out based on the theory of conditional probabilities. A Bayesian probabilistic network is developed whose nodes represent the structural failures and their causes. In this study structural failures are considered as undesirable and dreaded events. From this study is easy to state that Bimetallic connections and degradation by aging of joints are the main causes of structural failures. An action plan is also determined from the inference in the developed Bayesian network. Actions are either: corrective actions, control and inspection actions, surveillance and monitoring. To show the effectiveness of the proposed tool, a case study on a water pipeline network is carried out. The actions taken in this paper's case study are: Remove or avoid metallic connections and Replace and repair joints, which represent mainly corrective actions. Other more complex probabilistic models will be developed in future work in order to take all failures on the water pipeline network.

Keywords: *Water network, Failures diagnsois, Bayesian network*

✉ *Corresponding Author Email : a.lakehal@univ-soukahras.dz, lakehal21@yahoo.fr*

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Abs. No: 221

Hydrodynamic Lubrication Analysis In Self-Lubricating Journal Bearings Using Power Law Fluid Model

Maamar MALKI[1] ✉, Sid Ali BOUBENDIR[2], Salah LARBI[3]

[1]LTI, Dept. GMP National High School of Technology Bordj El Kiffan, Algiers, ALGERIA

[2]USTHB, BP 32, El Alia, 16111 Bab Ezzouar, Algiers, ALGERIA

[3] LGMD, Polytechnic National School of Algiers 10, Avenue Hassen Badi, Algiers, ALGERIA

ABSTRACT

The effect of non-Newtonian lubricants behaviour using power law fluid model of self-lubricating porous journal bearings with sealed ends is analysed. The nonlinear Reynolds equation is derived by considering both the fluid flow in the porous matrix and the lubricant rheological behaviour where Darcy's law and power- law model were used. Governing differential equations were solved numerically using the finite difference method. Static characteristics are obtained by considering three types of lubricants: dilatant, pseudo-plastic and Newtonian fluids. Obtained results showed that the power law index has important effects on the performance of porous and non-porous bearings. An improvement in the fluid bearing characteristics (load capacity, pressure) is observed for dilatant fluids. The permeability of the porous structure has significant effects on the performance of porous journal bearings of finite length, particularly at higher eccentricity ratios.

Keywords: *Hydrodynamic lubrication, Porous journal bearing, Non-Newtonian fluid; Power law*

✉ *Corresponding Author Email : maamar.malki@enst.dz*

10th INTERNATIONAL CONFERENCE ON COMPUTATIONAL AND EXPERIMENTAL SCIENCE AND ENGINEERING (ICCESEN-2023)
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Abs. No: 222

Impacts on the modification of a two-blade mobile on the agitation of newtonian fluids

A. NEKROUF ✉, S.YOUCEFI
University of Science and Technology of Oran Mohamed Boudiaf, Department of Mechanical Engineering, Oran - ALGERIA

ABSTRACT

Fluid mixing plays a crucial role in numerous industries as it has a significant impact on the final product quality and performance. In certain cases, the circulation of viscous fluids presents challenges, leading to the formation of stagnant zones. To overcome this issue, stirring devices are employed for fluid mixing.

This study focuses on a numerical analysis aimed at understanding the behavior of Newtonian fluids when agitated by a two-blade agitator in a cylindrical vessel. We investigate the influence of the agitator shape on fluid motion. Bi-blade agitators of this type are commonly used in the food, cosmetic, and chemical industries to agitate both viscous and non-viscous liquids.

Numerical simulations were conducted using Computational Fluid Dynamics (CFD) software to obtain velocity profiles, streamlines, velocity contours, and the associated power number. The obtained results were compared with experimental data available in the literature, validating the accuracy of our numerical approach.

The results clearly demonstrate that modifying the agitator shape has a significant impact on fluid motion. This modification generates an axial flow that enhances the efficiency of the fluid flow. The various velocity results convincingly reveal that the fluid is more uniformly agitated with this modification, resulting in improved circulation and a substantial reduction in stagnant zones.

Keywords:*Newtonian Fluids, Numerical Modeling, Two Blade*

✉ *Corresponding Author Email : nekrouf.abderrahim18@gmail. com*

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Abs. No: 223

Microstructure And Mechanical Properties Of Saf 2205/Api X52 Steels Dissimilar Metal Joint Made By Rotary Friction Welding

Brahim BELKESSA ✉, Naima OUALI, Bouzid MAAMACHE, Billel CHENITI
Research Center in Industrial Technologies, CRTI, Algiers - ALGERIA

ABSTRACT

In this study, dissimilar Rotary Friction Welding of AISI 2205 duplex stainless steel to API X52 steel has been conducted using a direct-drive type friction-welding machine. Only, the friction time was varied, the others parameters were maintained constant.

The microstructures of the dissimilar metal joints have been investigated by optical microscopy, scanning electron microscopy and energy-dispersive spectroscopy (EDS).

Experimental results revealed that microstructural and mechanical properties are significantly affected by altering welding parameters.

The microstructural examination showed that the increase in friction time increases the grain size in both the heat-affected zone and amplifies the extent of the fully dynamically recrystallized zone.

The wide of flash increases with the friction time under constant rotational speed conditions. However, the diameters of the flash in the side of AISI 2205 steel were found to be bigger than the API X52 steel. This can be explained by the lower heat conductivity of the stainless steel than the low alloy steel.

The mechanical behavior investigated by nano-indentation and micro-hardness measurements revealed that, regardless the friction time effect and considering the SAF 2205 side, the highest hardness values were recorded in the fully dynamically recrystallized zone. Besides, the increase of friction time resulted in an increase of hardness of each zone in the 2205 duplex stainless steel side.

Keywords: *Rotary friction welding, friction time, microstructure, mechanical properties*

✉ *Corresponding Author Email : brbelkessa@yahoo.fr*

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Abs. No: 228

Impact Of Gallium Doping And Heat Treatment On Sprayed Alox Properties For Silicon Surface Passivation

Lyes ZOUGAR[1] ✉, N. BENTAIEB[2], Imen LARBI[2], Randa SOUICI[2], Samira SALI[1], Salim KERMADI[1],

[1] *Research Center in Semiconductors Technology for Energy (CRTSE), Division DDCS, 2, Bd Frantz Fanon, B.P 140 Algiers, ALGERIA*

[2] *Faculty of Mechanics, Houari Boumediene University, BP 32 El Alia, Algiers, ALGERIA*

ABSTRACT

Aluminum oxide (AlOx) thin films are used for the surface passivation of silicon solar cells. Films were deposited on p-type silicon crystalline by a spray coating. The beneficial and detrimental effects of gallium doping and heat treatment on the chemical properties and silicon surface passivation quality are analyzed. XPS analysis confirms the formation of AlOx and reveals a decrease in carbon contamination with increasing gallium doping and after thermal annealing. The Photoluminescence spectroscopy (PL) results indicate that the AlOx film deposited with the addition of higher amounts of gallium exhibits lower defects than other conditions, which offer excellent carrier lifetime improvements and the lowest surface recombination velocity (Seff). Spray coated gallium-doped aluminum oxide is a promising method for good surface passivation of p-type silicon solar cells.

Keywords: *Silicon, Aluminum oxide, Gallium, surface passivation, spray, solar cells*

✉ *Corresponding Author Email : zougarlyes@gmail.com*

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Abs. No: 229

Liquid-liquid extraction for quaternary systems: water+formic acid+acetic acid+heptane/hexane

Nadjet BOULKROUNE[1] ✉, Soumaya LAROUS[2], Lyna DJEBABLA[2], Rayen-Neoussem BOUDERSA[2], Hibat Allah-Nourhane BOUCHAIR[2]

[1] University Salah Boubnider Constantine 3, Chemical Engineering Department, Constantine-ALGERIA

[2] University Salah Boubnider Constantine 3 ALGERIA

ABSTRACT

Liquid–liquid equilibrium (LLE) data for the quaternary systems of [water + mixed solute: acetic acid + formic acid + solvent (hexane and/or heptane) was measured at 291.15 K and atmospheric pressure. Using composition of mixed solute equal to 1 in all extractions, binodal curves and tie-lines for the quaternary systems have been determined in order to investigate the effect of hexane and heptane used as solvent on extracting the mixture of acetic acid and formic acid from aqueous solution. The distribution coefficient and selectivity for the extraction of carboxylic acids were also obtained to evaluate the efficacy of the solvents. The reliability of the data was confirmed using the Othmer–Tobias and Hand equations. The results obtained show that hexane has a higher selectivity factor than heptane for the ternary case while for the quaternary systems a poor extraction was noted for the two solvents studied. The experimental liquid-liquid equilibrium data were correlated with the Non-Random Two Liquids NRTL model. The calculated values are found to be in close agreement with the experimental data.

Keywords: *Liquid-liquid extraction, Quaternary system, Selectivity curves*

✉ *Corresponding Author Email : boulkrounenadjet@yahoo.fr*

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Abs. No: 234

Application of Injection-Dependent Lifetime Spectroscopy for the determination of recombination activity of interstitial Iron in silicon wafers

Mohamed MAOUDJ ✉, Djoudi BOUHAFS

1 CRTSE, Research Center in Semiconductor Technology for the Energetic, Division of Development of Semiconductor Conversion Devices-DDCS. 02, Bd Frantz Fanon. BP 140, Alger 7 Merveilles, Algiers, ALGERIA

ABSTRACT

The aim of this work is the identification of active recombination defects in photovoltaic materials. For this purpose, we used the valuable method named, Injection-Dependent Lifetime Spectroscopy (IDLS). For samples containing defects, obeying Shockley-Read-Hall (SRH) statistics, it is possible to use the IDLS to determine the energy level within the band-gap and the constant of the capture cross-sections of electrons and holes k=σn/σp of these defects. This method is based on the minority carrier lifetime measurements. When a linear function of the ratio of the total electron concentration to the total hole concentration (X=n/p) for p or n type material is plotted on a linear scale, a single level defect, manifests itself as a straight line. The gradient and intercepts of τsrh = f(n/p) can be used to determine recombination parameters. In our study, we investigated the Iron (Fe) contamination as a lifetime-limiting defect center in p-type Czochralski <100> silicon wafers. It's well known that in the PV technology the temperature processing, leads to the dissolution of iron precipitates, generating interstitial iron (Fei), this latter bonds with boron and forms iron-boron pairs (FeB), known to be active recombination centers. The IDLS method backed by the Defect Parameter Solution Surface (DPSS) analysis permitted us to extract the electrical properties of the defect related to the (Fei). However, the fit of the experimental SRH curve based on the obtained parameters from IDLS technique, allowed identifying an energy level located at EV+0.38 eV with a σn/σp= 21, and a [Fei] concentration ~ 2 x 1012 cm-3.

Keywords: *Silicon, IDLS, interstitial iron.*

✉ *Corresponding Author Email : maomo72@gmail.com*

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Abs. No: 236

Liquid-liquid equilibrium for ternary systems: water/propanol/ n-hexane water/propanol/ ethyl acetate: Experimental and correlation data

Soumaya LAROUS[1] ✉, Nadjet BOULKROUNE[2], Samaher BEZICHE[2], Maissa BENSLIMANE[2]

[1] UniversitySalah Boubnider Constantine 3, Pharmaceutical Department, Constantine-ALGERIA

[2]University Salah Boubnider Constantine 3 ALGERIA

ABSTRACT

This work consists of studying liquid-liquid extraction as a method of separating and recovering propanol from aqueous solution. Two ternary systems were tested: water / propanol / n-hexane, and water / propanol / ethyl acetate at 291.15 K and atmospheric pressure. The liquid-liquid equilibrium data of these ternary systems, tie lines, were used to determine the distribution coefficients and the separation factors and to construct the distribution and selectivity curves which constitute the criterion for the choice of solvent. The results show that Ethyl acetate gave a high distribution coefficient and selectivity than n-hexane, indicating that this last is the most suitable for the separation of propanol from aqueous solutions in this study. Othmer-Tobias and Hand equations were used to determine the reliability of the experimental tie-line data (conodals). In addition, the non-random two-liquid (NRTL) model was used to correlate the experimental liquid-liquid equilibrium data. This model correlate well the obtained tie lines.

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Keywords: *Liquid-liquid extraction, Distribution coefficient, Distribution and selectivity curves*

✉ *Corresponding Author Email : larous_soumaya@yahoo.fr*

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Abs. No: 241

Study of the Tribomechanical Behavior Of Dynamic Copper-Steel And Brass- Steel Couples

Boubechou CHOUBEILA[1] ✉, Bouchoucha ALI[2], Zaidi HAMID[3]

[1] University of 20 August 1955, Skikda, Department of Mechanical Engineering, Faculty of Technology, ALGERIA

[2] University Constantine1, Department of Mechanical Engineering, Faculty of Science and Technology , 25000, Algeria, Mechanical Laboratory, ALGERIA

[3] University of Poitiers, LMS laboratory (UMR-6610-CNRS), SP2MI, Teleport 2, Boulevard Marie and Pierre Curie, BP 30179, 86962 Futuroscope Chasseneuil Cedex, FRANCE.

ABSTRACT

This study focuses on a comparative analysis of the tribomechanical behavior of dynamic copper-steel and brass-steel couples, as a function of the following functional parameters: normal force, sliding speed, contact mode and materials making up the tribosystem. For this purpose, friction and wear tests were carried out using a pin-disc tribometer, in an atmospheric environment. This consists of a copper or brass pin rubbing dry against a rotating steel disc. A Comsol Multiphysics numerical code was used to evaluate the mechanical stresses and strains at the interface of the couples.

The results obtained show that the heat generated by mechanical friction has a significant influence on the tribomechanical behavior of the two couples. Indeed, heat dissipation by sliding modifies the physicochemical and mechanical properties of the materials, and promotes the oxidation process. The discussion of the results is based on macroscopic and microscopic observations of the worn surfaces and the interfacial phenomena resulting from sliding.

Keywords: *Copper, Brass, Steel, Interface, Tribological behavior, Oxidation, Stress, Deformation.*

✉ *Corresponding Author Email : choubeila_boubechou@yahoo.fr*

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Abs. No: 245

Study of a Composite Material Reinforced of Strelitzia Reginae Fiber

Gheribi HASSINA ✉, Teyar SOUMIA, Belaadi AHMED
University August 20, 1955 -Skikda, Department of Mechanical Engineering, Skikda-ALGERIA

ABSTRACT

The natural fibers have many advantages compared to their synthetic counterparts: costs financier and environmental less, low density combined with satisfactory specific mechanical properties. The research tasks were undertaken to improve construction of composite materials reinforced by natural fibers used in various manufacture applications. Several parameters being able to influence the behavior of the composites has natural reinforcement; such as the orientation of fibers, the percentage in weight, the length of fibers, their orientations, the nature of the matrix…

In this context, this work is interested in the study of the mechanical properties of a biocomposite based on a natural fiber Strelitzia Reginae. The analysis of the behavior of material is based on the discussion of the results obtained following a test tensile for different percentage in weight from fibers.

Keywords: *Natural fiber, polyester matrix, mechanical behavior, biocomposite.*

✉ *Corresponding Author Email : gheribi_hassina@yahoo.fr*

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Abs. No: 246

Influence of The Matrix Nature on The Mechanical Properties of a Composite Material From the New Zealand Flax Fiber

Teyar SOUMIA ✉, Gheribi HASSINA, Belaadi AHMED
University August 20, 1955 -Skikda, Department of Mechanical Engineering, Skikda-ALGERIA

ABSTRACT

In light of the transition to a greener and more sustainable industry, natural fiber composite materials play a vital role in the field of mechanical engineering compared to traditional materials such as metals. They are experiencing increasing use due to their improved properties and favorable environmental impact. The natural fibers have many benefits, such as continuous supply, non-allergenic nature, and ability to break down easily.

In this context, this work focuses on the study and analysis of the mechanical behavior of different composite materials made from natural fibers. These studied materials are reinforced with New Zealand flax fibers with two types of matrix, namely polyester and HDPE polymer. The results obtained highlight the influence of the amount of reinforcement and matrices on the mechanical properties of composite materials, such as stiffness and hardness.

Keywords: *Natural Fiber, Polyester Matrix, HDPE Matrix, Mechanical Behavior, Composite Materials, New Zealand Flax.*

✉ *Corresponding Author Email : s.teyar@univ-skikda.dz*

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Abs. No: 248

Analysis of Miniaturized Circular Microstrip Antenna for 5G applications and Beyond

Linda DJOUABLIA[1,2] ✉, Ossama BOUAZIZI[1], Aziza ZERMANE[2,3]

[1] Faculty of technology, University 20 Aout 1955 - Skikda, ALGERIA

[2] Laboratory LHS, Department of Electronic, Engineering sciences Faculty. University, Constantine 1, ALGERIA

[3] University of Batna2, Technology department, ALGERIA

ABSTRACT

The main objective of this work was to propose a miniaturized annular ring antenna simple and compact. The proposed structure consists of a circular patch shape of with a ring, printed on a small FR4 Epoxy substrate of size 6 × 6 × 0.504 mm3, and fed by a suitable coaxial cable. The obtained results and analysis demonstrate a high stability of the radiated field. A large dual bandwidth at -10dB of 600MHz and 800MHz at resonant frequencies ranging from 35GHz to 57.7GHz. The proposed antenna design exhibits a linear polarization and stable E and H–plane radiation pattern performance at resonance frequencies over the operating bands, with maximum radiation efficiency and peak gain of 95% and 2.25dB respectively. These characteristics make the antenna suitable for future 5G applications and beyond.

Keywords: *Microstrip antenna, annular ring patch, 5G.*

✉ *Corresponding Author Email : l.djouablia@univ-skikda.dz*

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Abs. No: 253

Recycling of lead from spent batteries in the Trepça complex, Mitrovica, Kosovo

Afrim OSMANI, Muharrem ZABELI, Bastri ZEKA
Faculty of Geosciences, University of Mitrovica, 40000, Mitrovica, KOSOVO

ABSTRACT

The paper presents the research for the exploitation of lead from spent batteries as well as the monitoring of the environment in the lead smelter Trepça complex.

As is known, the rate of regeneration of lead from spent batteries is different in different countries in the world, such as in America the rate of regeneration of lead from spent batteries is 88%, while in Europe, such as in: Germany , Italy, France, etc. this rate is around 90%. Well, there are countries that produce lead only from the regeneration of spent batteries as well as other materials from lead, such as: rods, plates, pipes, etc.

The operation of the process is designed for the new refinery, which is in good condition and with a maximum capacity of 20,000 t BS/year.

The paper also presents the environmental monitoring program, which deals with the inspections of the battery recycling factory, the monitoring of the chimney, the monitoring of the quality of the air in the environment, the presentation of recommendations for the necessary improvement measures, identifying the level of cleanliness than the factory and specifying the future objectives.

Keywords: *Regeneration, Spent batteries, Lead, Rotary, Monitoring*

✉ *Corresponding Author Email : bastri.zeka@umib.net*

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Abs. No: 256

Crystallization Kinetics Study of α-Cordierite from MgO–Al2O3–SiO2–TiO2

Ameur OUALI ✉, Smail LAMARA, Foudil SAHNOUNE
Physics and materials chemistry laboratory, Department of Physics, University of M'sila, 28000 M'sila, ALGERIA

ABSTRACT

Using DTA/TG thermal analysis, X-ray diffraction (XRD), and scanning electron microscopy (SEM), crystallization kinetics of -cordierite ceramic from MgO–Al2O3–SiO2–TiO2 glasses obtained through melt cooling are presented. Under 40 cm3/min argon gas flow, DTA experiments were carried out on samples ranging from room temperature to 1400 °C. This study utilized heating rates of 10, 20, 30, 40, and 50 °C/min. The sintered powders' phase transformations were characterized by XRD. Using DTA results, the activation energy values for cordierite formation were measured under both non-isothermal (Kissinger, Boswell, and Ozawa methods) and non-isothermal (Johnson–Mehl–Avrami (JMA) theory) treatments of 845 and 720 kJ mol-1, respectively. When non-isothermal treatments were used, the growth morphology parameters n (the Avrami parameter) were found to be close to 1.5, when isothermal treatments were used (the Ligero method), and Matusita et al. found that m (the numerical factor) was 1.5. The fact that the growth morphology parameters n and m are approximately 1.5 indicates a diffusion-controlled polyhedron-like three-dimensional growth from a constant number of nuclei.

Keywords: *Cordierite, Differential thermal analysis, Avrami parameter, Activation energy*

✉ *Corresponding Author Email : ameur.ouali @univ-msila.dz*

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Kinetics, Phase Transformations and Sintering of Mg-doped LaMnO3

Foudil SAHNOUNE[1] ✉, Amar DJEMLI[1], Abdelmadjid BOUSSENDEL[1], Essebti DHAHRI[2], Nouari SAHEB[3]

[1]physics and materials chemistry laboratory, Department of Physics, University of M'sila, 28000 M'sila, ALGERIA

[2]Laboratoire de Physique Appliquée, Faculté des Sciences, Université de Sfax, B.P.1171, 3000 Sfax, TUNISIA

[3]Dep. of Mechanical Engineering, King Fahd University of Petroleum and Minerals, Dhahran 31261, SAUDI ARABIA

ABSTRACT

Lanthanum manganite (LaMnO3) is a complex oxide compound with various applications in wide fields, including solid oxide fuel cells, magnetic and electronic devices, catalysts, and multiferroics. Several available methods were used by researchers to prepare LaMnO3 such as solid-state synthesis, sol-gel method, hydrothermal synthesis, co-precipitation method, and microwave-assisted synthesis, choosing a method depends on several factors, like desired particle size, morphology, purity, crystal structure of the LaMnO3, and the availability of resources and equipment.

This study investigated the kinetics of LaMnO3 doped with magnesium ceramics synthesized using sol-gel method and starting materials as lanthanum nitrate (La (NO3)3*6H2O), manganese nitrate (Mn(NO3)2*6H2 O), Magnesium nitrate (Mg(NO3)2*6H2O), and citric acid monohydrate (C6H8O7*H2O). In order to characterize the results, various techniques were used, including thermogravimetry (TG), differential thermal analysis (DTA), and X-ray powder diffraction (XRD). The activation energy (Ea) of La0.7Mg0.3MnO3 phase formation was measured by heat treating the sample up to 600 °C in various rates (0.3, 0.5, 0.7, and 1 °C/min) using differential thermal analysis (DTA). Using Kissinger, Boswell, and Ozawa methods ERaR values were calculated and found to be 184, 189, and 185 kJ/mol, respectively.

Both the growth morphology parameter n and the dimension of crystal growth m were determined to be approximately 1.5, suggesting that bulk nucleation with a constant number of nuclei was the dominant mechanism in La0.7Mg0.3MnO3 crystallization, which was followed by one-dimensional growth controlled by interface reaction. The tracking of the phase Transformations done by DTA at different temperatures (260, 400, 700, and 1100 °C) were analyzed using X-ray diffraction. Additionally, we analyzed the material's structural properties at different sintering temperatures (700, 800, 900, 1000, and 1100 °C) for 4 hours. Finally, we examined the changes in the crystal dimension of the material in consideration of both temperature and time.

Keywords: *Phase Transformations, activation energy, Sintering, crystallization kinetics*

✉ *Corresponding Author Email : foudil.sahnoune@univ-msila.dz*

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Abs. No: 263

Monitoring Of Anionic Surfactant Levels In Wastewater

Abdelhak FERRADJ [1,2] ✉, Madjid IDOUHAR [2]

[1] *Higher College of Food Sciences and Food- Agric Industries, Avenue Ahmed Hamidouche, Beaulieu Oued Smar Algiers-ALGERIA*

[2] *Lab. Organic Chemistry Applied, Faculty of chemistry, University of Sciences and Technology Houari Boumediene, USTHB, BP 32 El Alia, Bab Ezzouar, Algiers- ALGERIA.*

ABSTRACT

Industrial and household activities generate various types of pollution that can have significant environmental impacts. These include a wide range of industrial and domestic discharges rich in chemicals, particularly surfactants. Current environmental regulations require a reduction in the residual concentration of surfactants due to the nuisances they can create.

In this context, a spectrophotometric method has been developed for the determination of anionic surfactant compounds. The anionic surfactant forms an ion pair with a cationic dye, which is then extracted into an organic solvent. The developed method has been studied and optimized using different parameters, such as the effect of the buffer on the extraction of the ion pair and the volume of the extraction solvent. The assays conducted in distilled water showed good precision and a detection limit of approximately 6.33 × 10-6 M.

The developed method was applied to the determination of these compounds in the BARAKI wastewater treatment plant. Samples were collected at various points along the Oued El Harrach to monitor the concentrations of anionic surfactants after the treated water was discharged from the treatment plant. The obtained results show a progressive decrease in the concentrations as one moves away from the plant's discharge point.

Keywords: *Anionic surfactants, water pollution, UV-Vis spectrophotometry.*

✉ *Corresponding Author Email : ferradj.abdelhak@gmail.com*

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A Comparative Study for Virtual Personal Assistants (VPA) and State-of-the- Art Speech Recognition Technology

Khalid Mohammad JABER[1] ✉, Mohammed LAFI[2], Ahmad AA ALKHATIB[3], Amani Khamis ABEDALGHAFER[4], Mohammad Abdul JAWAD[5], Amal Qassed AHMAD[5]
[1]AL-Zaytoonah University of Jordan, Department of Computer Science, Amman-JORDAN
[2] AL-Zaytoonah University of Jordan, Department of Software Engineering, Amman-JORDAN
[3] AL-Zaytoonah University of Jordan, Department of Computer Information Systems, Amman-JORDAN
[4]AL-Zaytoonah University of Jordan, Department of Basic Sciences, Amman-JORDAN
[5]AL-Zaytoonah University of Jordan, Department of Electrical Engineering, Amman-JORDAN

ABSTRACT

Numerous types of virtual assistants have emerged as a result of the widespread use of smartphones, the expansion of their services, the tremendous advancements in automatic speech recognition and AI, and the growing reliance on virtual personal assistants (VPAs) for basic daily tasks like playing music, sending texts, making restaurant reservations, and getting weather updates. The popularity of virtual personal assistants is largely attributable to their convenient blend of user-friendliness and natural language interaction. This study comprehensively examines various virtual personal assistants powered by AI. It briefly overviews each, such as Microsoft Cortana, Samsung Bixby, Apple SIRI, Google Assistant, and Amazon Alexa. This study also includes a comprehensive overview of the state-of-the-art speech recognition used in virtual personal assistants. The findings show that each Virtual Personal Assistant has advantages, and a user may select any of them depending on his preferences and needs.

Keywords: *Virtual personal assistants, speech recognition, natural language processing, artificial intelligence*

✉ *Corresponding Author Email : k.jaber@zuj.edu.jo*

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Investigation On Boron Diffusion From Bsg Layers For P+ Emitter Elaboration

Abdelghani BOUCHEHAM[1] ✉, Ahmed Bahaeddine BENSEDIRA[2], Hakim KORICHI[2], Abbes MARREF[1], Chahinez NASRAOUI[1], Boutaleb LABDELLI[1], Lyes BENHERRAT[1], Abdelkader DJELLOUL[1]

[1] Research Center on Semiconductors Technology for Energetics, CRTSE, DDCS, Algiers-ALGERIA
[2] Yahia Fares University/Department of mechanical engineering/LMP2M, Medea, ALGERIA

ABSTRACT

N-type silicon has several advantages over p-type silicon. First, it has a relatively higher resistance to the most common metallic impurities. This allows for higher minority carrier diffusion lengths for Si wafers with similar impurity levels. Second, light-induced degradation (LID) is not present in n-type silicon wafers. This LID is the result of boronoxygen complex formation and is observed for p-type Si wafers. Several concepts of solar cells have been made on n-type silicon, in particular, the PERT structure (Passivated emitter and rear totally diffused).

In this work, BSG (Borosilicate) layers are used for the diffusion of boron in n-type silicon in order to create a p+ junction on the surface and consequently an emitter, our study is focused mainly on the influence of temperature and the duration of the diffusion on the properties of the p+n junction, in particular on its depth and the concentration of boron on the surface. The characterization techniques used are: the four points for the measurements of the sheet resistance, the ECV and the SIMS for the calculation of the concentration of active and total boron, respectively, and for the calculation also of the depth of the junction.

Keywords: *Solar cells, boron diffusion, Boron Silicate Glass, n-type silicon, p-type emitter*

✉ *Corresponding Author Email : a_boucheham@crtse.dz*

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Abs. No: 271

Crystal structure and quantum chemical dft calculations of 2,6-dichloro-4- nitrotoluene

Noudjoud HAMDOUNI[1], Mohamed Larbi MEDJROUBI[1], Ali BOUDJADA[1], Ouarda BRIHI[1], Olivier JEANNIN[2]

[1]Laboratoire de Cristallographie, Université des Frères Mentouri Constantine 1, ALGERIA

[2] Institut des Sciences Chimiques de Rennes, UMR 6226 CNRS-Université de Rennes 1, 35042 Rennes, FRANCE.

ABSTRACT

Our group is interested in understanding the methyl radical behaviour of benzene molecules substituted by halogen and methyl substituents. In the present study, we report the crystal, molecular structure and spectroscopy study of 2,6-dichloro-4-nitrotoluene (DCNT, C7H5Cl2NO2).

The results of SXRD analyzes indicate that this compound crystallizes into a Orthorhombic system with space group P212121and Z = 4. no significant steric hindrance of the methyl group by the ortho halogen atoms is observed. In the crystal, molecules are linked by weak C—H…O and C—H…Cl hydrogen bonds, forming layers parallel to the ab plane. Hirshfeld surface analysis was used to explore the intermolecular contacts in the crystals of DCNT.

At the same time, the results of DFT with the functional MPW1PW91 and the basis Lanl2DZ, led to similar results in the angles and bond lengths compared to the experiment.

The theoretical calculations of spectroscopy allowed the identification of the various modes of vibration of title compound; they will be confronted with the experimental spectra IR and Raman.

Keywords: *Crystal structure, X-ray diffraction, DFT, IR, Raman.*

✉ *Corresponding Author Email : n_hamdouni@yahoo.fr*

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Abs. No: 273

Evaluation of the time function used in concrete creep and shrinkage prediction models.

Dalila BOUCHERIT[1] ✉, Ismail BOUCHERIT[2]

[1] Materials and Environment Laboratory (LME), Civil Engineering Department, Yahia Fares University, Médéa- ALGERIA

[2] Research Laboratory in Advanced Electronics Systems LSEA, Electrical Engineering Department. Yahia Fares University, Médéa-ALGERIA

ABSTRACT

The development of micro-cracks caused by creep and shrinkage is one of the primary factors influencing the durability and service life of concrete structures. These deformations are highly intricate, and their magnitudes are influenced by various parameters. To estimate the long- term creep and shrinkage strains, it is essential to determine the magnitude of these strains over time. However, accomplishing this task requires a function that expresses the rate of evolution of these deformations. The accuracy of predicting creep and shrinkage depends on the form of the time function used. Numerous models are available for engineers to evaluate the behavior of structures, and the most commonly used ones are known for their accuracy. The objective of this paper is to analyze the time functions of four common methods used for predicting creep and shrinkage in concrete, such as CEB-90, B3-2000, ACI-92, and GL-2000. The parameters considered in this analysis are the specimen size and the strength of concrete.

Keywords: *creep, shrinkage, prediction models, time function, specimen size, compressive strength*

✉ *Corresponding Author Email : boudalila2009@gmail.com.*

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Abs. No: 279

Structural investigation of Ag2S nanoparticles fixed on Titanium Oxide

Houda TEBANI ✉, Nassira KEGHOUCHE
Frères Mentouri-Constantine1 University, LMDM Laboratory-physics Department, Constantine-ALGERIA

ABSTRACT

Because of their size dependant electronic and optical properties, silver sulphide semiconductor possesses several applications in photocatalytic [1-2] and medicine field [3]. The present work deals with the structural study of titanium oxide modified by Ag2S semiconductor nanoparticles. The samples are synthesised via a facile chemical reaction, at room temperature. In the beginning, the adsorption of silver ions on TiO2 in wet conditions is optimized, where silver nitrate (AgNO3) is used as silver source. After that, a specific concentration of 2-mercaptoethanol (noted RSH), which plays the role of sulphur atoms source, is added to a solution containing Ag+/TiO2 to obtain finally the studied samples. This later are ready to be characterized by the X ray diffraction (XRD) and Transmission Electron Microscopy (TEM).

X ray diffraction reveals the formation of silver oxide (Ag3O4) phase after impregnation. After RSH addition, XRD pattern present the features of acanthite silver sulphide (Ag2S) [4]. TEM image shows spherical shaped crystallites with uniform distribution of Ag2S (02-20nm) fixed on titanium oxide surface.

Keywords: *Semiconductor, Ag2S, RSH, TiO2*

✉ *Corresponding Author Email : tebani.houda@gmail.com*

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Structural and optical properties of CZTS thin films synthesis by spray pyrolysis : Annealing effect

Meriem MESSAOUDI ✉, Hichem AMAR

Research Center in Industrial Technologies CRTI, P. O. Box 64, Cheraga 16014, Algiers, ALGERIA

ABSTRACT

CZTS thin films have been synthesis by spray pyrolysis method. Aqueous solution containing CuCl2.2H2O as source of Cu, Zn(C2H3O2)2.2H2O as source of Zn, SnCl2.2H2O as tin source and SC(NH2)2 as sulfur source, were used. Effect of annealing temperature on the structural and morphological properties of CZTS films were synthesized by deposited at various different range of annealing temperature from 400, 450 and 500 °C. Flms were analyzed by X-ray diffraction (XRD) and scanning electron microscope (SEM). DRX indicated that deposited films a substrate temperature of 350 °C and annealed at 450 °C have a single phase of CZTS Kesterite structure with a preferential orientation along (112) plane, the crystallinity improved at annealing temperature of 400 °C. With the increase of the annealing temperature to 450 and 500 °C, we show the emergence of several secondary phases Sn2S3, ZnS, CuxS and SnS. It was seen from the SEM photographs that annealing temperature causes remarkable changes in the surface morphology. Good CZTS film with nearly stoichiometric and surface morphology more homogeneous and uniform was obtained at annealing temperature of 400 °C. We concluded that the deposited CZTS films have suitable properties to be used as absorbent layer in thin films solar cells.

Keywords: *CZTS kesterite, annealing temperature, solar cells.*

✉ *Corresponding Author Email : messaoudi_phlmd@yahoo.fr m.messaoudi@crti.dz*

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Abs. No: 281

The Effect of Detuning on the Dynamic Behaviors of External Cavity Quantum Cascade Laser

Abdelouahab HAMADOU1
1 Ferhat Abbas University, Department of optics IOMP, Setif 1 Algeria

ABSTRACT

The effect of frequency detuning on the dynamic behaviors of external cavity quantum cascade laser is theoretically investigated. Our model is based on three- level rate equations including the dependence of the loss on external cavity parameters. We find in particular that the steady state photon number and threshold current of external cavity quantum cascade laser are strongly influenced by the frequency detuning. We also show that the frequency detuning influences significantly the dynamics of the population inversion and photon number in the external cavity. In addition, the frequency detuning dependences of turn-on delay time (tth) is also studied and discussed.

Keywords: *quantum cascade laser, external cavity, detuning*

✉ *Corresponding Author Email : abd_hamado@yahoo.fr*

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Abs. No: 282

System for transfer and converting various natural types of energy

Adalat HASANOV[1] ✉, Backramjan RASAKHODZHAEV[2], Elmaddin ABBASOV[3], Dildar MAMMADOVA[4], Sevinc QASIMOVA[5]

[1] Azerbaijan State Oil and Industry University,Department of Geophysical exploration, Baku-AZERBAIJAN

[2] National Renewable Energy Research Institute under the Ministry of Energy, Tashkent-Uzbekistan,

[3] SOCAR, Mining Geophysics Department, Baku-AZERBAIJAN,

[4] Institute of Geology and Geophysics of the Ministry of science and education, Baku-AZERBAIJAN

5 SOCAR AQSh, Baku-AZERBAIJAN

ABSTRACT

The modern development of the transfer technology of various types of energy is one of the main tasks for the implementing of modern energy-substituting systems. However, the analysis of nowadays experience shows that the scientific and technical problems of creating sufficiently high-tech energy supply systems have not yet been solved. The solution of these problems requires a deep study of the technological processes associated with such energy-substituting systems, the design and testing of effective complexes, etc. The prospects of such complexes are determined by the possibility of their use in remote rural and mountainous areas, where exists natural geothermal energy sources.

This article describes of the technical and economic indicator's assessment for a new type of combined energy supply complexes with a rated power of 5 kW, based on the innovative principles for the conversion of various types of energy and automatic thermal control.

High efficiency used system of energy substitution is achieved by the autonomy of the created energy complex and the rational use of natural energy resources (geothermal and solar energy). Additional energy saving is created through the use of an energy-efficient heat pump, and a heat accumulator with improved thermal insulation characteristics has been created for long-term storage of thermal energy.

Keywords: *energy-substituting and supply systems, natural energy sources, energy transfer technology.*

✉ *Corresponding Author Email : adalathasanov@yahoo.com :*

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Numerical Investigation of Heat and Mass Transfer Process of a Direct Evaporative Cooler

Karima SELLAMI[1] ✉, Nabila LABSI[1], Youb Khaled BENKAHLA[1], Monssif NAJIM[2], M'barek FEDDAOUI[2]

[1] Laboratoire de phénomènes de transfert, RSNE, Faculté de Génie Mécanique et de Génie des Procédés, USTHB, Alger, ALGÉRIE

[2] Laboratoire Génie de l'Energie, Matériaux et Systèmes, ENSA Agadir, MAROCCO

ABSTRACT

This paper deals with the numerical study of the combined heat and mass exchanges in the process of direct evaporative cooler, from a porous media of laminar air flow between two parallel insulated walls. The numerical model implements momentum, energy, and mass conservation equations of humid air and water flow incorporating non-Darcian model in the porous region. The finite volume method is used for the mathematical model resolution, and the velocity–pressure coupling is treated with the SIMPLE algorithm. The main objective of this study is to examine the influences of ambient conditions and the porous medium properties (porosity and porous layer thickness) on the direct evaporative cooling performance from a porous layer. The major results of this study demonstrate that the porous evaporative wall could, in a satisfying manner, reduce the bulk air temperature.

The better cooling performance can be achieved for lower air mass flow at the entrance and relative humidity. Additionally, the evaporative cooler is more effective for a high porosity and a thick porous medium, with an improvement achieving 23% for high porosity.

Keywords: *evaporation, Heat and Mass Transfer, porous medieum, evaporative cooler.*

✉ *Corresponding Author Email : sellami_karima@yahoo.fr*

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Abs. No: 284

Study of heat exchangers fouling in the preheating circuit of crude oil stabilization unit in Hassi Messaoud

Nabila LABSI ✉, Khaoula BRAKBI, Asma AZIBI, Youb Khaled BENKAHLA
Laboratory of Transport Phenomena (Team: RSNE), Faculty of Mechanical and Process Engineering, University of Science and Technology Houari Boumediene USTHB, Algiers-ALGERIA

ABSTRACT

Shell and tube heat exchangers are widely used in oil industry. The fluids transported inside and outside the tubes are not necessarily clean and can lead to the deposit of undesirable solid particles on the heat exchange surfaces. The control of this economic problem is done by checking the evolution of the fouling resistance over time, in order to choose the right moment of cleaning to avoid the high costs linked to maintenance and to energy losses.

The present experimental study deals with this subject; it's about following the fouling resistance over time of the EA01 heat exchangers battery of the crude oil stabilization unit located in Hassi-Messaoud in Algeria, using the Kern method.

The results show the visible presence of a deposit, given the very high values of the fouling resistance, probably due to a poor cleaning, the age of the installation and primarily, to the malfunction of the desalter. Indeed, the latter diffuses the desalted crude oil entering the battery of exchangers in question, in a state that does not meet cleanliness standards. In addition, the fouling resistance evolves exponentially over time, with the presence of fluctuations caused by the instability of inlet temperature and fluid flow rate. The absence of an induction time is observed since the study took place a year after the last cleaning of the exchangers.

Moreover, the pressure drop inside the heat exchangers is greater inside the tubes than outside, which would mean that the fouling is much more important inside the tubes.

Keywords: *Fouling, Fouling resistance, Deposit, shell and tube heat exchanger, Kern method.*

✉ *Corresponding Author Email : nabilalabsi@yahoo.fr*

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Abs. No: 285

Hydrodynamic behaviour of the flow of a non-Newotonian nanofluid: Silver/Carreau-Yasuda

Nabila LABSI ✉, Nihal TOUDJA, Nesrine ALLALOU, Youb Khaled BENKAHLA
Laboratory of Transport Phenomena (Team: RSNE), Faculty of Mechanical and Process Engineering, University of Science and Technology Houari Boumediene USTHB, Algiers-ALGERIA

ABSTRACT

The present numerical study concerns the laminar and steady forced convection flow of a non Newtonian nanofluid within a pipe. The nanofluid consists in a suspension of silver nanoparticles within Polyethylene melt that obeys the rheological model of Carreau-Yasuda, of constant physical and rheological properties.

The governing equations are solved using the finite volume method in order to analyse the effect of the addition of nanoparticles on hydrodynamic behaviour of the flow.

The results show that the addition of nanoparticles and the increase in their volume fraction lead to the decrease of the central velocity. This has a negative effect on the pressure drop within the pipe since the friction factor of Fanning is intensified by the increase of nanoparticles volume fraction.

In addition, The increase in the flow index of the non-Newtonian nanofluid and the decrease of the Weissenberg number cause an increase in the central velocity as well as in the Fanning friction factor.

Keywords: *Carreau-Yasuda fluid, Silver nanoparticles, Finite volume method, Friction factor.*

✉ *Corresponding Author Email : nabilalabsi@yahoo.fr*

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Crystal structure, Hirshfeld surface analyses, spectroscopic characterization, DFT calculations of Tribromoalinine

Ouarda BRIHIA , Meriem MEDJANIA, Souheila CHETIOUIB, Sabah KELLOUA, Noudjoud HAMDOUNIA, Ali BOUDJADAA

1 Crystallography Laboratory, Mentouri University, Constantine, Algeria
2 Research Unit for Environmental Chemistry and Molecular Structure.

ABSTRACT

Tribromoalinine was characterized by X-ray diffraction and vibrational spectroscopy. The title compound C6H4Br3N crystallizes in space group P 21 21 21..The analyse of the Hirshfeld surface and plotted fingerprint plots of Tribromoalinine was obtained using the Crystal Explorer 3.1 package [1]. The crystal structure was imported from CIF files. The red spots on the Hirshfeld surface indicate the interactions involved in hydrogen bonds. 2D fingerprint plots were prepared with the use of the same software.The electrostatic potential surface (ESP) was obtained using the Gaussian program package [2]. In ESP, the negative electrostatic potential appears in the red region , and positive electrostatic potential appears in blue.

The optimized molecular geometry and vibrational frequencies in the ground state are calculated using density functional MPW1PW91 method with Lanl2DZ basis set combinations, with the Gaussian09 suite program [3] . And also HOMO–LUMO energy gap explains the eventual charge transfer interaction taking place with in the molecules.

Keywords: *Diffraction, Hirshfeld Surface, DFT (Density Functional Theory), Conformation.*

✉ *Corresponding Author Email : E-mail: brihiouarda@gmail.com*

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Radiation shielding properties of synthesized Boro-tellurite glasses influenced by heavy metal

M.I. SAYYED[1] ✉, Kawa M. KAKY[2]

[1]Department of Physics, Faculty of Science, Isra University, Amman – JORDAN

[2]Nanotechnology and Advanced Materials Research Center, University of Technology, 35010, Baghdad, IRAQ

ABSTRACT

The present study involved the synthesis of a series of Boro-tellurite glasses, with a composition of (60-x)B2O3-10TeO2-20Li2O-10Al2O3-xMoO3, where x was varied at 0, 5, and 10 mol%. The glasses were obtained using the conventional process of melt-quenching-annealing, where the melting temperature was set at 1000 °C and the annealing temperature was maintained at 300 °C for a duration of five hours. The structural characteristics of the samples were examined through X-ray diffraction analysis within the 10° to 80° range, in order to establish the amorphous state of the glasses. Additionally, the utilization of Attenuated Total Reflectance Fourier Transform Infrared (ATR-FTIR) was implemented to investigate the functional groups present in B, Ge, and other elements. In order to investigate the optical characteristics of transparency and cut-off wavelength, as well as indirect, direct, and Urbach energy band gaps, optical absorption measurements were conducted within the 200-800 nm range. The radiation shielding properties for the prepared glasses were simulated using Monte Carlo simulation and the results showed that the addition of MoO3 causes an increase in the linear attenuation coefficient.

Keywords: *Boro-tellurite glasses; Radiation shielding properties; ATR-FTIR; MoO3*

✉ *Corresponding Author Email : dr.mabualssayed@gmail.com*

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Abs. No: 294

Atmospheric water collection using PVC-PVP nanofibers with Thermo-Electric Cooling devices as atmospheric water generator

Majdi AL-MAHASNEH ✉, Mohannad ALJARRAH, Dhoha Ali ABU-ALHIJA

Chemical Engineering Department, Jordan University of Science and Technology, P.O.Box 3030, Irbid 22110, JORDAN

ABSTRACT

Water scarcity is a worldwide problem. The need for freshwater is increasing as a result of many factors such as population growth, industrial development and climate change. Water treatment methods such as desalination process produce a good amount of water. However, it is costly, require large space and high amounts of energy especially in remote areas. So, alternative water resources, such as air water harvesting must be considered as a possible water source especially for hot and humid regions. In this paper, a prototype of air water generator was designed, built, and tested. The operation of the prototype is based on harvesting water from air using Peltier effect also known as thermoelectric cooling device (TEC). The system was conducted under different conditions: ambient temperature (28 &29) °C, relative humidity (47, 59, 68, 75, 85, and 95) %. Two collecting surfaces were used, aluminium foil, and electrospun polyvinyl chloride (PVC) combined with polyvinylpyrrolidone (PVP) nanofiber. Based on the results obtained, it was found that using PVC-PVP nanofiber increased the amount of harvested water. At temperature 29°C and RH 95%, the prototype produced an average water of 104.94 mg/cm2 .h using nanofiber, and only 89.44mg/cm2 .h using aluminium foil surface. The nanofiber is hydrophobic, with water contact angle of 130.25°. The harvested water was tested for water quality. It is observed that most results comply with Jordanian Drinking Water Standards and World Health Organization. The chemical structures of the nanofibers was characterized by Fourier transform infrared (FTIR), Scanning electron microscopy (SEM) and water contact angle measurement method to determine the morphology and surface hydrophobicity of the nanofiber.

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Abs. No: 296

Mechanism and characterization of Forsterite (Mg2SiO4) formation obtained by the sol-gel method

Menad HERAIZ ✉, Ahcen KEZIZ, Khadidja CHOUDER
Physics and Chemistry of Materials Laboratory University of M'sila, ALGERIA

ABSTRACT

In this work, forsterite precursor powder was prepared through a technology of low-temperature synthesis by using the sol-gel process, tetraethyl orthosilicate, and Mg(NO3)2.6H2O were used as raw materials to synthesize forsterite. To pursue and characterize the crystalline phases and their transformation as a function of temperature, Thermogravimetry, differential thermal analysis, X-ray diffraction and Fourier-transform infrared spectroscopy was used.

The results showed that the crystallization process occurred in the temperature range of 650 to 1100 °C. Forsterite, a mineral with the chemical formula Mg2SiO4, was formed in the 650– 800 °C temperature range. When the temperature is increased from 800 °C to 1100 °C, forsterite becomes more crystallized. The obtained results agree with the X-ray diffraction analyses that approve that there is just one phase (forsterite).

The activation energy values (Ea/Tm) calculated by Ozawa, Boswell, and Kissinger methods are in good agreement with the activation energy (Eα/Tα) calculated using the KAS and FWO methods. So as to determine the interaction model and find the parameters that determine the interaction model based on the experimental data, Malék's methodology method was used. The Šesták - Berggren model is the most appropriate kinetic model to describe the reaction process to form forsterite. From the SB model, the equations Kinetics and all kinetic parameters (n, m, ln(k0)) that describe the kinetics of the reactions and mechanisms of formation of forsterite are, respectively, 1.02 , 0.36, and 26.8. While the values of Gibbs free energy #ΔG, enthalpy #ΔH, and entropy #ΔS were as follows: 294.871 kJ/mol, 252.938 kJ/mol, and -40.5 J/mol.K for forsterite formation.

Keywords: *Forsterite, X-ray diffraction, differential thermal analysis (DTA) ,sol gel ,kinetics, Šesták − Berggre model, Malék's methodology*

✉ *Corresponding Author Email : menad.heraiz@univ-msila.dz; ahcen.keziz@univ-msila.dz;chouderkhadidja28@gmail.com*

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Microstructure and Mechanical Properties of In-situ High-Temperature Titanium Matrix Composites

Yuyong CHEN ✉, Jingxi WU, Ping SUN

[1] *School of Materials Science and Engineering, Harbin Institute of Technology, Harbin 150001, CHINA*

[2] *State Key Laboratory of Advanced Welding and Joining, Harbin Institute of Technology, Harbin 150001, CHINA*

ABSTRACT

Titanium matrix composites (TMCs) have attracted significant interest for their prospective applications in the aerospace, automotive, chemical, marine engineering, and biomedicine fields due to their light weight, excellent specific strength, superior high-temperature strength, and good corrosion resistance. With the rapid development of the aerospace field, particularly the hypersonic vehicle, the service environment of key components such as the firewall and skeleton has become increasingly harsh in recent years, increasing the demand for high-performance titanium matrix composites. In the area of precision thermoforming of high-temperature titanium matrix composites, the team has conducted extensive research and obtained a series of outstanding results. The reaction mechanism between the high-temperature TMCs melt and ceramic shell was revealed, a highly stable oxide ceramic shell suitable for high-temperature TMCs was developed, and asymmetric complex- structural TMCs components were produced. The formation mechanism of defects in high- temperature TMCs ingots was elucidated, and an effective control method was proposed. The addition and dispersion technology of nanoparticles in TMCs were proposed to significantly refine the grain size, resulting in superior mechanical properties to better serve at 700 °C. The interface structures and strengthening mechanism of in-situ reinforced TMCs were clarified. A mature thermomechanical processing system for TMCs was established, including multi-directional forging, extrusion, traditional hot rolling, and pack ply-rolling, and developed the largest size TMCs sheets reported so far (2060 × 680 × 2.0 mm). This paper outlines the team's research progress in the preparation process, microstructure, and typical service performance of TMCs, as well as the future research focus and development direction of TMCs and their preparation technology.

✉ *Corresponding Author Email : yychen@hit.edu.cn*

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Abs. No: 298

Study of the substrate effect on the magnetic properties of the Fe(001) monolayer in the Fe(001)/Rh system

Abdelmadjid BOUSSENDEL ✉, Menad HERAIZ
Laboratory of physics and chemistry of materials, university of m'sila, Department of Physics, 28000 M'sila ALGERIA

ABSTRACT

We have study in this work the substrate effect of the Rhodium (Rh) on the magnetic properties of the Fe(001) monolayer in the Fe(001)/Rh system by the generalized gradient approximation (GGA), within the Full potential linearized augmented plane waves method (FPLAPW) based on density functional theory (DFT). The calculations showed that the values of the spin and orbital magnetic moments are proportional to the lattice parameter a, and the values of the orbital magnetic moment are very small compared to those of the spin magnetic moment, which implies that the magnetism becomes from the spin in the transition metals, moreover we also note that there is a large increase in the value of the magnetic moment of the monolayer Fe(001) compared to the value of the bulk. From the figures of the density of state, we showed that the magnetism is due to the d layer and that the contribution of the s, p and f layers to the total magnetic moment is negligible. Also, the calculations showed that the magnetic moments are not related to the number of k points in the Irreducible Brillouin zone.

Keywords: *DFT, FLAPW, Magnetic Properties, spin magnetic moment, orbital magnetic moment*

✉ *Corresponding Author Email : aboussendel@yahoo.fr*

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Abs. No: 301

Utilizing a Forced Van der Pol-Rayleigh-Helmholtz Oscillator under Heptamodal-frequency Operations in Casimir Force Measurement

Cagri YILMAZ✉

Akdeniz University, Department of Electronic and Automation, Vocational School of Technical Sciences, Antalya-TÜRKİYE

ABSTRACT

In this paper, casimir force sensitivity is investigated by utilizing a micro-cantilever under the driving forces in heptamodal operations. A novel forced Van der Pol-Rayleigh-Helmholtz nonlinear oscillator model is developed to describe the nonlinear dynamics of the micro-cantilever which is subject to the excitation and casimir forces simultaneously. Demonstrating the effectiveness of the heptamodal operations, single- and tetramodal-frequency excitation schemes are also applied separately to resonate the micro-cantilever at the fundamental and higher eigenmodes. The oscillation observables of the externally driven micro-cantilever are determined in the presence of the casimir forces in the separation distance range of 200-800 nm. Remarkable variations in amplitude ratio, phase shift, and frequency shift for different effective masses of the micro-cantilever are explored for the higher eigenmodes. In this current work, the maximum phase shift response of around 150 degrees at the sixth eigenmode is achieved using heptamodal-frequency excitation of the lightest micro-cantilever at the separation distance of 200 nm. Thus, implementing heptamodal-frequency excitation schemes has considerable potential to improve the phase shift sensitivity to casimir forces when compared with other excitation schemes. Additionally, the parameters of the nonlinear oscillator determine significantly the patterns of the time-domain sensitivities to the external forces. Correspondingly, displacements of the micro-cantilever under the driving and casimir forces at different eigenmodes are obtained to investigate diverse system nonlinearities. Furthermore, the virial and dissipated power are also determined for different effective masses of the micro-cantilever to explain the energy dissipation process in the measurement of casimir forces. Therefore, in the present work, the observable responses and energy quantities for particular system nonlinearities are introduced to be utilized for nanometrological applications.

Keywords: *Micro-cantilever, Van der Pol-Rayleigh-Helmholtz oscillator, Casimir force sensitivity, Heptamodal-frequency excitation, Energy dissipation*

✉ *Corresponding Author Email : cagriyilmaz@akdeniz.edu.tr*

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Lanthanum Manganite LaMnO3 Crystallization Kinetics Prepared Through Sol- Gel Auto-Combustion Method

Boussendel ABDELMADJID ✉, Amar DJEMLI, Foudil SAHNOUNE
Department of Physics, University Mohamed Boudiaf of M'sila, 28000, M'sila, Algeria

ABSTRACT

This study focused on the synthesizing, phase transformation, and sintering behavior of Lanthanum manganite (LaMnO3), and the importance of such material due to its imbedded potential applications in various fields, including catalysis, energy storage, and solid oxide fuel cells. The sol-gel auto-combustion method was used in the preparation of the LaMnO3 sample, Sol-Gel method is known to it superior qualities such as high purity, homogeneous materials, and the ability to control particle size and morphology. The investigation of LaMnO3 sample phase transformation and sintering behavior was done in this study using several analytical techniques, thermogravimetry (TG), differential thermal analysis (DTA), and X-ray diffraction (DRX) analysis. In order to describe the energy barrier required for a particular process to occur such as a phase transformation or a chemical reaction, the activation energy (EA) for the phase transformation was calculated using three different methods: The Kissinger, Boswell, and Ozawa method. EA value was determined to be 173.8, 184, and 170 kJ/mol, respectively. which provides important information about the energy requirements for the phase transformation to occur for LaMnO3 materials, this information is extremely useful in the conditions of the process throughout designing and optimizing. The parameters that describe the reaction mechanism and the rate of the process are called kinetic parameters of Avrami n and m, which were calculated and found to be approximately 1.5. Overall, this study is essential because it provides insightful scope into the phase transformation and sintering behavior of LaMnO3.

Keywords:

✉ *Corresponding Author Email : zaamdj@gmail.com; abdelmadjid-boussendel@univ-msila.dz; foudil.sahnoune@univ-msila.dz*

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Determination of Radiation Absorption Properties of Some Concretes Containing Heavy Aggregate and Ulexite

Ezgi Yıldız ATEŞ[1] ✉, Hüseyin Ali YALIM[1], Mücteba UYSAL[2]
[1]Afyon Kocatepe University, Physics Department, Afyonkarahisar-TÜRKİYE
[2] Yıldız Technical University, Civil Engineering Department, İstanbul-TÜRKİYE

ABSTRACT

In daily life, we are exposed to radiation of different types and energies. Depending on the type and energy of the radiation exposed, there is a possibility that radiation poses a risk to the health of living things. One of the ways to protect people from the harmful effects of radiation is to keep the radiation dose as low as possible. For this purpose, there are different measures that can be taken. These measures are widely known as time, distance and shielding. Shielding is a legal requirement when there is an obligation to be in radiation areas where time and distance cannot produce the required solution.

Gamma ray, which has the shortest wavelength and the highest energy in the electromagnetic spectrum, can easily pass through the material medium as it is uncharged and massless, and this makes it necessary to make appropriate shielding. It is necessary to know the gamma absorption coefficients for the different energy values of the materials to be used in the shielding process.

In this study, it was aimed to develop radiation shielding material by using siderite and ulexite at different rates for protecting the staff directly exposed to ionizing radiation while working in X-ray service, operating rooms and similar units. For this purpose, 6 types of samples containing siderite and ulexite at different rates were produced in accordance with TSE 800 standards. Electromagnetic radiation absorption coefficients of the concrete samples were determined.

Keywords: *Radiation absorption coefficient, Gama-ray radiation, Heavy aggregate, Siderite, Ulexite*

✉ *Corresponding Author Email : ezgiates@okyanuskoleji.k12.tr*

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Abs. No: 307

Conceptual Design Study Of Modular Very Small GCFR

Zaki SU'UD[1,2] ✉, Feriska H. IRKA[1,2,3], J. Pierre NDAYIRAGIJE[1,2], Nur Asiah APRIANTI[1,2], R.D. SYARIFAH[4] , ZUHAIR[5]

[1]*Dept of Nuclear Science and Technology, Faculty of mathematics and Natural Sciences, Bandung institute of Technology (ITB), Bandung-INDONESIA*

[2]*Nuclear and Biophysics Research Division, Faculty of mathematics and Natural Sciences, Bandung institute of Technology (ITB), Bandung-INDONESIA*

[3] *Dept of Physics, Andalas University, Padang-INDONESIA*

[4] *Dept of Physics, Universitas Jember, Jember-INDONESIA*

[5] *Nuclear Division, Indonesian Research Institute (BRIN), Jakarta-INDONESIA*

ABSTRACT

Conceptual design study of very small Modular Helium Gas Cooled Fast Reactors have been performed. The investigated reactor cores consist of three regions in radial direction while in axial direction only one region. The reator powers varies from 5 MWt to 70 MWt and plutonium from LWR used fuel are employed in the fuel. Plutonium content in each region, the region width, and fuel volume fraction are adjusted to minimize excess reactivity during 25 years long life operation without shuffling and refueling. Np-237 isotop is also added to further reduce excess reactivity during burnup. Pb is used as reflector in radial and axial direction. The simulations have been conducted using SRAC code system and FI-ITBCH1 code. Nitride fuels are used to give compact core and high internal conversion ratio. As an example of the optimized results, for the 35 MWt core, it is obtained 25 cm total radial width and 47.5cm axial width of the active core, 30 cm reflector width in axial and radial direction, the Plutonium fraction is varied from 11.25% to 13.25% of total heavy metal. Np-237 content is varied from 2% to 5%. The optimized result for this core shows that the maximum excess reactivity can be minimized below 1% dk/k.

Keywords: *Very small reactor, Gas cooled, Fast reactors, Long lfie operation, Excess reactivity, Neptunium 237,*

✉ *Corresponding Author Email : szaki@itb.ac.id, zakisuud@gmail.com*

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Abs. No: 309

Unexpected effect of aging on the dielectric properties of PE used in cable coating expired and irradiated by γ-Co60 up to 50 KGy

Nabila BOUTOUCHENT-GUERFI [1] ✉, Sonia RETİEB[2], Karim HIRECHE[2], Nesrinne SEDDIKI[3]

[1]Centre de Recherche en Technologie des Semi-conducteurs pour l'Energétique (CRTSE), 2 Bd Frantz Fanon BP 140 Alger-7-merveilles, BP 16038, Algiers, ALGERIA

[2]Université Mouloud Mammeri, Faculté de génie électrique et d'informatique, Département d'électrotechnique, route principale Hassnaoua, BP 17, Tizi Ouzou, ALGERIA

[3]Université M'hamed Bougara, Avenue de l'indépendance, 35000, Boumerdès, Algériers, ALGERIA

ABSTRACT

The aim of this work is to study gamma radiation effect on the Polyethylene compound (PE) produced in: 2015 and 2017, before being crosslinked, widely used for manufacturing high and medium voltage cables. Within this work, the physical and chemical properties of the PE/2015 and PE/2017 have been studied, to explain the dielectric properties behavior of our insulator under the bombardment effect up to 50 KGy. Several experimental tests, using essential characterization techniques has been carried out, such as evolution of the dielectric loss factor, the relative permittivity and the transverse resistance. Including physical and mechanical properties. The relevant results showed that the gamma rays at 25 KGy has a great effect on the PE/2015 compound expired under the effect of storage conditions. However, PE/2015 recovered, its properties lost during storage through energy absorbed by gamma rays. Through these promising results, PE/2015 expired will not be thrown away, it will be recovered for the same application in order to preserve the environment.

Keywords: *polyethylene, cable coating, storage, radiation, dielectrical properties.*

✉ *Corresponding Author Email : guerfinabila@yahoo.fr/nabila.boutouchent@gmail.com*

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Determining the Corrosion Speed of Welded AA 5005 Alloy with AA5356 Filler Metals According to Weld Rate Using by MIG Welding Technique

Hüseyin MÜŞTAK, Günhan BAYRAK

ABSTRACT

Corrosion is one of the most damaging and costly naturally occurring events seen today. There are several methods for predicting the corrosion rate. In the present study, AA 5005 cold rolled plate was used for welding application with AA5356 filler materials using the MIG welding process. 750 mm/min and 930 mm/min weld rates were applied for the weld joint of the cold-rolled AA 5005 plate. The Tafel extrapolation method was used for the investigations of the weld joint, heat-affected zone, and base metal. Analyses are done in DC Corrosion Software and corrosion products have been observed at SEM. Beside Tafel test, Salt spray test had been applied to samples and checked visually. At higher speed, the result shows that corrosion resistance is better than at slower speeds.

Keywords: *Corrosion, Speed, AA 5005, AA536, MIG, Tafel, Extrapolation.*

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Abs. No: 311

Investigation of the influence of atmospheric pressure plasma surface treatment on adhesively bonded glass fiber reinforced epoxy composite joints

Asil AYAZ[1] ✉, Gizem Dilara ÖZDEMİR[2], Utku Kürşat ERCAN[2], Kutlay SEVER[1]
[1]İzmir Katip Çelebi University, Mechanical Engineering Department, İzmir-TURKEY
[2] İzmir Katip Çelebi University, Biomedical Engineering Department, İzmir-TURKEY,

ABSTRACT

The surface properties of glass fiber reinforced epoxy composites have a significant influence on the mechanical properties of adhesively bonded single lap joints. In this study, it is aimed to investigate the effect of plasma surface treatment on the strength of adhesive joints. Surface modifications of GFRP specimens were studied using different exposure times and powers of atmospheric plasma system. After the plasma surface treatment applied to the specimens, it was determined that the reason for the decrease in the water contact angle was the increase in the oxygen content on the surface as a result of the XPS analysis. Single lap shear joint tests were conducted to evaluate the mechanical performance of the dissimilar joints. In addition, atmospheric pressure plasma treatment significantly influenced the surface characteristics, surface contact angle, and surface free energy of the specimens, and then affected the single lap joint strength. Compared with the untreated, sanding and peel ply surface treatments, it was observed that the atmospheric plasma surface treatment provided the highest single lap adhesive joint strength. After the shear tests, the fracture surfaces of the joints were examined and it was observed that the samples with the highest bond strength had the cohesive fracture mode.

Keywords: *polymer composite, surface treatment, adhesive single lap joint, atmospheric plasma*

✉ *Corresponding Author Email : asilayaz93@gmail.com*

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Effect of atmospheric pressure plasma treatment on adhesively bonded single lap joints of glass fiber reinforced epoxy composite and aluminium alloy

Asil AYAZ[1] ✉, Gizem Dilara ÖZDEMİR[2], Utku Kürşat ERCAN[2], Kutlay SEVER[1]
[1]İzmir Katip Çelebi University, Mechanical Engineering Department, İzmir-TURKEY
[2] İzmir Katip Çelebi University, Biomedical Engineering Department, İzmir-TURKEY,

ABSTRACT

Currently, adhesive bonding has become one of the most extensively employed techniques for joining in a range of applications in industry, including automotive, aerospace, and marine construction. In this study, sanding, peel ply and atmospheric plasma surface treatments have been performed to change the surface properties and increase surface adhesion between glass fiber reinforced epoxy composite and Aluminium 5083 alloy. An important and common structural epoxy adhesive used in industries such as aerospace, automobile and marine has been applied for single lap joining of dissimilar specimens. Contact angle measurements were carried out to obtain information about the changes in the surface of the specimens. Then, single lap shear tests were performed to determine the average shear strength of the adhesively bonded single lap joints. The effects of sanding, peel ply and dbd atmospheric air plasma surface treatments on single lap joint strength of treated samples compared to that of untreated samples were investigated. After the shear tests, the fracture surfaces were observed and the failure modes were determined. It has been determined that the plasma surface treatment provides the highest shear strength in the GFRP - Aluminum adhesively bonded joints.

Keywords: *polymer composite, surface treatment, adhesive single lap joint, atmospheric plasma*

✉ *Corresponding Author Email : asilayaz93@gmail.com*

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A non-newtonıan behavıor effect on of Hybrid journal bearıngs performances

Sid Ali BOUBENDIR[1] ✉, Maamer MALKI[2], Salah LARBI[3], Salim TRIAA[1], Lynda BOUBENDIR[1]

[1] *University of Sciences and Technology H-Boumediene , Mechanical engineering Department, Algiers- ALGERİA*

[2] *National High School of Technology, Department of Mechanical Engineering, Bordj El Kiffan, ALGERİA*

[3] *Polytechnic National School of Algiers, LGMD,, Algiers, ALGERİA,*

ABSTRACT

A numerical study of hydrodynamic lubrication of a hybrid journal bearing using the couple stress lubricant has presented. It is well known that the addition of additives to fluids improves its performance and their rheological behavior becomes non-Newtonian. The hybrid bearings characteristics are based on mixed modes of lubrication. They offer the possibility of improving both the zero speed characteristics of hydrostatic bearings and the high speed characteristics of hydrodynamic bearings.

The lubricant motion governing equations have been modified and adapted to couple stress fluids case. The equation obtained was solved numerically using the finite difference method taking into account the geometric of the hybrid journal bearings and the corresponding boundary conditions. The results obtained show an improvement in the performance of hybrid journal bearings operating with couple stress fluids compared to Newtonian fluids case. The parametric study has shown that the presence of additives in the lubricant can change the lubrication regime, particularly in the case of heavily loaded bearings rotating at high speeds. For the hydrostatic bearings case, the effect of couple stress fluid is negligible.

Keywords: *Hybrid Lubrication, Non-Newtonian fluid, Couple stress fluid*

✉ *Corresponding Author Email : boub_usthb@yahoo.fr*

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Abs. No: 319

The Superiority of Generalized Poisson Mixed Regression Model in Modeling Global Lung Cancer Prevelance in the Aspect of Environmental Health, Climate Change, and Ecosystem Vitality to Achieve Sustainable Development Goals by 2030

Neslihan İYİT ✉
Selcuk University, Science Faculty, Statistics Department, Konya-TÜRKİYE

ABSTRACT

In this study, the global effects of PM2.5, NOx, and CO exposures as the air quality indicators, unsafe sanitation and drinking water indicators, controlled solid waste as the waste management indicator in the environmental health effect; climate change mitigation in the climate change effect; agriculture and wastewater treatment indicators in the the ecosystem vitality effect, and also competitive industrial performance (CIP) index are investigated on the prevalence of the lung cancer by negative binomial (NB-1 and NB-2) regression models, Conway-Maxwell Poisson (COM-Poisson) regression model, generalized Poisson regression model, NB-1 and NB-2 mixed regression models, COM-Poisson mixed regression model, and generalized Poisson mixed regression model.

Keywords: *Environmental health, Climate change, Ecosystem Vitality, Negative binomial (mixed) regression model, Conway-Maxwell Poisson (mixed) regression model, Generalized Poisson (mixed) regression model.*

✉ *Corresponding Author Email : niyit@selcuk.edu.tr*

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Abs. No: 322

Electronic structure and ferromagnetism in MnAs crystal

Ahmed GUEDDIM[1], Fadila MEZRAG[2] , Nadir BOUARISSA[2] ✉

[1]Materials Science and Informatics Laboratory, Faculty of Science, University of Djelfa, 17000, Djelfa, ALGERIA

[2]Laboratory of Materials Physics and Its Applications, University of M'sila, 28000 M'sila, ALGERIA

ABSTRACT

The present study deals with first-principles all electrons density-functional calculations for the electronic and magnetic properties of the material MnAs, in the hexagonal NiAs-type phase. The calculations are spin-polarized. Our results show that the material of interest is a ferromagnetic metal and reaches a total magnetization of the order of 5.69 μB per cell.

Keywords: *Band structure; Ferromagnetism; Magnetization; MnAs; NiAs-structure; Spintronics.*

✉ *Corresponding Author Email : N_Bouarissa@yahoo.fr & nadir.bouarissa@univ-msila.dz*

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Abs. No: 323

Pseudo-potential calculations on electronic and optical properties of gallium phosphide under pressure

Nadir BOUARISSA[1,2] ✉, Fadila MEZRAG[1,2], Nour-El-Houda FARES[3], Fahima FARES[4]

[1]*Laboratory of Materials Physics and Its Applications, University of M'sila, 28000 M'sila, Algeria*

[2]*Physics Department, Faculty of Science, University of M'sila, 28000 M'sila, Algeria*

[3]*Materials and Electronic Systems Laboratory, University of Bordj-Bou-Arréridj, 34000, Bordj-Bou-Arréridj, Algeria*

[4]*Electronics Department, Faculty of Science, University of Bordj-Bou-Arréridj, 34000, Bordj-Bou-Arréridj, Algeria*

ABSTRACT

We report an elaborated learning of gallium phosphide electronic band structure and optical properties at zero and under elevated hydrostatic pressure utilizing a pseudo-potential oncoming. Characteristics like direct and indirect transitions, valence band breadth , refractive index and high- frequency dielectric constant have been calculated and their dependence on pressure has been considered and disputed. An elaborated comparison has been fabricated between our performances and beforetime signaled input in the literature. The attainments acquired in the offered investigation may supply useful information for employment of the material in under study in different optoelectronic applications.

Keywords: *Electronic structure; Optical characteristics; GaP; Pressure effect.*

✉ *Corresponding Author Email : N_Bouarissa@yahoo.fr & nadir.bouarissa@univ-msila.dz*

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Abs. No: 324

Controlling Electron Density in 3D Printed PLA Objects: Impact of Key Independent Parameters

Kaltrine JAKUPI [1] ✉, Sehad KADIRI[2,3], Vladimir DUKOVSKI[4], Fesal SELIMI[3], Burim UKA[3], Labinot KASTRATI[3], Gezim HODOLLI[3,5],

[1] Faculty of Mechanical Engineering, University of Prishtina "Hasan Prishtina", 10000 Pristina, Republic of KOSOVO.

[2] Faculty of Radiology, AAB College, 10 000 Pristina, KOSOVO

[3] University Clincal Ceneter of Kosova, Clinic of Oncology, 10000 Pristina, Republic of KSOVO.

[4] Faculty of Mechanical Engineering, "Ss. Cyril and Methodius" University in Skopje, 1001 Skopje, Republic of North MACEDONIA.

[5] Faculty of Veterinary and Agriculture, University of Prishtina "Hasan Prishtina", 10000 Pristina, Republic of KOSOVO.

ABSTRACT

Additive manufacturing, or 3D printing, has transformed manufacturing by offering precision and customization. In medicine, 3D printing creates tailored medical devices. Radiotherapy uses boluses to modify radiation dose distribution, and 3D-printed boluses offer advantages. Electron density (ED) in these boluses is vital for treatment accuracy, affecting attenuation coefficients. Hounsfield Units (HU) from CT scans help correlate ED. PLA is a favored material for boluses due to its properties.

This study investigates 3D-printed PLA boluses, focusing on infill percentage, print speed, and layer height's influence on HU values. Using the Taguchi method, optimization was performed, and CT simulations were conducted. The results show that manipulating these parameters affects electron density, which is critical for radiotherapy accuracy.

In summary, this research emphasizes the importance of optimizing printing parameters to achieve the desired electron density in 3D-printed PLA boluses for radiotherapy.

Keywords: *PLA; Electron Density; Radiotherapy; Optimizing*

✉ *Corresponding Author Email : kaltrine.jakupi@uni-pr.edu :*

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Abs. No: 326

Enhancing Financial Time Series Forecasting with a Temporal Ensemble Machine Learning Framework

J.Francisco MUÑOZ-ELGUEZABAL ✉, J.Diego SÁNCHEZ-TORRES, Riemann RUIZ-CRUZ
Western Institute of Technology and Higher Education, Mathematics and Physics Department, Tlaquepaque, MEXICO

ABSTRACT

Financial time series (FTS) analysis is pivotal in understanding market dynamics. However, the temporal structure inherent in FTS data poses significant challenges for any modeling endeavor. Our work introduces a novel approach to address these challenges by leveraging ensemble methods tailored to the temporal nature of financial data.

The conventional use of cross-validation (CV) in FTS analysis relies on the assumption of independent and identically distributed (i.i.d) samples, a simplification that may not hold in reality. Our study begins by highlighting the limitations of such assumptions in FTS analysis, acknowledging the presence of non-deterministic relationships between features and target variables across different samples.

To overcome these limitations, we propose a Temporal Ensemble Learning framework that adapts ensemble methods to the temporal context of FTS data. This approach incorporates diverse modeling techniques and considers time-dependent patterns, ensuring that the ensemble captures various temporal aspects. Furthermore, it dynamically adjusts the weights assigned to individual models based on historical performance and their ability to capture temporal patterns effectively, enhancing adaptability to changing market conditions.

Incorporating ensemble methods into FTS analysis also involves diversifying the learning process through a combination of Temporal Convolutional Neural Networks, and Time series clustering. Additionally, a feature engineering ensemble is introduced to extract nuanced temporal features from FTS data.

We demonstrate the effectiveness of our Temporal Ensemble Learning framework through empirical experiments in various Liquidity Pools that Operate OnChain within the Uniswap v3 protocol. The results showcase significant improvements in predictive metrics compared with State of the art techniques.

Keywords: *Financial Time Series, Temporal Convolutional Networks, Ensemble Methods*

✉ *Corresponding Author Email : 1 franciscome@iteso.mx ,2 dsanchez@iteso.mx ,3 riemannruiz@iteso.mx*

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Abs. No: 327

Evidence of Symbiotic Convergence in Narrow-Intelligent Market-Making Algorithms on Decentralized Exchanges

J.Francisco MUÑOZ-ELGUEZABAL ✉

Western Institute of Technology and Higher Education, Mathematics and Physics Department, Tlaquepaque, MEXICO

ABSTRACT

In this exploratory study, we enlist the empirical conditions conducive to the convergence of actions between two narrow-intelligent market-making algorithms on Decentralized Exchanges (DEX).

Concepts introduced include Market-Making in centralized markets, Decentralized Exchanges under Ethereum's evolving protocols, and the ongoing discourse on narrow vs. general intelligence in financial algorithms. We also probe for symbiotic actions among agents through evolutionary game theory.

Our central goal is to define terms and conduct data-driven analyses to determine if a template for narrow-intelligent agents can be outlined. This template is then tested in a simulated open market, focusing on tracking plateaus in agent response rates during stability optimization. These observations are conducted under various market conditions, including perturbations, impact evaluation approaches, and information regimes.

Throughout this exploration, we pose fundamental questions that guide our iterative process. We consider concise market perturbation definitions and we propose an empirical framework with for objectively assessing trust, incorporating perception, generative expectations, and subjective evaluation within a collective context.

This study contributes to the evolving understanding of algorithmic behaviors in decentralized financial markets, analyzing the OnChain transactions on Uniswap V3 LiquidityPools and successfully identify wallets that do show evidence of collaboration in “Wash Trading”, “Pump and Dump” types of behaviors.

Keywords: *Game Theory, Time series, Subsequential clustering*

✉ *Corresponding Author Email : 1 franciscome@iteso.mx*

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Sm+3 and Gd+3 co-doped ceria based solid electrolytes

Aliye ARABACI ✉

Istanbul University-Cerrahpaşa, Faculty of Engineering, Department of Chemical Engineering, 34320 Istanbul, TURKEY

ABSTRACT

Ceria doped with rare earth ions, such as Sm+3,Gd+3 has been considered one of the most promising solid electrolytes for intermediate temperature solid oxide fuel cells. The current trend is to investigate co-doping approach in ceria to further improve ionic conductivity. In the present study, Cerium nitrate hexahydrate, Gadalanium nitrate hexahydrate, Samarium nitrate hexahydrate salts were used as the starting materials to form co-doped ceria electrolytes (Ce0.80GdxSm0.20-xO1.90) by using the Pechini method. X-ray diffraction (XRD), scanning electron microscopy (SEM), and electrochemical impedance spectroscopy (EIS) were using to characterize for microstructural and physical properties of the samples. Microstructural and physical properties of the samples were characterized with X-ray diffraction, scanning electron microscopy, thermogravimetric analysis methods. XRD patterns of the all prepared compositions show the formation of the cubic fluorite-type structure. The effects of the co-dopant on the ionic conductivity of the ceria based electrolytes were investigated.

Keywords: *Rare earth ions , co-dopant , SEM*

✉ *Corresponding Author Email : aliye@iuc.edu.tr*

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Structural, Electronic, Optical and Magnetic Properties of CuMnInSe3 compound.

Fetah SABAH[1,2] , Didaoui SAADIA[2]

[1] Department of Physics, University of M'sila, 28000, ALGERIA

[2] Laboratory of materials and renewable energy, University of M'sila, 28000, ALGERIA

ABSTRACT

The structural, electronic, magnetic and optical properties of the newly synthesized quaternary chalcogenide, CuMnInSe3 were studied, after confirming the stability of its tetragonal cells structure with similar magnitudes to the parents chalcopyrite structures CuInSe2 , according to the available experimental results.

The study was carried out using the first principle calculations based on the density functional theory (DFT), using the full potential linearized augmented plane wave (FP-LAPW) approaches included in the (WIEN2k) code. The structural and elastic properties were explored in detail by using the generalized gradient approximation for solids (GGA-PBEsol) to treat the exchange-correlation effects. As the studied compounds contain transition metals distinguished by a partially filled "3d" electron state, the functional approximation (TB- mBJ) was used in addition to the (GGA-PBEsol) to study the other physical properties. The compound is opaque and exhibits a significant absorption in the ultraviolet range.

Keywords: *Chalcogenide, electronic structure.magnetic and optical properties.*

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Abs. No: 333

Fusion and Heat Affected Zones Damage During Fatigue Assessment Assisted with Digital Image Correlation

Amina SRIBA ✉
Research Centre in Industrial Technologies - CRTI P.O.Box 64, Cheraga 16014 Algiers, ALGERIA

ABSTRACT

3D Digital Image Correlation (3D DIC) is an optical noncontact method for strain measurement. DIC measurement principle consists in comparing the intensity of gray before and after deformation by determining the distance between tow point on the surface of the specimen and calculating strain value. The accuracy of 3D DIC measurement in welded joints is to clearly show the strong effect of inhomogeneous microstructural on stress distribution and its growth during cyclic loading until the final failure of the material.

This work aims at following strain field expansion incurred in welded austenitic stainless steel during its cyclic loading assisted by DIC. The latter is an indicative device helping to distinguish the high stressed from the low stressed area during fatigue test. DIC monitoring of strain field and stress condensation in the studied area reveals the presence of simultaneous strain localization in two regions bordering between them an area with a relatively reduced stress level. This deformation tendency has persisted for a long time during fatigue life and then turned into an abrupt failure in the fusion zone of the welded joint [1].

Keywords: *DIC, Fatigue, welded joint*

✉ *Corresponding Author Email : amina.sriba@gmail.com ; a.sriba@crti.dz*

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Abs. No: 334

Desing and Economic Analysis of a Grid-Tied Microgrid Using Homer Software

Mehmet DAYIOĞLU[1] ✉, Rıdvan ÜNAL[2]
[1] *Afyon Kocatepe University, Electrical-Electronics Engineering Department, Afyonkarahisar-TURKEY*
[2] *Afyon Kocatepe University, Electrical-Electronics Engineering Department, Afyonkarahisar-TURKEY*

ABSTRACT

The demand for electrical energy is increasing due to reasons such as economic growth, industrialization and electrification. The world responds to a large part of this electricity demand with fossil fuel-based production. However, the constraints on the sustainability of fossil resources and the negative effects of fossil-based production on nature have made renewable energy one of the most talked about concepts in the energy sector in recent years. After Russian – Ukrainian conflict, the effects of political crises between countries were seen in the field of energy, and many countries faced the risk of energy supply and high pricing policies. With its easy integration of renewable energy and its structure that reduces dependency in energy, Microgrids (MGs) are important for the energy systems of the future. However, the environmental dependence of renewable energy prevents it from being used as an absolute energy source in systems. With this study, a microgrid design for the city of Duquesne, USA whose main sources of electricity generation are solar and wind, has been realized and electrical and economic analyzes have been made over different scenarios as grid-tied, limited grid activation and standalone. Scenarios are evaluated on Net Present Cost (NPC), Leveled Energy of Cost (LEOC), installation cost and renewable penetration.
The grid-tied scenario, which reduces the LCOE by around 33% compared to the existing grid has been determined as the most economic option.

Keywords: *Microgrid, Renewable Energy Sources, Economic Analysis*

✉ *Corresponding Author Email : mehmet.dayioglu@usr.aku.edu.tr*

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Comparison of Different Forecasting Techniques for Microgrid Load Based on Historical Load and Meteorological Data

Mehmet DAYIOĞLU[1] ✉, Rıdvan ÜNAL[2]
[1] Afyon Kocatepe University, Electrical-Electronics Engineering Department, Afyonkarahisar-TURKEY
[2] Afyon Kocatepe University, Electrical-Electronics Engineering Department, Afyonkarahisar-TURKEY

ABSTRACT

Microgrids (MGs) are structures that provide electrical energy to the loads with Distributed Energy Resources (DERs), energy storage systems and control mechanisms. An MG can be operated either grid-tied or islanded mode. However, DERs, which are generally consist of renewable resources, may have difficulty in providing uninterrupted energy due to environmental dependencies in energy production. Considering the necessity of voltage and frequency synchronization for the systems connected to the grid and the need for uninterrupted energy to the loads for systems separate from the grid, it is seen that the energy production in the MG should be done in a planned manner. Therefore, load and renewable energy sources forecasting is especially important for MGs. It can be used to plan the operation of generation units with short-term load forecast, as well as adding extra generation units or determine the contract details with medium and long-term forecast. In this study, the load profile of an MG was estimated using historical load, weather and historical parameters. Forecast outputs for linear regression, regression tree, support vector regression, gaussian process regression and Artificial Neural Network (ANN) methods were evaluated by performance metrics and the most suitable algorithm for this data set was tried to be found. As a result of the estimations made for the next year in the model trained on seven years of previous data, it was observed that the Average Absolute Percent Error (MAPE) value of the ANN method fell below 4% for this model.

Keywords: *Microgrid, Load Forecasting, Artificial Neural Network*

✉ *Corresponding Author Email : mehmet.dayioglu@usr.aku.edu.tr*

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Abs. No: 336

Study the Cyclone Effect on Gas- Pollutants Concentration of JUST Medical-Waste Incinerator

Bilal Mahmoud ABU-ZRAIQ, Lua'y ZEATOUN
Chemical Engineering Department Jordan University of Science and Technology Irbid, JORDAN

ABSTRACT

A research was conducted to examine the influence of a cyclone on the concentration of gaseous pollutants from the recently established cyclone at the JUST medical waste incinerator. This facility handles medical waste from both public and private health institutions. Measurements were taken for 8 hours daily over five days on each 25kg batch of medical waste, following a specific operational procedure. Pollutant gas levels (CO, CO2, NO, NO2, and NOx) were recorded before and after the cyclone intervention using dual gas analyzers concurrently. Within this timeframe, average gas concentrations were computed. Findings revealed reductions in the concentrations of CO by 54.4%, CO2 by 8.7%, NO by 37.4%, NO2 by 47.9%, and NOx by 38.17%. These outcomes suggest that the cyclone effectively reduced gaseous pollutants and was proficient in segregating pollutants from the exhaust gases mixed with fly ash produced during incineration. Additionally, the response surface methodology, specifically the box-Behnken design approach, was utilized to assess the combustion and separation efficiencies based on the air valve opening percentage, batch volume, and burning duration. Optimal results were identified at 60% air valve opening, with an 18.4 kg batch size, and 18.5 minutes of burning. Under these conditions, the cyclone's separation efficiency was 55%, closely approaching the maximum observed efficiency of 57%.

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Abs. No: 338

Impact of Silicon Surface Modification on the Catalytic Performance Towards CO2 Conversion of Cu2S/Si-Based Photocathodes

Karima BENFADEL[1] ✉, Sabiha ANAS BOUSSAA[1], Lamia TALBI[1], Afaf BRIK[1], Assia BOUKEZZATA[1], Djaouida ALLAM[2], Yahia OUADAH1, Hamid MENARI[1], Amar MANSERI[1], Samira KACI[1]

[1] CRTSE : Centre de recherche en technologie des semi-conducteurs pour l'énergitique, 02 Bd Frantz Fanon- Alger. B.P. 140, les sept Merveilles, Alger16038, ALGERIA

[2] Mouloud Mammeri University of Tizi Ouzou, Laboratory of Applied Chemistry and Chemical Engineering, Sciences Faculty, LCAGC-UMMTO, Tizi Ouzou. ALGERIA

ABSTRACT

In order to prevent global warming, which is mainly caused by the increase in carbon dioxide level in the atmosphere, it is interesting to produce renewable energy in the form of chemical energy by converting carbon dioxide into alternative fuels and other energy-dense products. Photoelectrochemical reduction of carbon dioxide to value-added products and fuels is a promising and current method.

The objective of our study is to develop Cu2S-based photoélectrodes, in which Cu2S is used as CO2 photoelectrocatalyst deposited on nanostructured silicon substrates. Cu2S thin layers were deposited using the chemical bath deposition (CBD) technique. Silicon nanowires and nanopyramids were obtained by alkaline etching. SEM and UV-visible spectroscopy were used to analyse morphology and optical characteristics. By using a potentiostat station, we characterized the photoelectrochemical properties. We performed cyclic voltammetry in presence and without CO2 purging as well as linear voltammetry (LSV) in the dark and under white light irradiation. We perform chronoamperometry to study the stability of our photocathodes. The quality of the nanowires and nanopyramids was visible in the SEM images, and after Cu2S deposition, we could see how the deposition was distributed over the textured surfaces. The inclusion of the Cu2S layer applied on textured substrates significantly reduces the reflectance (R%). The catalytic performance towards CO2 conversion of Cu2S/Si- based photocathodes revealed that the texturing of the silicon surface with nanowires and pyramids have a better photoelectrochemical behavior than those without surfaces modifications.

Keywords: *CO2 conversion, Silicone nanostructured, Cu2S photocathode*

✉ *Corresponding Author Email : benfadelkarima@gmail.com*

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Structural parameters and optical properties of zinc blende and wurzite CdS

Abdelghani KHALDI [1,2] ✉, Nadir BOUARISSA [3], Laurent TABOUROT [4]

[1] *Department of Mechanical Engineering, Faculty of Sciences and Technology, University Mohamed El Bachir El Ibrahimi of Bordj Bou Arreridj, El-Anasser 34030, ALGERIA*

[2] *Laboratory of Materials and Electronic Systems (LMSE), University Mohamed El Bachir El Ibrahimi of Bordj Bou Arreridj, El-Anasser 34030, ALGERIA*

[3] *Physics Department, Faculty of Science, University of M'sila, 28000 M'sila, Algeria*

[4] *Université Savoie Mont Blanc, SYMME, Annecy F-74000, FRANCE*

ABSTRACT

The structural parameters and optical properties of CdS material in the zinc-blende and wurtzite structures have been studied at zero and under elevated hydrostatic pressure using the density functional theory (DFT) within the pseudo-potential method. The code Cambridge Serial Total Energy Package (CASTEP) has been used within an exchange and correlation potential treated in the generalized gradient approximation (GGA). Characteristics like structural parameters, direct and indirect transitions, refractive index, dielectric function, optical absorption, conductivity, reflectivity, and loss function have been calculated in both zinc-blende and wurtzite structures and their dependence on pressure have been considered and discussed. This may provide the material of interest in various optoelectronic applications.

Keywords: *Optical characteristics; CdS; Ab initio; Pressure effect.*

✉ *Corresponding Author Email : a.khaldi@univ-bba.dz*

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Electronic structure and optical characteristics of CuO and Cu2O materials

Abdelghani KHALDI [1,2] ✉, Nadir BOUARISSA [3], Laurent TABOUROT [4]
[1] *Department of Mechanical Engineering, Faculty of Sciences and Technology, University Mohamed El Bachir El Ibrahimi of Bordj Bou Arreridj, El-Anasser 34030, ALGERIA*
[2] *Laboratory of Materials and Electronic Systems (LMSE), University Mohamed El Bachir El Ibrahimi of Bordj Bou Arreridj, El-Anasser 34030, ALGERIA*
[3] *Physics Department, Faculty of Science, University of M'sila, 28000 M'sila, Algeria*
[4] *Université Savoie Mont Blanc, SYMME, Annecy F-74000, FRANCE*

ABSTRACT
The electronic band structure and optical characteristics of CuO in the mono-clinique system and Cu2O in centered cubic system materials have been studied using the wave plane pseudo-potential planes within the generalized gradient approximation (GGA). The energy spectrum obtained according to high symmetry directions in the Brillouin zone are presented and discussed. A comparison has been made between the dielectric function, refractive index, optical absorption coefficient spectrum, conductivity, loss energy function of electrons and reflectivity of the materials CuO and Cu2O.

Keywords: *Electronic structure; Optical characteristics; CuO; Cu2O; Ab initio calculations.*

✉ *Corresponding Author Email : a.khaldi@univ-bba.dz*

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Creep coefficient for self-compacting concrete (SCC)

Hajdar SADIKU[1], Mazllum KAMBERI[1] ✉, Gazmend NAFEZI[2]

[1] University of Prishtina ''Hasan Prishtina'', Faculty of Civil Engineering, Prishtinë-Republic of KOSOVA

[2] University of Prishtina ''Hasan Prishtina'', Faculty of Mathematical and Natural Sciences, Prishtinë-Republic of KOSOVA

ABSTRACT

With the development of construction technology self-compacting concrete has started to be widely used in the construction of buildings. The specific properties of self-compacting concrete have made it particularly useful for concreting the structural elements of high-rise buildings.

The strains characteristics of concrete are important to know both in the initial stage of concreting and in the long process in order to take measures to minimize their impact on cracking and reduction of structure elements.

In this regard we have conducted an experiment to investigate shrinkage strains and creep strains in reinforced concrete beams as well as the determination of the creep coefficient.

Given that the shrinkage and creep strains are together it is necessary to separate the creep strains from the shrinkage strains to determine the creep coefficient. For the realization of this separation we have prepared the same samples which have been used for the determination of shrinkage strains and samples which have been inserted into the mechanisms for the realization of adequate force for the determination of the creep strains.

In this paper will be presented the results for the mechanical characteristics of self-compacted and normal concrete such as: Solidity in compression, modulus of elasticity, Tensile splitting strength.

The results for shrinkage and creep strains and the results for the creep coefficient for normal concrete and for self-compacted concrete will also be presented.

Keywords: *Self-Compacting Concrete; Modulus of elasticity; compressive strength; shrinkage; creep*

✉ *Corresponding Author Email : mazllum.ing@gmail.com*

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Bio-molecule as a sustainable protection against corrosion of ductile iron in acid solution: Experimental and computational studies

Brahim IDIR[1] ✉, Farida KELLOU-KERKOUCHE[2], Lynda BENHADDAD[3] , Mustapha DJAMA[1] , Amel KOUACHE[1]

[1]Research center in industrial technologies (CRTI), P.O. Box 64, Cheraga 16014 Algiers- ALGERIA.

[2]USTHB, Laboratoire d'Electrochimie-Corrosion, Métallurgie et Chimie Minérale Faculté de Chimie BP32 El-Alia Bab-Ezzouar, Algiers-ALGERIA.

[3] Laboratoire Des Sciences Des Matériaux Et de L'Environnement (LSDME), Département Des Sciences de La Matière, Faculté Des Sciences, Université Alger 1, Benyoucef Benkhedda, 02 Rue Didouche Mourad, 16000 Algiers- ALGERIA.

ABSTRACT

The present work is devoted to study the inhibition effect and adsorption mechanism of Loratadine (LRD) on cast iron in 1 M HCl. Polarization curve, electrochemical impedance spectroscopy (EIS) and surface analysis were carefully investigated to indicate the inhibition effect of LRD on cast iron in 1 M HCl. On the other hand, Theoretical study evidenced the good loratadine reactivity toward cast iron surface. Polarization curves revealed that LRD behaves as mixed type inhibitor. The inhibition efficiency increased with the increasing concentration of LRD and reached 91 % (by EIS) at 0.46 mM of inhibitor. It showed that the adsorption of LRD on cast iron surface followed the Langmuir isotherm. The value of $\Delta G°ads$ (-37.52 kJ/mol) and the effectiveness of LRD at high temperatures, suggest physico-chemical interactions of LRD with the cast iron surface. A good correlation was made between some electronic properties of LRD molecules and adsorption mode. The obtained results showed that Loratadine is an efficient corrosion inhibitor for cast iron in 1 M HCl.

Keywords: Corrosion inhibitor, EIS, Quantum calculations, Biomolecule

✉ *Corresponding Author Email : b.idir@crti.dz*

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A New Framework to Cybersecurity Strategies for Protecting Computer Networks

Adnan A. HNAIF ✉
Al-Zaytoonah University of Jordan, Cybersecurity Department, Amman-JORDAN

ABSTRACT

Cybersecurity threats are constantly evolving, requiring new frameworks to protect computer networks. This paper proposes a new cybersecurity strategy combining artificial intelligence, blockchain technology, and advanced encryption to create an intelligent, decentralized security system. A cognitive system using machine learning analyzes network traffic in real-time to identify anomalies and emerging threats. Blockchain architecture provides a tamper-proof ledger of all network activity and transactions. Encryption algorithms secure data in transit and at rest. Together, these technologies allow for proactive threat detection, access control, and data protection. Simulations demonstrate the system's ability to detect zero-day attacks with 95% accuracy and near-immediate response time. With cyberattacks growing in frequency and sophistication, this new framework represents a paradigm shift in network security, moving from reactive to predictive defense.

Keywords: *cybersecurity, network security, blockchain, encryption, artificial intelligence*

✉ *Corresponding Author Email : adnan_hnaif@zuj.edu.jo*

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Evaluation of the Effect of Infill Patterns and Orientations on Mechanical Properties of 3D-printed samples

Farıd BETTINE[1,5], Ammar HABOUSSI[2,3] ✉, Fayçal BOUZID[2] , Bouchoul BOUSSAHA[2], Rafık MAHDAOUI[4], Fayssal BOUFELGHA[2]

[1] *Institute of optics and precision Mechanical,University Ferhat Abbas Sétif 1, Sétif 19000, Algeria*

[2] *Research Centre in Industrial Technologies CRTI, P.O.Box 64, Cheraga 16014 Algiers, Algeria*

[3] *Laboratory of Automation and Manufacturing,University of Batna2, Algeria*

[4] *Laboratory of Knowledge Engineering and Computer Security , University of KHENCHELA*

[5]*Laboratory of Nonmetallic materials, Sétif, Algeria*

ABSTRACT

Additive manufacturing is a technology that is developing rapidly in various fields because it allows the manufacture of parts with complex shapes that are difficult to achieve by traditional manufacturing methods. The aim of this work is to examine the effect of the infill pattern orientation on the quality of 3D printed products in order to improve our understanding of the anisotropic behavior at higher resolution. Thus, in order to analyze the mechanical properties and evaluate the tensile strength, we tested four sample printing models: linear, grid, honeycomb and octagonal using Z-ULTRAT (ABS plastic blend) samples, which were printed with 50% infill density in different orientations (0°, 30°, 45°, 60° and 90°), using the Zortrax M300-plus printer.

It has been found that the internal arrangement of the infill pattern significantly affects the mechanical properties of parts printed in Z-ULTRAT material. Additionally, the combination of different infill patterns and layer stacking sequences has been found to affect the tensile strength of FDM printed parts. The obtained results are of great importance for engineers and designers who want to take into account the anisotropy of their prints and highlight the importance of taking infill patterns and orientation into account when optimizing the mechanical properties of parts made of Z-ULTRAT plastic in 3D-printing.

Keywords: *Additive manufacturing, Z-ULTRAT, tensile strength, mechanical properties, FDM.*

✉ *Corresponding Author Email : amar1975barika@yahoo.fr*

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Investigation On Mechanism Formation Of Silver-Aluminum Contact On P+ Emitters

Abdelghani BOUCHEHAM[1] ✉, Ahmed Bahaeddine BENSEDIRA[2], Hakim KORICHI[2], Abbes MARREF[1], Chahinez NASRAOUI[1], Boutaleb LABDELLI[1], Lyes BENHERRAT[1] and Abdelkader DJELLOUL[1]

[1] *Research Center on Semiconductors Technology for Energetics, CRTSE, DDCS, Algiers-ALGERIA*
[2] *Yahia Fares University/Department of mechanical engineering/LMP2M, Medea, ALGERIA*

ABSTRACT

Adding aluminum to silver metallization pastes has been observed to reduce the contact resistivity of silver metallization on p- type emitters used in n-type silicon solar cells. However, this addition of aluminum also leads to increased surface recombination that limits the efficiency of the solar cell. There is a need to gain a comprehensive understanding of how aluminum contributes to lowering contact resistivity. İn this work , the effects of aluminum addition in the range of 1 to 9 per cent to silver paste on the microstructure and the morphologie of screen printed contact were investigated. The scanning electron microscope (SEM) images show the presence of silver colloids at the interface silicon- metallic electrode, while the x-ray diffraction analysis (XRD) confirms the formation of silver – aluminum alloy.

Keywords: *Solar cells, n-type silicon, p-type emitter, metallization, screen printing, silver and aluminum pastes*

✉ *Corresponding Author Email : a_boucheham@crtse.dz*

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Experimental and theoretical studies on the anticorrosion performance of co- polymeric coatings on X70 steel in 3.5% NaCl.

Mustapha DJAMA[1] ✉, Lynda BENHADDAD[2], Brahim IDIR[1] , Imene LADRAA[2] , Chahinez BOUZID[2]

[1] Research Center in Industrial Technologies (CRTI), PB 64, Chéraga, Algiers, ALGERIA

[2] Sciences faculty, Université Alger 1, Benyoucef Benkhedda, 02 Rue Didouche Mourad, 16000, Algiers, ALGERIA

ABSTRACT

Polymeric coatings are used to protect metallic surfaces from corrosion in a marine environment. The novelty of this research lies in the combination of two conductive polymers, namely Polypyrrole (PPy) and Ortho-toluidine (OT), which were tested for their corrosion resistance on steel in a chloride medium. The polymers were synthesized electrochemically using the galvanostatic mode.

The corrosion properties were studied using electrochemical methods such as the evolution of open-circuit potential over time and polarization curves. The purpose of this research is to enhance the protective capabilities of polymeric coatings by combining these two polymers. Initially, layers of PPy and OT were deposited on X70 carbon steel. The focus was on optimizing single layers of PPy alone before enhancing the coatings with PPy/OT bilayers. The results indicate that the application of PPy and OT copolymerization could significantly improve the corrosion resistance of tool steel structures.

To understand the mechanism involved in electrodeposition, it was deemed useful to use quantum calculations based primarily on the density functional theory (DFT). This study highlights the relationship between the structural arrangement, electronic structure, and inhibitory activity of different compounds through a number of quantum descriptors such as the highest occupied molecular orbital/lowest unoccupied molecular orbital (HOMO/LUMO) energy, the ΔE gap, and the dipole moment μ of the surface coating. The results of the DFT calculations obtained are in fairly good agreement with experimental data.

Keywords: Copolymer coating, Corrosion resistance, X70 Steel, DFT

✉ *Corresponding Author Email : m.djama@crti.dz*

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Determination of Levels of Artificial Radioactive Cs-137 Dose in Various Soil Samples in Dilovası-Kocaeli

Osman GÜNAY[1] ✉, Caner YALÇIN[2], R. Taygun GURAY[2], Taylan YETKİN[1]
[1] *Yıldız Technical University, Faculty of Electrical and Electronics Engineering, Department of Biomedical Engineering, Istanbul, TURKEY*
[2] *Kocaeli University, Faculty of Art and Science ,Physics Department, Kocaeli -TURKEY*

ABSTRACT

Artificially generated radioactive cesium-137 (Cs-137) is a radioactive isotope originating from nuclear fission processes. Cs-137 exhibits a half-life of approximately 30 years and possesses the potential for significant health hazards if it is ingested or inhaled, as it can accumulate within the organism and induce cellular and tissue damage. The quantification of Cs-137 dosage assumes paramount importance in the evaluation of potential health ramifications linked to exposure. This becomes particularly salient in regions afflicted by nuclear accidents or incidents involving radioactive materials. Precise measurement of Cs-137 concentrations plays a pivotal role in guiding decisions regarding the necessity of protective interventions and facilitating the development of strategies for risk mitigation.

Methods for ascertaining Cs-137 dosage levels encompass environmental sampling, biological surveillance, and medical imaging. These methodologies entail the utilization of specialized equipment and techniques aimed at detecting and quantifying Cs-137 concentrations across diverse substrates, such as soil, water, and human biological tissues. The determination of artificial radioactive Cs-137 dosages stands as a critical facet of radiation safety, serving to safeguard public health under circumstances where the potential for exposure to this deleterious substance exists.

In the present investigation, we conducted an analysis of artificial radioactive Cs-137 concentrations within soil samples procured from four distinct locations in Dilovası-Kocaeli. Gamma radiation levels were assessed utilizing a high-purity germanium (HPGe) gamma detector."

Keywords: *Dioavası Artificial Radioactive, Cs-137, Soil*

✉ *Corresponding Author Email : ogunay@yildiz.edu.tr*

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Synthesis And Characterization Of EGCG Loaded Silica Nanoparticles

Zeynep YARAR ✉, Ozge KOZGUS GULDU, Emin Ilker MEDINE
Ege University, Department of Nuclear Applications, Institute of Nuclear Sciences, Ege University, Bornova, 35100, Izmir-TURKIYE

ABSTRACT

Cancer is a leading cause of death worldwide. Chemotherapy is not selective and can also affect healthy cells in the body. This can lead to complications in various organs and tissues. The potential to enhance cancer care through nanotechnology is substantial. Nanoparticles can be targeted cancer cells while sparing healthy cells. This targeted drug delivery reduces side effects and enhances the effectiveness of cancer treatments. Mesoporous silica nanoparticles (MSNs) have received due to their tunable particle size, large surface area, stable framework, and easy surface modification. Epigallocatechin-3-gallate (EGCG), is a type of catechin, which is natural compound found in green tea and some studies suggest that EGCG may help prevent the growth of cancer cell. In this study, mesoporus silica nanoparticles (MSNs) loaded with EGCG, were synthesized and characterisation studies were conducted. Size, morphology and EGCG loading capacity of the synthesized nanoparticles were analyzed and optimum conditions were determined. Characterization of nanoparticles was performed by Dynamic Light Scattering (DLS), Transmision electron microscope (TEM). According to the DLS analysis, the MSN size was 156,3±13nm, the polydispersity index (PdI) was 0.19 and zeta potential was -19,1mV. According to the TEM analysis, the synthesized nanoparticles are monodisperse and spherical morphology in the range of 50nm. Encapsulation efficiencies of the EGCG molecule were 69,84±4,25%. This research summarises MSNs with tunable pore volume as well as the approach of EGCG loading. It is thought that the optimized MSNs encapsulated with EGCG will be evaluated to be used in drug delivery system.

Keywords: MSN, EGCG, Drug Delivery

✉ *Corresponding Author Email : zeynepyarar85@gmail.com*

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Simulation of hydrogen liquefaction and optimization of energy consumption

Ahmed BELGACEM[1] ✉, Abdelhamid M'RAOUI[2]

[1] *University of Science and Technoogy Houari Boumedien...Algiers..ALGERIA*

[2] *CDER, Algiers, ALGERIA*

ABSTRACT

Hydrogen appears as one of the most promising energy vectors for an energy system. It plays a significant role in reducing greenhouse gas emissions. Besides, it is versatile enough to be transported and stored in liquid form.

The raw materials necessary for hydrogen production are abundant on earth and can be produced from many sources: water, biomass, and hydrocarbons. The mode of hydrogen production is the determining factor of its environmental performance. It represents a highly sustainable fuel and energy vector when produced from renewable energy.

The liquefaction of hydrogen is a cost-effective means, although its process is energy-intensive. The distribution and storage of hydrogen in liquid form are among the most feasible options in terms of energy density and technical and economic prospects.

The objective of our work is to carry out a technical study through simulation using Aspen Hysys software of the Cascade system for hydrogen liquefaction as well as its production through renewable energies. The performance of this system and the influence of certain parameters such as energy consumption, energy transfer, coefficient of performance, and energy efficiency were evaluated.

The energy consumed for the production of liquid hydrogen was estimated by the HOMER simulator. The energy study carried out on allowed to choose several sources of renewable energy for the simulation and optimization of our system. In order to estimate the amount of hydrogen produced by renewable energies, as well as the electrical load required to power our cycle.

Keywords: *Hydrogen, liquefaction, storage, simulation*

✉ *Corresponding Author Email : belgacem.gp@gmail.com*

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Abs. No: 356

Applications on Autoregressive Conditional Duration Model and Minimum Distance Estimation

Erdem ŞEN ✉, Ali Hakan BÜYÜKLÜ
Yildiz Technical University, Statistics Department, Istanbul-TÜRKIYE,

ABSTRACT

This paper investigates the autocorrelation structure of Autoregressive Conditional Duration (ACD) model and the use of the Minimum Distance Estimation (MDE) method for the model calculations. Efficiency of MDE method is tested by Monte Carlo simulations using Weibull distribution which was suggested by Engle and Russel before. For real-life applications, durations data of financial prices and seismic aftershocks are used. Simulation results show that under leptokurtic distribution properties MDE estimators are mostly better than Maximum Quasi-Likelihood's (MQL). Real-life applications show that MDE method produces smaller persistence values and can reduce the autocorrelation in residuals better than MQL method.

Keywords: *Autoregressive Conditional Duration, Minimum Distance Estimation, autocorrelations*

✉ *Corresponding Author Email : erdem.sen1@std.yildiz.edu.tr*

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Machine Learning for Phase Diagram Construction: A Data-Driven Approach

Oussama SAMAI, Rayane KARIM ✉, Allaoui OMAR
Université Amar Telidji, Mechanical Department, Laghouat-ALGERIA

ABSTRACT

In materials science, the construction of phase diagrams is a pivotal task, providing essential insights into material behavior across different compositions and temperatures. Traditional methods for phase diagram development involve intricate thermodynamic calculations and extensive experimentation. However, the emergence of machine learning has revolutionized this process.

This study outlines the use of machine learning techniques for expeditious and accurate phase diagram construction. It harnesses extensive datasets of materials properties and phase information to predict phase boundaries and regions effectively.

The process begins with collecting and preprocessing a comprehensive dataset containing composition, temperature, and phase data from various sources. Machine learning models, including decision trees, random forests, support vector machines, and neural networks, are trained on this dataset using supervised learning methods, where phase information serves as the target variable. Rigorous validation and evaluation ensure the models' reliability.

Once trained, these models predict phase boundaries, regions, and fractions across a range of compositions and temperatures, facilitating rapid phase diagram construction. Visual representations such as contour plots and ternary diagrams offer valuable insights into material behavior and phase transitions.

Machine learning-based phase diagram construction accelerates research, reduces experimentation costs, and accommodates complex multi-component systems. Moreover, it empowers the exploration of phase behavior in novel materials, opening doors to innovative material compositions with tailored properties.

Keywords: *Phase diagrams, Machine learning, Alloys, CALPHAD*

✉ *Corresponding Author Email : rayanek@lagh-univ.dz*

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Utilizing Inverse Problem Approaches for the Determination of Interdiffusion Coefficients in Materials Science

Bendeb ASMA, Rayane KARIM ✉, Allaoui OMAR
Université Amar Telidji, Mechanical Department, Laghouat-ALGERIA

ABSTRACT

This presentation highlights the application of inverse problem methodologies to accurately determine interdiffusion coefficients in materials science. Interdiffusion coefficients are crucial for understanding material behavior, yet their precise measurement, especially in multi- component systems, presents a formidable challenge.

The process begins with comprehensive data acquisition, encompassing composition and temperature profiles, serving as the foundation for the inverse problem formulation. A suitable mathematical model describing the interdiffusion process is developed, integrating relevant thermodynamic and kinetic factors.

Inverse problem techniques, including Bayesian inference and optimization algorithms, are employed to minimize the discrepancy between model predictions and experimental data. Robust uncertainty quantification methods ensure the reliability of obtained coefficients. A numerical example with accurate results is presented; where validation against independent experimental data reinforces the accuracy of the determined interdiffusion coefficients, enabling their application in predicting material behavior under various conditions. This iterative approach allows for continuous refinement as new data becomes available.

Inverse problem approaches offer a promising pathway to advance our understanding of interdiffusion phenomena, particularly in complex systems. By leveraging computational tools, researchers can extract precise interdiffusion coefficients, facilitating the design of materials with tailored properties and enhancing the efficiency of materials development.

This abstract highlights the potential of inverse problem methodologies as a valuable tool in materials research, enabling the accurate determination of interdiffusion coefficients and furthering our ability to engineer materials with tailored properties and performance characteristics.

Keywords: *multicomponent diffusion, interdiffusion coefficients, Inverse problems*

✉ *Corresponding Author Email : rayanek@lagh-univ.dz*

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Theoretical investigation of the optical properties of the Hg2CuTi-type full-heusler compound Ti2NiZ(Z=Al,Ga)

Sabah FETAH[1,2]✉, Walid MENASRI[1,2] , Sansabilla BOUCHAREB[3]

[1]*Physics department, Faculty of science, University of M'sila, 28000 M'sila, ALGERIA*

[2]*Laboratory of materials and renewable energy, Faculty of science, University of M'sila, 28000 M'sila, ALGERIA*

[3]*Physics department, Faculty of science, University of ADRAR, 01000 ADRAR, ALGERIA*

ABSTRACT

We usedthe density functional theory to study the optical properties of Hg2CuTi- type full-heusler compound Ti2NiZ(Z=Al,Ga), after confirming the stability of their cubic cell structure at optimized lattice constant a0=6.13 $AA0$ and a0=6.1 $AA0$ for Ti2NiAl and Ti2NiGa respectively . The study was carried out using the full potential linearized augmented plane wave approaches. And by using the generalized gradient approximation for solids to treat the exchange-correlation effects in addition to the (TB-mBJ).

These two ferromagnetic compounds , Ti2NiAl and Ti2NiGa, exhibit half-metallic behavior with an indirect band gap ($\Gamma - X$) of Eg=0.52 eV and Eg=0.61 eV respectivly and a total magnetic moment of $3\mu\mu B$. The optical properties were predicted and the spectra of the real and imaginary parts of the permittivity, reflectivity function, the absorption coefficient, were analyzed. These calculations indicat that these materials are useful as optical switch or filter for infrared to visible energies since the components of the dispersive part of the dielectric function lie in the visible region (1.7–3.3 eV) and show transitions from dielectric to metallic.

Keywords: *Electronic properties, half metallic, ferromagnetism, magnetic moment, spin polarization, optical conductivity*

✉ *Corresponding Author Email : sabah.fetah@univ-msila.dz*

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Ionospheric plasma parameters derived from the power spectrum of the EISCAT Svalbard radar

Bashkim DALIPI[1], Naim SYLA[2]✉, Fisnik ALIAJ[2], Arbër ZEQIRAJ[3], Donat DALIPI[4]

[1] *University "Kadri Zeka", Faculty of Education, Zija Shemsiu Str.nn,60000 Gjilan - KOSOVO*

[2] *University of Prishtina, Department of Physics, Eqrem Cabej Str.51,10000 Prishtina - KOSOVO*

[3] *University of Mitrovica, Department of Materials and Metallurgy, PIM-Trepça, Mitrovica - KOSOVO*

[4] *University "Kadri Zeka", Faculty of Computer Science, Zija Shemsiu Str.nn,60000 Gjilan- KOSOVO*

ABSTRACT

The autocorrelation function (ACF) of the received incoherent scatter signal contains valuable information on ionospheric plasma parameters such as electron density, electron and ion temperature, ion drift velocity, and quantities such as Te/Ti and Ti/mi ratio that are extracted directly from the power spectrum of an incoherent radar. In this research, we used raw data sets obtained by the 42-meter EISCAT Svalbard radar to derive ionospheric plasma parameters. The methodology that we used is based on the Real-Time Graph (RTG) and The Grand Unified Incoherent Scatter Data Analysis Program (GUISDAP). The results were analyzed and discussed in terms of the electron density profile (ne) and other plasma parameters throughout the ionospheric altitude seen by the radar.

Keywords: *Ionospheric physics, radar science, plasma diagnostics, power spectrum*

✉ *Corresponding Author Email : naim.syla@uni-pr.edu*

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Computer modeling of incoherent scattering spectrum

Donat DALIPI[1], Naim SYLA[2]✉, Fisnik ALIAJ[2], Arbër ZEQIRAJ[3], Bashkim DALIPI[4]✉,

[1] University "Kadri Zeka", Faculty of Computer Science, Zija Shemsiu Str.nn,60000 Gjilan-KOSOVO

[2] University of Prishtina, Department of Physics, Eqrem Cabej Str.51,10000 Prishtina - KOSOVO

[3] University of Mitrovica, Department of Materials and Metallurgy, PIM-Trepça, Mitrovica - KOSOVO

[4] University "Kadri Zeka", Faculty of Education, Zija Shemsiu Str.nn,60000 Gjilan - KOSOVO

ABSTRACT

A wide range of phenomena are represented by signals, which are directly related to the physical quantities that store energy and power in a physical system. Fundamental details about plasma characteristics, such as electron density, etc., can be found in an incoherent scatter signal in the ionosphere of the earth. Ion-acoustic and plasma lines make up the power spectrum of an incoherent radar. The ion line's size and shape are sensitive functions of relevant plasma quantities. We have used computer modeling to examine how sensitive these lines are to variations in the ionospheric parameters such as ion temperature (Ti), ion mass (mi), ion velocity (vi), ion composition, and electron density (ne), as well as radar frequency dependencies.

Keywords: *Computer modeling, ionospheric physics, radar science, power spectral density*

✉ *Corresponding Author Email : bashkim.dalipi@uni-gjilan.net*

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The probabilities of hyperfine- induced electric dipole transitions of x-line in He-like ions with nuclear spin I=3/2 excited by impact of electron beam.

Rahma BENSAID ✉, Fatima Z.GHALEM

A. Belkaid University, Physics Department, Tlemcen-ALGERIA

ABSTRACT

The presence of the hyperfine interaction, in ions that have a non-zero nuclear spin I, not only moves and divides the individual J levels, but also mixes the different J levels. The total momentum becomes F = J + I, F therefore takes the values of | J-I | at J + I. For heliumoid ions, the decline from the 1s2p 3P2 level, populated by excitation after e-ion collision, towards the fundamental 1s2 3S0 level, can occur via the electric dipole mode (E1) induced by the interaction hyperfine due to the mixing of the upper level with the 21.3P1 levels, which have very short lifetimes next to the usual magnetic quadrupole transition mode M2. In this work we calculated the probabilities of hyperfine- induced electric dipole transitions ( ) for the x-line due to the 1s2p 3P2→1s2 3S1 decline, as well as for its different hyperfine components. For this we have considered the following He-like ions having a nuclear spin I= 3/2: 23Na(Z=11), 63Cu(Z=29), 71Ga(Z=31), 78As(Z=33), 81Br(Z=35), 87Rb(Z=37) et 159Tb(Z=65). In our calculations we used Mathematica software as we called on high-performance online codes.

Our results show that the values of increase as Z increases while remaining dependent on the value of the magnetic moment μI of each ion. The probabilities of radiative transitions in general represent basic atomic data that can be used in the modeling and diagnosis of hot plasmas that are astrophysical or produced in laboratories [1].

Keywords: *He-like ions, x-line, nuclear spin I, diagnosis of hot plasmas. hyperfine-induced electric dipole transitions.*

✉ *Corresponding Author Email : bensaidrahma70@gmail.com*

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Abs. No: 366

Density dependence of the relative intensity of EUV lines emitted from ArXV ions excited by an electron beam

Souad Wassila RACHEDI ✉, Latifa GUEZZEN

A. Belkaid University, Physics Department, Tlemcen-ALGERIA

ABSTRACT

The intensity ratios of some lines emitted by Be-like highly charged ions in a hot plasma are particularly sensitive to electron density. Such ratios are often used in spectroscopic diagnostics of astrophysical plasmas to deduce ne. This work focuses on density dependence in the 109□1013 cm□3 range of the intensity ratio R of the line 2p2 3P2 →2s2p 3P1 (λ □□254.824 Å) over that of the line 2p2 3P1→ 2s2p 3P0 (λ □□258.763 Å) emitted by argon ions Ar14+ after excitation by a mono-energetic and unidirectional electron beam. Different emission angles θ with respect to the direction of the incident electron beam were considered. A magnetic sublevel-to-magnetic sublevel collisional-radiative model [1] was developed to calculate the populations of the upper magnetic-sublevels of the two lines, including the 46 levels belonging to the nine configurations 2s2, 2s2p, 2p2, 2s3l and 2p3l (l □ 0-2). The atomic data, i.e. radiative transition probabilities and collision strengths used in the calculations were computed with the Flexible Atomic Code [2].

Our results show that for incident electrons energy ei between 1 and 3 keV, the ratio R as a function of electron density can be very different from ⟨*RR*⟩ corresponding to the ratio of the 4□□averaged intensities. For example, for ei □1 keV, R (θ □90°) differs from R (θ □0°) by □26% at low densities (ne □109 cm□3), but this difference becomes less than 20% when the density increase to 1012 cm□3.

Keywords: *beryllium-like ions, anisotropic plasmas, electron-ion collisions, collisional-radiative model, line intensity ratio, density diagnostic.*

✉ *Corresponding Author Email : rachedi_w@yahoo.fr*

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Abs. No: 367

Analytical study to predict the fatigue crack propagation of steel pipeline

Djamel ZELMATI[1] ✉, Riad HAROUZ[2], Oualid GHELLOUDJ[1]

[1] *Research Center in Industrial Technologies (CRTI), P.O. Box 64, Cheraga, Algiers, 16014, ALGERIA*

[2] *Department of Mechanical Engineering, Mohamed Chérif Messaadia University, Souk-ahras, ALGERIA*

ABSTRACT

Steel pipelines transporting oil and gas are subjected to cyclic loading witch can develop fatigue cracks initiation and propagation. Hence, the aim of the current work is to develop a model to predict the number of cycles to failure for an API X60 steel pipe with deferent initial cracks. In order to predict the fatigue behavior of the steel, specimens have been cut from the longitudinal surface of the pipe. For an initial crack length of 5%, the impact of the stress ratio in the range of 0.4□0.8, will generate an increase of the number of cycles to failure from 2.103 cycles to 7.104 cycles. For instance, the increase of the initial crack length from 5% to 10%, at the same stress ratio, will decrease the number of cycles to failure by one-half ratio. In addition, the increase of the initial crack length from 10% to 20%, will increase the number of cycles to failure from 30323 cycles to 65611 cycles. Meanwhile, the fatigue crack growth should be taken into consideration for a safe design, and maintenance at time by taking the initiative to intervene. .

Keywords: *Fatigue, steel pipe, crack, load ratio*

✉ *Corresponding Author Email : d.zelmati@crti.dz*

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Abs. No: 370

Dynamics Analysis Of Functionally Graded Reinforced Carbon Nanotubes Beams Resting On Elastic Foundation

Kenza Djilali DJEBBOUR[2], Mokhtar NEBAB[1,2] ✉, Ait Atmane HASSEN[2], Bennai RIADH[2]

[1] Department of civil engineering, Faculty of technology, University M'Hamed Bougara of Boumerdes, Boumerdes , ALGERIA

[2] Department of civil engineering, Faculty of civil engineering and architecture, University Hassiba Benbouali of Chlef, ALGERIA

ABSTRACT

Functionally Graded Reinforced carbon Nanotubes beams are advanced engineering structures and materials designed for a specific performance or function in which the spatial gradation in structure and composition lend themselves to the appropriate properties.

In this work, vibeations analysis of the Functionally Graded Reinforced carbon Nanotubes beams FG- CNT on Winkler / Pasternak parameter elastic foundation has developed using a simple higher shear deformation theory. In this theory did not needed taken into account coefficient corrector shear deformation and neutral surface of FG-CNT beams is determined .Functionally Graded Reinforced carbon Nanotubes beams properties follow a UD,XD or VD function. It obtained the derivation of the equations of motion by the principle of Hamilton. Analytical Solutions of motions equations are presented for simply supported FG-CNT beams using Navier series. The results are compared with height shear deformation verify the validity of the developed theory. Effects of the parameter of elastic foundation on the stress and displacements are investigated..

Keywords: *FGM , uneven porosity , FSDT , wave propagation.*

✉ *Corresponding Author Email : m.nebab@univ-boumerdes.dz*

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Abs. No: 372

Theoretical study on trinuclear sandwich complexes of cyclooctatetraene [Pd3(COT)2(L)]+2(COT = C8H8 and L = H2O, CO, N2, HCN, HNC, NH3, PH3, PCl3, PF3, CS et CH2)

Akila TAYEB-BENMACHICHE[1,2] ✉, Bachir ZOUCHOUNE[1,3]

[1]*Unité de Recherche Chimie de l'Environnement Moléculaire et Structurale (URCHEMS), Université des frères MENTOURI - Constantine 1, Constantine (25000)- ALGERIE.*

[2]*Faculté de Médecine, Département de médecine, Université Salah BOUBNIDER - Constantine 3, Constantine (25000)- ALGERIE.*

[3]*Laboratoire de chimie appliquée et Technologie des Matériaux, Université Larbi BENMHIDI- Oum El Bouaghi (04000)- ALGERIE.*

ABSTRACT

This paper reports the molecular structure, the electronic structure and the decomposition energies of the [Pd3(COT)2(L)]+2(COT = C8H8 and L = H2O, CO, N2, HCN, HNC, NH3, PH3, PCl3, PF3, CS et CH2) complexes obtained by means of DFT method using BP86 and PW91 functionals with the TZP basis set.

The results showed that the interaction terms are governed by one third covalent and two third ionic characters, in agreement with the ΔEelstat (electrostatic) and ΔEorb (orbital) contributions, respectively, into the total attractive interaction (ΔEelstat + ΔEorb) for the studied complexes except for those of PCl3 and N2 ligands, which are almost of half covalent and half ionic characters. The σ-donation and π-backdonation amonts indicate that the CH2 is the strongest donor ligand ; however, the HCN is revealed to be the weakest σ-donor and π-acceptor one. The σ-donation and π-backdonation are in perfect accord with the natural charges of interacting fragements.

Keywords: *Ligand-Palladium interactions, σ-donation, π-backdonation, energy decomposition.*

✉ *Corresponding Author Email : saratayeb@yahoo.fr*

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Abs. No: 375

Comparison of the thermomechanical behavior of copper-steel and brass-steel tribological couples

Choubeila BOUBECHOU[1], Adel MILES[2], Ali BOUCHOUCHA[2] ✉, Dris BENDJABALLAH[2]

[1] *University of 20 August 1955, Department of Mechanical Engineering, Skikda -ALGERIA*

[2] *University Constantine1, Department of Mechanical Engineering, Mechanical Laboratory, Constantine-ALGERIA*

ABSTRACT

This work focuses on the influence of functional parameters on the thermal and mechanical behavior of copper-steel and brass-steel tribological couples. To this end, friction and wear tests were carried out using a pin-disc tribometer, in an atmospheric environment. This consists of a copper or brass pin rubbing dry against a rotating steel disc. A Comsol Multiphysics numerical code was used to evaluate contact temperature, mechanical stresses and deformations at the interface of the couples. The results obtained show that functional factors have a significant influence on the thermomechanical behavior of the two couples. Indeed, these parameters modify the physicochemical and mechanical properties of the contacts and promote the oxidation process. In addition to the formation of oxides, the mutual material transfer mechanism plays a key role in the friction and wear of the couples. The discussion of the results is based on macroscopic and microscopic observations of worn surfaces and the interfacial phenomena resulting from sliding.

Keywords: *Brass, Copper, Contact temperature, Deformation, Friction, Interface, Steel, Stress, Oxidation, Wear.*

✉ *Corresponding Author Email : bouchoucha_ali1@yahoo.fr*

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Abs. No: 376

Design and production of a mini-turbo reactor and study of its dual-fuel (gas- hydrogen) operation

Adel MILES ✉, Ali BOUCHOUCHA, Dris BENDJABALLAH
University Constantine1, Department of Mechanical Engineering, Mechanical Laboratory, Constantine-ALGERIA

ABSTRACT

The main objective of this work is to study the effects of hydrogen injection on the performance of a mini turbo reactor from the energy and economic side. To do this we have made a mini turbo reactor and a dry-cell electrolyzer (dry cell), we made a theoretical and experimental study to compare the results of the parameters of the mini turbo reactor with the injection of pure propane into the first case and with a propane-hydrogen mixture in the second case. This study has shown that injecting hydrogen into mini-turbo reactors is a rather interesting alternative. It leads to an increase in useful power, a reduction in the flow rate consumed, and a reduction in polluting emissions (CO and CO2).

Keywords: *Mini-turbo reactor, Hydrogen injection, Design, Electrolyzer.*

✉ *Corresponding Author Email : adelmiles25@gmail.com*

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Abs. No: 377

Numerical Study of Epitaxial Misfit Strain Effect on Bandgap fluctuation of the Absorber Material Perovskite CsSn(I1-xBrx)3, and its impact on Photovoltaic Performance of the CsSn(I1-xBrx)3 /SnO2 Solar Cell based Structure

Hayat ARBOUZ ✉
University of Blida1, Department of Physics, Blida-ALGERIA

ABSTRACT

This work concerns a new approach to simulating the performance of the CsSn(I1-xBrx)3 perovskite-based solar cell. Photovoltaic parameters have been evaluated as a function of the variable bromine content of the absorber, described by the x-ratio, taking into account fluctuations in the edges of the conduction and valence energy bands due to the misfit strain that occurs as a result of the lattice constant shift at the front interface between the absorber and the electron transport layer in the epitaxial direction.The simulation model that takes into account the variation of physical parameters with absorber composition has been described, where the impact of the misfit strain due to lattice parameter misalignment on the fluctuation of bandgap energy has been evaluated according to strain theory. Simulation results when this impact is taken into account have been discussed and compared with results obtained when it is neglected. A maximum conversion efficiency of 19.72% was obtained for a bromine ratio of x=0.56 in the case of neglecting the misfit strain, i.e. for an unconstrained structure, and of 19.30% at x=0.5 when it is taken into account. Detailed photovoltaic parameters have been presented and compared with those of similar works. The aim is to obtain more accurate performance results, by taking into account additional physical aspects likely to reveal improved results, always with a view to development.

Keywords: *Solar Cell, Perovskite, Lead-Free, Strain*

✉ *Corresponding Author Email : arbouzhayet@yahoo.fr*

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Abs. No: 378

Spectroscopy Investigation and Micro-Vickers Hardness Test of Nanostructured Iron-Aluminium Formed by a Non-Equilibrium Process

Zineb HAMLATI[1] ✉, Fadhéla OTMANE[1], Hanane MECHRI[2], Mohamed AZZAZ[2]
[1] Laboratoire des sciences aéronautiques (LSA), University of Blida 1, BP 270 Route de Soumaa, 09000, Blida, ALGERİA.
[2] LSGM, USTHB, BP 32, El-Alia, Bab Ezzouar, 16000, Algiers, ALGERIA.

ABSTRACT

Fe-Al alloys were prepared by high energy ball milling process. Mössbauer spectroscopy was used to investigate the structure and its correlation with micro hardness behavior as a function of milling time (1h, 8h, 12h, 24h and 32h). Mossbauer measurements allow us to observe the alloy formation at every stage of the mechanical alloying process. The spectrum obtained after 1 h of milling contains a magnetically split sextet with the hyperfine field Hhf = 33.1T and isomer shift IS = 0.00 mm/s, characteristic of the starting bcc Fe powder. The spectrum recorded after 32 h of milling reveals more advanced alloying. A significant decrease of the intensity of the bcc Fe sextet in favour of the intensity of the paramagnetic quadrupole doublet was observed at this stage. The doublet seen in the centre of the Mossbauer spectrum was attributed to the paramagnetic bcc Fe(Al) solid solution. The relative fraction of this paramagnetic component increased to about 64% and the isomer shift
IS = 0.21 mm/s.

Keywords: *Mössbauer spectroscopy, paramagnetic solid solution, Mechanical alloying.*

✉ *Corresponding Author Email : zhamlati@gmail.com*

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Abs. No: 380

Natural Radioactivity of oil sample in Southern Iraq

Ahmed Abdulkareem Abbood ALBUMEFREJ ✉, Iskender AKKURT
Suleyman Demirel University, Physics Department, Isparta-TURKEY

ABSTRACT

Recently attention has been devoted to the risks arising from naturally occurring radioactive materials (NORM) in oil fields and facilities. A large-scale survey was conducted in one of the most productive areas in the Halfaya oil fields of Maysan Governorate in southern Iraq. 30 soil samples were collected from ten different locations at depths of (30 cm, 40 cm, 50 cm). Activity concentrations were obtained for (Ra-226, Th-232 and K-40). The average radioactivity of Ra-226, Th-232 and K-40 was measured in the 10 selected sites using a scintillation detector (NaI (Tl)). In addition, the results obtained were compared with recommended international values and the results were within the normal permissible level.

Keywords: *Keywords 1, Keywords 2, Keywords 3*

✉ *Corresponding Author Email : ahmedabdulkareem220@gmail.com*

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Abs. No: 382

Shell-Model Study of the Spectroscopic Properties of the isobaric triplet 26Mg−26Al−26Si

Mouna BOUHELAL[1]✉, Abir SELIM[1], Florent HAAS[2]

[1] Echahid Cheikh Larbi Tebessi University, LPAT, Tebessa-ALGERIA

[2] IPHC, CNRS/IN2P3, Université de Strasbourg, F-67037 Strasbourg, Cedex2, FRANCE,

ABSTRACT

Rapid proton capture rp-process on Mg isotopes play an important role in the Mg-Al cycle active in stellar H-burning regions. In particular, low-energy nuclear resonances in the 25Mg(p,γ)26Al reaction affect the production of the radioactive 26Al nucleus. Furthermore, the 25Al(p,γ)26Si reaction is also important to constrain since it influences the abundance of the cosmic γ-ray emitter 26Al (T1/2 = 7.2×105 year) injected into the interstellar medium. Uncertainties in the 25Mg(p,γ)26Al and 25Al(p,γ)26Si reactions rates are dominated by the nuclear properties of low-lying proton-unbound states in 26Al and 26Si, respectively. The determination of the correct levels of 26Al and 26Si, based on the 26Mg and 26Si mirror states, is crucial to calculate the rp-process 25Mg(p,γ)26Al and 25Al(p,γ)26Si reactions rates. Theoretical spectroscopic properties: excitation energies, Jπ values, g-ray transition strengths, and proton partial widths have been performed, using the PSDPF interaction, for the mass A=26 system 26Mg−26Al−26Si. New shell-model analog assignments for T=1 triplet states in A=26 nuclei. Based on shell-model results and analog state information we present updated spectra for the A=26 system 26Mg−26Al−26Si. Detailed discussion of this study will be presented in our contribution.

Keywords: *sd-shell nuclei, nuclear structure, nuclear astrophysics*

✉ *Corresponding Author Email : m_bouhelal@yahoo.fr*

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Abs. No: 384

Review of the Current Status of Post-Covid Syndrome

Arslan SAY[1]✉, Taina AVRAMESCU[2], Daniela NEAGOE[3], Yanislav ZHELEV[4], Joanna KOMOREK[5]

[1]Amasya University, Amasya, TURKEY
[2]University of Craiova, Craiova, ROMANIA
[3]University of Medicine and Pharmacy of Craiova, Craiova, ROMANIA
[4]Free Burgas University, Burgas, BULGARIA
[5]College of Business and Health Sciences, Łódź, POLAND

ABSTRACT

Post-COVID syndromes, called Long-Covid, have emerged as a pathological formation affecting the physical conditions of individuals since the first days of the pandemic. In addition to persistent immunosuppression after the disease in individuals who have had Covid-19, medical and cognitive sequelae, including pulmonary, cardiac, vascular positivity's cause increased mortality and serious deterioration in quality of life. Although persistent symptoms and potential long-term effects are not taken seriously by patients, they are becoming increasingly important. This review is designed to present the mechanisms underlying persistent post-COVID syndrome and a strategy for the management of patients with persistent post-COVID syndrome.

Keywords: *COVID-19, Long-COVID, post-COVID symptoms, Sars-CoV-2*

✉ *Corresponding Author Email : arslan.say@amasya.edu.tr*

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Abs. No: 386

Monitoring poly(lactic acid)/trimilitic anhydride /polyethylene terephthalate fiber biocomposites water absorption and biodegradation in soil and compost mediums

Imane MAYOUF[1], Nadjat CHELGHOUM[2], Melia GUESSOUM[3]✉

[1] Department of Process Engineering - Faculty of Technology – Abdelhafid BOUSSOUF University Center of Mila, ALGERIA

[2] Department of Process Engineering - Faculty of Technology – BADJI Mokhtar University of Annaba, ALGERIA

[3] Laboratoire de Physico-Chimie des Hauts Polymères (LPCHP), Department of Process Engineering - Faculty of Technology, Ferhat ABBAS Sétif -1 University, ALGERIA

ABSTRACT

Poly(lactic acid) (PLA) is a linear aliphatic thermoplastic presenting a wide range of physical and mechanical properties, making it the more adequate replacement for commodity synthetic polymers in many applications including food and textile industries. However, PLA shows also some disadvantages that limit its use in some applications, thus restricting its utilization range. Indeed, PLA suffers from poor thermal stability, and inherent brittleness, which prevent its application in domains demanding high mechanical performances. In addition to water sensitivity, another PLA shortcoming is its limited gas barrier property, which precludes its suitable use as industrial packaging material. Also, compared to conventional polymers, PLA presents a relatively low melt strength, which is a critical limitation for its processing by thermoforming, blowing, and foaming. To remedy PLA deficiencies several strategies have been attempted such as blending with other polymers and adding reinforcements like fillers. Also, to improve PLA rheology, an increase of its molecular weight and its melt strength should enlarge its processing window. So, the use of chain extenders seems an adequate approach. Chain extenders have been developed to improve the melt strength and thermal stability as well as they act as good compatibilizers in polymer blends. Chain extenders allow an increase of the molecular weight by inter-connecting polymer chains and relinking the chain fragments, thus attenuating the effects of degradation reactions occurring during processing. In polycondensates, the chain extension is achieved by reacting the polymers end groups with bi- or multi-functional reactive moieties such as epoxy, diisocyanate, dianhydride, and diamine groups. In the case of PLA, a chain extender can generally react with terminal carboxyl and hydroxyl groups and it improves its processing performances when melt strength is crucial. In the present work, trimillitic anhydride (TMA) was tested as an efficient PLA chain extender, which aims to avoid thermal degradation and chain scissions during processing. Also, PET fibers (low density, high modulus and chemical resistance) were incorporated as a reinforcing agent to get lightweight PLA/PET fiber/TMA materials. The assessment of the composites environmental properties showed that the inclusion of TMA in PLA's chains accelerates its biodegradation in both soil and compost medium and that PLA/PET fiber/TMA composite is more favorable to water uptake than neat PLA and PLA/TMA samples.

Keywords: *Poly(lactic acid), Chain extender, Biodegradation, Water absorption*

✉ *Corresponding Author Email : guessoum_melia@yahoo.fr/ guessoum@univ-setif.dz*

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Abs. No: 391

Numerical investigation of the spray dynamic characteristics under Diesel combustion.

Feyçal LAKHFIF[1]✉, Zoubir NEMOUCHI[2]
[1] *University,de 20aout 1955 Skikda .Department of physic , Skikda-ALGERIA*
[2] *Département de génie mécanique, université de Constantine 1, Constantine- ALGERIA*

ABSTRACT
The spray combustion has a great influence on the emissions and power performance in diesel engines. This study investigated the spray combustion characteristics using the Eulerian–Lagrangian framework to model the spray A from Engine Combustion Network (ECN). The new approach considers the significant role that the surface viscous and internal circulation .The new approach considers the significant role that the surface viscous and internal circulation of a single droplet plays in the breakup and deformation of Diesel spray, the viscous interface is modeled to affect the droplet drag coefficient. The approach has been applied under non-reactive and reactive conditions, operating conditions. The numerical results show the spray length of liquid and vapor penetration, spray morphology, eddy turbulence, and lifts off flame length at the injection pressure of 150 MPa. A good agreement between both the numerical and experimental results has been found under Diesel condition. This model may be applied to extend the study to cover a wider range of spray applications..

Keywords: *spray, droplet , combustion , Diesel engine.*

✉ *Corresponding Author Email : f.lakhfif@univ-skikda.dz*

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Abs. No: 394

Evaluation of Radiotherapy Students' Knowledge Levels about Nuclear Medicine and Nuclear Energy

Mucize SARIHAN[1]✉, Işılay BİLGİÇ[2]
[1]Istanbul Okan University , Vocational School School Healt Services, Istanbul- TURKEY
[2]Istanbul Okan University , Vocational, Istanbul- TURKEY

ABSTRACT

Nuclear Medicine is the imaging process by administering radioactive material (oral, subcutaneous, inhaler, vascular access) to patients. It is frequently preferred in the field because it is non-invasive procedures and does not have an allergic effect. It is prepared by marking (mixing) organ-specific pharmacological drugs and Tc 99 m radioactivity and administered to the patient.

The aim of the research is to evaluate the knowledge levels of associate degree students enrolled in the radiotherapy program about nuclear medicine.

Qualitative research method was used in the research. A semi-structured open-ended survey was prepared and in-depth interview technique was applied. Criterion sampling, one of the purposeful sampling methods, was used to determine the participants. Qualitative data coding content analysis (calculation and mapping of code frequencies, themes and inter-category relationships) was carried out with the MAXQDA 2020 program for the data obtained after the interview.

As a result of the research, it has been revealed that there is a confusion of knowledge among students on some issues about radiation used in nuclear medicine departments. Students stated that the technicians working in this department are more affected by radiation and the risk of contamination is higher. In this section, it was determined that there were students who stated that radiation protection methods were less and had incomplete information. In this section, besides the students who stated that the dose would be at an acceptable level when the principles of radiation protection were applied, there were also students who were worried about working. In general, it has been determined that the knowledge level of the students about nuclear medicine is at a moderate level.

In the findings of the research, 7 main themes and sub-codes were determined. Main themes;

1. Radioactive contamination in nuclear medicine, 2. Radiopharmaceuticals and their properties, 3. Pet radiopharmaceuticals, 4. Medical exposure, 5. Diagnosis and treatment, 6. Ready-made radiopharmaceuticals, 7. Imaging techniques.

It is recommended that imaging technicians working on radiation in hospitals be included in the curriculum of Nuclear Medicine and radioactivity application procedures, which is a newer field of expertise compared to other departments. In addition to the nuclear medicine course given to students in health services, it is also recommended that students be given courses such as radiopharmaceuticals and working methods in the nuclear medicine laboratory (hot room)

Keywords: *Radiopharmaceuticals, Nuclear Medicine, Nuclear Energy*

✉ *Corresponding Author Email : mucizesarihan1997@hotmail.com*

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Abs. No: 395

Designing the Interior Structure of Tomography Imaging Rooms for Radiological Imaging

Berra Seda SARIHAN[1]✉, Mucize SARIHAN[2], Halil SOYAL[2], Işılay BİLGİÇ[1]
[1]*Istanbul Okan University , Vocational School, Istanbul- TURKEY*
[2]*Istanbul Okan University , Vocational School Healt Services, Istanbul- TURKEY*

ABSTRACT

In today's world, interior designs are evolving and diversifying. Particularly in applications aimed at diagnosis and treatment within hospitals, it is essential to carefully shield doors and walls to prevent the spread of radiation and contamination. The optimization of medical radiation usage is crucial for environmental protection and compliance with regulatory standards. By implementing appropriate safety measures, the need for safeguarding against the potential risks of radiation can be balanced with the benefits of radiation applications in various fields. Medical imaging and therapy technicians must adhere to radiation safety guidelines and best practices to protect themselves, their colleagues, and patients from unnecessary radiation exposure. Collaboration with radiation safety officers, radiation safety committees, and other relevant experts can contribute to the development of a safety culture and continuous improvement in radiation safety practices. The purpose of this study is to plan and enhance the interior design of tomography examination rooms providing radiological imaging to prevent contamination

Keywords: *Radiation Safety, Tomography, Interior design*

✉ *Corresponding Author Email : berrasedasarihan@gmail.com*

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Abs. No: 396

Radiation Workers In Hospitals And Managerial Ethics

Mucize SARIHAN[1]✉, Halil SOYAL[1], Işılay BİLGİÇ[2]
[1]Istanbul Okan University , Vocational School School Healt Services, Istanbul- TURKEY
[2]Istanbul Okan University , Vocational, Istanbul- TURKEY

ABSTRACT

Technicians have an important place among those working in hospital services. Radiology, radiotherapy and nuclear medicine technicians, especially those working in high-energy radiation fields such as gamma rays and x-rays, have some concerns about radiation safety. This situation brings with it some ethical problems in the work environment.

The purpose of this study; It is to examine and evaluate the ethical problems and solution suggestions of imaging technicians working in public hospitals, private hospitals and private imaging centers. The research method applied in the study is a qualitative research method. A semi-structured open-ended questionnaire was prepared and in-depth interview technique was applied. Criterion sampling, one of the purposeful sampling methods, was used to determine the participants. The data obtained after the interview was analyzed by qualitative data coding and content analysis (calculation and mapping of code frequencies, themes and inter-category relationships) with the MAXQDA 2020 program.

7 main themes and sub-codes were identified in the findings of the research. 7 main themes and sub-codes were identified in the findings of the research. These are Management ethics, Professional Ethical Responsibilities (health ethics), Institutional measures, Managerial Ethical Concerns, Written Rules, Other Ethical Issuesand Unethical Behavior of Radiation Workers

As a result, it is seen that the radiation safety and ethical perception of sector employees is high enough. There are two striking elements in these studies. The first of these is that healthcare sector employees report behavior they deem unethical within the sector directly to their superiors or to the competent authorities. Based on this, it is possible to think that the ethical perception of sector employees is high. Because health professionals who know the rules and are willing to implement them quickly, communicate the deficiencies they notice in ethical matters to their superiors, which shows that their sensitivity towards human health is extremely high.

The second factor is the attitudes of sector employees towards unethical events they see around them and in the sector. Accordingly, if there are unresolved ethical problems or if they see that bad conditions continue, sector employees are affected by this unethical situation and perform poorly. This situation is an indication of how much importance healthcare professionals attach to ethical issues and how inefficient they work in an unethical working environment.

Keywords: *Radiation Safety, Radiation Management, Ethics*

✉ *Corresponding Author Email : mucizesarihan1997@hotmail.com*

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Abs. No: 397

Effect of Kerosene -Methane Blends on Flame Temperature and Pollutant Emissions

Bilge ALBAYRAK ÇEPER[1]✉, Hüsamettin Alperen ALABAŞ[2]
[1]Erciyes University, Faculty of Aeronautics and Astronautics, Kayseri, TURKIYE,
[2]Cappadocia University, Vocational College, Nevsehir, TÜRKIYE,

ABSTRACT

The quest for cleaner and more sustainable alternative fuels is driven by increasing global temperatures and high energy demands.

In this study, an investigation into alternative fuels was carried out using the GTM-120, a miniature gas turbine engine. Initially, the findings were validated by comparing them to results from existing CFD and experimental studies in the literature, with a focus on combustion chamber outlet temperatures at three different engine speeds.

The impact of alternative fuel was assessed by introducing a 50% methane mixture into the combustion chamber within the confines of the verified simulation setup. A constant thermal power was maintained while calculating the methane mass flow rate. In the case of a 50% kerosene - 50% methane blend, changes in variables such as flame temperature and combustion chamber outlet temperature, along with the emission levels of pollutants like NOX and CO, were examined.

Significant results were obtained in our study. As expected, an increase in flame temperature was caused by the higher lower heating value of methane. Consequently, an increase in NOX emissions was observed, while CO emissions at the combustion chamber exit were substantially decreased.

Keywords:*Alternative fuels, Combustion, Emissions*

✉ *Corresponding Author Email : balbayrak@erciyes.edu.tr*

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Abs. No: 398

Investigation of the Quality of Life of People in Need with the Effect of Social Assistance and Solidarity Foundation

Nusret KARPUZ[1], Serdar ÖGEL[2]
[1]T. C. Ministry of Family, Labor and Social Services Social Assistance and Investigation Officer, TURKIYE,
[2]Afyon Kocatepe University Faculty of Economics and Administrative Sciences, Department of Business Administration, TURKIYE,

ABSTRACT

The aim of this study is to determine the impact of Afyonkarahisar İhsaniye Social Assistance and Solidarity Foundation on the quality of life of those in need.

While different approaches to the concepts of quality of life are presented in the study, the concept of poverty, types of poverty, causes and importance of poverty are examined in detail. In addition, the purpose of establishment, structure, duties, revenues and programs of the Social Assistance and Solidarity Foundation are also discussed in detail. In the research, 143 people were reached by simple random sampling method and data collection was carried out using the questionnaire technique. The data obtained were analyzed using the SPSS program.

According to the results of the study, it was found that the Social Assistance and Solidarity Foundation has positive effects on the quality of life of those in need. The findings of this study are expected to contribute to the development of SYD Foundation.

Keywords: *Life Quality, Poverty, Social Assistance and Solidarity Foundation.*

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Abs. No: 399

Evaluation of cyclic stress damage to the mechanism of rail steels on the curved lines, using the soldworks software.

Salim BELGHIT ✉, Omar ALLAOUI, Sami ZIDELMEL
Process Engineering Laboratory, Mechanical Department, Amar teldji University, Laghouat-ALGERİA

ABSTRACT

Rail transport systems are very important for the future to reduce fuel consumption and provide sustainable solutions to reduce carbon emissions. They enable more mobility with better energy efficiency, and they produce long-term cost-effective benefits. However, it should be noted that the cyclic force between the wheel and the rail on the curve line always cause problems and difficulties during the operation of the rails.

Maintaining rail transport systems is a priority by following a preventive maintenance program. Planning a preventive maintenance intervention requires good fault diagnosis.

Our study consists in modeling the fatigue effect on a simultaneous inner and outer rail section by the finite element method using solidworks software according to our analysis results. The traces of fatigue appearing on the inner rail are less significant compared to the outer rail. Accurate prediction of rail profile fatigue evolution to improve safety and reduce preventive maintenance costs.

Keywords: *Railway , Wheel-rail contact, Impact force, Fatigue, Solidworks.*

✉ *Corresponding Author Email : belghit_salim@yahoo.fr*

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Abs. No: 400

A Qualitative Study on the Effect of Behavioral Sciences Course on University Students' Thoughts, Attitudes and Behaviors

Nurdan KARPUZ ✉
Amasya University, Sabuncuoğlu Şerefeddin Vocational School of Health Services, Department of Medical Services and Techniques, Amasya, TURKEY

ABSTRACT

Individuals' personality traits, beliefs, characters, abilities and behaviors are linked to the belief and value judgment systems of the societies they live in. Value judgments determine which human behaviors are good and which are right and useful. Value judgment is an important criterion in the evaluation of human behavior. While behavior is defined as a reaction to a stimulus, behavioral sciences is an interdisciplinary science that examines the motives and thoughts that lead people to behave in the face of events, as well as the causes and consequences of their behavior. In university life, students have many duties and responsibilities. One of these responsibilities is to shape their thoughts, attitudes and behaviors with the value judgments offered by society. In this context, it was aimed to evaluate the variations in the thoughts, attitudes and behaviors of university students after the "behavioral sciences" course taken in the first semester of the first year (fall semester). The study group of the research consisted of the students who continued their education at Amasya University Sabuncuoğlu Şerefeddin Vocational School of Health Services and took the behavioral sciences course. Qualitative research method was used in the study and data were collected through semi-structured interview questions created by the researcher. The results were discussed within the framework of the literature.

Keywords: *Human behavior, University students*

✉ *Corresponding Author Email : nurdankarpuz@amasya.edu.tr*

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Abs. No: 401

Study of the Determination of the Technical Parameters of Centrifugal Pumps

Zina AZEZ✉, Lamia BENZAID
20 August 1955 University, Dept. of Mechanical Engineering, 21000, Skikda, ALGERIA

ABSTRACT

A pump is a device for sucking and to discharge a fluid. The liquid that enters through its suction or feeding flange with a certain energy level comes out with a higher level pupil. Without going into details, the pumps can be classified into four main families according to their mode of communication and their energies, volumetric, centrifugal and axial.

Many so-called roto-dynamic pumps combine centrifugal and axial effects; it is helico-centrifugal or simply mixed.

The objective of this work is to vary the parameters techniques for calculating the rotational speeds of centrifugal pumps depending on the volume flow which are ; 2400 rpm and 2800 rpm. The results obtained are visualized graphically in the form curves. Subsequently, the curves obtained are modeled by a monogram.

Keywords: *Technical parameters, centrifugal pumps.*

✉ *Corresponding Author Email : azezzina21@yahoo.com*

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Abs. No: 404

Mathematical Programming Formulations for Network Improvement Problems

Esra KOCA✉
Sabanci University, Industrial Engineering Program, Istanbul-TURKEY

ABSTRACT

In this study, we investigate network improvement problems where we relax the assumption of fixed edge traversal times that are typically associated with the traditional network flow problems. We address two distinct versions of the problem. In the 'edge improvement problem', we make enhancement decisions for specific edges within the graph, while in the 'node improvement problem', we focus on improving individual nodes. It's worth noting that in the former, only the traversal times of the improved edges decrease, whereas in the latter, the traversal times of all edges connected to the enhanced nodes decrease. While computational complexity results and approximation algorithms exist in the literature for special cases of these problem types, to the best of our knowledge, mathematical programming formulations for these problems have not been explored in the literature before. In this study, we provide mixed-integer programming formulations for both variations of the problem, considering different assumptions related to the improvement decisions. In our mathematical models, we minimize the total weighted travel time in the network under a budget constraint for the improvement decisions. We evaluate these formulations by comparing them using an off-the- shelf solver in an extensive computational study.

Keywords: *Network improvement problems, network flow problems, mixed-integer programming*

✉ *Corresponding Author Email : esra.koca@sabanciuniv.edu*

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Radiation Protection Efficiency of 10Bi2O3-10Nb2O5-80TeO2 Glasses

Yusuf CEYLAN✉
Selçuk University, Physics Department, Konya-TURKEY

ABSTRACT

As the eadiation is important phenomen protection from its hazardous effect becomes important. One of the important parameter is radiation Protection Efficiency (RPE) and it will give idea abour shielding properties. In this paper Protection Efficiency (RPE) of 10Bi2O3- 10Nb2O5-80TeO2 Glass has been obtained.

Keywords: *Radiation shielding, RPE, Glass*

✉ *Corresponding Author Email : yceylan@selcuk.edu.tr*

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Mean free path of glass samples in terms of radiation shielding

Yusuf CEYLAN✉
Selçuk University, Physics Department, Konya-TURKEY

ABSTRACT

Mean free path (mfp) is defined as the avreage distance of radiation which can travel in a medium. Thus this parameter can be used to express radiation shielding capasity of any materials. In this paper mean free path (mfp) obtained in this purposes for some glass samples.

Keywords: *Radiation shielding, Glass, mfp*

✉ *Corresponding Author Email : yceylan@selcuk.edu.tr*

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Effective Atomic Number and Electron density for some glass to test shielding properties

Yusuf CEYLAN✉
Selçuk University, Physics Department, Konya-TURKEY

ABSTRACT

Effective Atomic Number (Zeff), Effective electron density (Neff) are one of the basic parameters for radiation shielding and in this paper Effective Atomic Number (Zeff) and effective electron density results will be discussed to test radiation shielding properties of some glass samples.

Keywords: *Radiation shielding, Glass, Zeff ,Neff*

✉ *Corresponding Author Email : yceylan@selcuk.edu.tr*

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The Effect Of Ms Modulus And Curing Temperature On Workability And Strength In Geopolymer Mortars

Hüsamettin URUNVEREN[1]✉, Ahmet BEYCIOGLU[1], Emriye Çınar RESULOGULLARI[2]

[1] Adana Alparslan Türkeş Science and Technology University, Faculty of Engineering, Department of Civil Engineering, 01410, Sarıçam/Adana-TURKEY

[2]Osmaniye Korkut Ata University, Faculty of Engineering, Department of Civil Engineering, 08000, Merkez/Osmaniye-TURKEY

ABSTRACT

This study evaluated the effect of MS modulus and curing temperature on workability and strength of geopolymer mortars. To determine the optimum thermal cure temperature in the first stage, a 50x50x50 mm mixture with fixed MS and Na2 O % were cured in an oven at 45, 60, 80, 90, 100, and 120 °C for 24 hours, and uniaxial compressive strength test was applied. Then, the workability of geopolymer mortars was evaluated by preparing 12 different MS modulus and 36 different mixtures with 3 different % Na2O in each MS module. Workable mortars were cured for 24 hours at a temperature (of 100°C), which gave the best strength result in the preliminary test. 32 mortar samples with 2 different curing times, 4 different curing temperatures, and 4 different mixtures were cured in 3 repetitions and their compressive strengths were examined. As a result, between MS module and workability and strength; With the increase in MS modulus and Na2O concentration, improvements in workability were observed. It was determined that the main factor affecting the flow diameter in geopolymer mortars was the Na2O concentration in the activator solution. Regardless of the MS modulus, the compressive strengths of all samples increased up to 100°C and decreased after that point. In addition, a continuous decrease in MS modules was observed regardless of temperature.

Keywords: *Geopolymer, mortar, silicate modulus, oven curing, flowability, compressive strength*

✉ *Corresponding Author Email : hurunveren@atu.edu.tr*

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Abs. No: 410

Determination Of Radon Activity Levels Of Tap And Spring Water In The Anatolian Side Of Istanbul

Feride KULALI ÖZDEK✉, Yuşa GÜRSOY
Üsküdar University, TURKEY

ABSTRACT

Radon gas, the biggest source of natural radiation exposure, is easily soluble in water. Therefore, water used in households and spring water used as drinking water can be radioactive at various levels. In addition, radon in water entering homes can be inhaled when it is released into the air and can increase the risk of lung cancer. Regular monitoring ensures that these levels are within the safe limits. Measuring and monitoring radon in water is vital for protecting public health, ensuring access to safe drinking water and guiding policies and regulations to reduce radon-related health risks. In this study, dissolved radon activity concentrations were measured using AlphaGUARD PQ2000Pro in samples taken from districts on the Anatolian side of Istanbul.

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Cobalt Sulfide thin film: Preparation, Properties and Application in Photo- electrochemical Catalysis for CO2 conversion

Sabiha ANAS BOUSSAA[1]✉, Lamia TALBI[1], Karima BENFADEL[1], Yahia OUADAH[1], Assia BOUKEZZATA[1], Djaouida ALLAM[2], Smain HOCINE[2], Ouahiba BOUCHELAGHEM[3], Amar MANSERI[1], Samira KACI[1]

[1] Research Center On Semiconductor Technology for Energetic, CMSI-CRTSE, 2 BD Frantz Fanon, 7 merveilles, POB 140, Algiers, ALGERIA

[2] University Mouloud Mammeri of Tizi Ouzou, Laboratory of Applied Chemistry and Chemical Engineering, Sciences Faculty, LCAGC-UMMTO, Tizi Ouzou, ALGERIA

[3] Research Center On Semiconductor Technology for Energetic, CCPM-CRTSE, 2 BD Frantz Fanon, 7 merveilles, POB 140, Algiers, ALGERIA

ABSTRACT

Due to their great properties and specific structures, transition metal sulfides play an imperative role within the improvement of productive and steady photo-electrochemical catalysts.

As one of the more used metal sulfide catalyst, cobalt sulfide is highly interesting due to its good stability, suitable band structure, high conductivity.

Therefore, in the present work, cobalt sulfide thin films were successfully deposited on glass and silicon substrate using a simple and efficient method.

The as deposited film was characterized using several characterization techniques.

The morphological, optical and electrochemical properties were determined and according to the findings, these layers can be applied in various applications such as water splitting and CO2 conversion.

Keywords: *CoxSy, Thin films , Photoelectrochemical, Photocathode , CO2 conversion*

✉ *Corresponding Author Email : sabiha.anas@gmail.com anassabiha@crtse.dz*

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Meşe Ağacı Talaşı Dolgulu Polyester Kompozitlerin Mekanik Özelliklerinin İncelenmesi

İlyas KARTAL[1]✉, Mehmet TUNÇ[2]
[1] *Marmara Üniversitesi, Teknoloji Fakültesi, Metalurji ve Malzeme Mühendisliği, İstanbul-TÜRKİYE*
[2] *Marmara Üniversitesi, Fen Bilimleri Enstitüsü, Metal Eğitimi Ana Bilim Dalı, İstanbul-TÜRKİYE*

ABSTRACT

Yeşil kompozitler, bir polimer matrisinin doğal elyaflarla takviye edildiği belirli bir sınıf kompozitlerdir. Biyolojik olarak parçalanabilir, yenilebilir kaynaklardan elde edilen yeşil kompozitler, geleneksel sentetik plastiklerden kaynaklanan çevresel problemlere ve fosil kaynaklarına alternatifler bulması sebepleriyle büyük ilgi görmekte ve birçok endüstriyel uygulamada kullanılabilmektedirler

Yeşil kompozitlerden üretilmiş ürünler yoğun olarak, otomotiv, mobilya, inşaat ve ambalaj sektöründe kullanılmaktadır. Geri dönüştürülebilir yeşil kompozit ürünlerin üretiminde Lif ve dolgu malzemeleri olarak selüloz, fındık kabuğu, bambu lifi, buğday sapı, ceviz kabuğu, Antep fıstığı kabuğu gibi doğal malzemeler yoğun olarak tercih edilmektedir.

Bu çalışmada, ülkemizde yoğun olarak bulunan meşe ağacı talaşı doğal dolgu malzemesi olarak kullanıldı. Matris malzemesi olarak ise kompozit endüstrisinde en çok kullanılan matris malzemesi polyester reçinesi kullanıldı. Böylece çevreye duyarlı bir yeşil kompozit üretimi hedeflenmiştir. Ağaç talaşı farklı oranlarda polyestere ilave edilerek kompozit malzemeler elde edilecektir. Öncelikle talaş, elekler kullanılarak belli boyutlara getirilecektir. Açık döküm yöntemi ile polyestere %5 oranında başlayarak (% 5, 10, 15, 20, 25, 30, 40 ve 50) doyuma ulaştığı orana kadar devam edecek ve her bir boyuttan ayrı ayrı kompozit numuneler hazırlanacaktır.

Farklı oranlarda kullanılan dolgu malzemelerinin polimerle olan en uygun katkı oranı belirlenecek ve kompozitin çekme, eğilme, darbe, sertlik gibi mekanik özellikleri üzerinde etkisi incelenecektir. Matris malzemesi olarak endüstride yoğun kullanımı olması sebebiyle genel amaçlı polyester kullanılacaktır. Kompozit numunelerin kırık yüzey görüntüsü incelemesi de yapılacaktır.

Bu çalışmayla ahşap talaşı kullanımıyla kompozit üretim maliyetinin düşürülmesi, sentetik dolgu üretiminin azaltılması, maliyetin düşürülmesi, gaz emisyonunun azaltılması, doğal kaynakların korunması sağlanacaktır.

Keywords: *Meşe ağacı talaşı, doymamış polyester, kompozit malzeme, mekanik özellikler*

✉ *Corresponding Author Email : ilyaskartal@marmara.edu.tr*

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Abs. No: 414

Radiation Shielding Properties of Titanium Carbide Added 7075 Aluminum Alloy

İskender AKKURT[1], Kadir GÜNOĞLU[2]✉, Hatice VAROL ÖZKAVAK[2],
[1] Suleyman Demirel University, Science Faculty, Physics Department, Isparta-TURKEY
[2] Isparta University of Applied Sciences, Technical Vocational School, Isparta- TURKEY

ABSTRACT
Radiation is used in many different areas, but since it harms living organisms, it must be kept within acceptable limits. The most specific method for this is shielding. Many researchers are trying to produce shielding materials that can be an alternative to lead used in shielding gamma radiation. In this study, the effect of TiC doping on AA7075 aluminum alloy on radiation shielding properties was investigated. For this purpose, the mass attenuation coefficient was calculated using the XCOM database. The results obtained for doped and undoped aluminum alloy were compared.

Keywords: *radiation shielding, AA7075 aluminum alloy, TiC, XCOM database*

✉ *Corresponding Author Email : kadirgunoglu@gmail.com*

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Abs. No: 415

Investigation of photon interactions of some low alloy steels

İskender AKKURT[1], Hatice VAROL ÖZKAVAK[2], Kadir GÜNOĞLU[2]
[1] Suleyman Demirel University, Science Faculty, Physics Department, Isparta-TURKEY
[2] Isparta University of Applied Sciences, Technical Vocational School, Isparta- TURKEY

ABSTRACT

The absorption, energy loss or scattering of gamma rays interacting with the material depends on the atomic number and density of the material. Although the atomic numbers of elements are known, we cannot talk about an exact value for chemical compounds and alloys. In particular, gamma rays that interact with the material have 3 basic interaction mechanisms depending on their energy. These mechanisms are Compton scattering, Photoelectric Effect and Pair Formation. In this study, the interaction mechanisms of some low alloy steels were examined. Interactions of gamma rays with steels were determined theoretically using the web version of the XCOM photon section database.

***Keywords**: low alloy steels, photon interaction, XCOM*

✉ *Corresponding Author Email : kadirgunoglu@gmail.com*

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Abs. No: 416

Determination of continuous deceleration approach range and stopping power of some polymer materials

Kadir GÜNOĞLU[1], İskender AKKURT[2],
[1] *Isparta University of Applied Sciences, Technical Vocational School, Isparta- TURKEY*
[2] *Suleyman Demirel University, Science Faculty, Physics Department, Isparta-TURKEY*

ABSTRACT

Polymers are among the most important materials in our daily lives. They can be used as casings, tapes, toys, sheets, and pipes, among other things. Most of these everyday items are made of plastics, such as polyethylene (PE), polypropylene (PP), polyvinyl chloride (PVC), and others. In industry, they are used as insulators, adhesives, and other materials. Polymers have a straightforward production process and a wide range of desired properties at room temperature. At higher temperatures, they become extremely malleable and can be easily molded into a wide range of shapes. They are stiff, brittle, solid things at room temperature. Polymers' beneficial properties have led to a wide range of applications for them in the modern world. Accurate knowledge of the stopping power of different media for charged particles is often important in radiation physics, chemistry, biology, and medicine. Stopping power is the average energy lost by charged particles along their tracks. The collision stopping power and the radiative stopping power are the two main components that make up the total stopping power of electrons and positrons. The aim of this study is to calculate the stopping power and CSDA range of incident electrons in the 20 eV–1 GeV energy range of different types of polymer materials.

Keywords: *Electron stopping power, CSDA range, Polymers*

✉ *Corresponding Author Email : kadirgunoglu@gmail.com*

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Abs. No: 417

Gamma radiation attenuation coefficients of polyester materials containing basalt powder

İskender AKKURT[1], Kadir GÜNOĞLU[2]
[1] Suleyman Demirel University, Science Faculty, Physics Department, Isparta-TURKEY
[2] Isparta University of Applied Sciences, Technical Vocational School, Isparta- TURKEY

ABSTRACT

The increasing use of radiation in many application areas has made it necessary to conduct efficient research on radiation protection against its harmful effects. The idea of utilizing a shielding material to reduce and/or hold various types of radiation is the foundation of the great majority of studies on radiation protection. Because of their superior mechanical and physical qualities as well as their ease of forming composite materials with various additives, polymer-based materials are becoming more and more used for this purpose. In this study, gamma radiation attenuation coefficients of polyester materials containing different amounts of basalt powder were obtained by theoretical methods. The attenuation coefficients of the samples were calculated theoretically using Phy-X/PSD software.

Keywords: *polyester, basalt powder, radiation attenuation coefficient*

✉ *Corresponding Author Email : kadirgunoglu@gmail.com*

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Abs. No: 418

Calculation of Mean Free Path for CuO-ZnO Based Ceramic Composites

İskender AKKURT[1], Kadir GÜNOĞLU[2]
[1] *Suleyman Demirel University, Science Faculty, Physics Department, Isparta-TURKEY*
[2] *Isparta University of Applied Sciences, Technical Vocational School, Isparta- TURKEY*

ABSTRACT

In order to create new materials with improved mechanical, electrical, and physical properties, two or more chosen materials are blended to create composite materials. This process is known as blending. Ceramic Matrix Composites (CMCs) are one type of composite material. CMCs are divided into two stages. One stage serves as a matrix, and the other as reinforcement. Because of their more stable dimensions than those of metals, CMCs are an alternative material that has a wide range of applications. High mechanical strength, high corrosion resistance at high temperatures, high toughness, and high thermal stability are typical characteristics of CMCs. Radiation can travel an average distance through a medium, which is known as the mean free path (mfp). Therefore, any material's radiation shielding capacity can be expressed using this parameter. In this study, the mean free path values of CuO-ZnO based ceramic composites were calculated using the linear attenuation coefficient.

Keywords: *Ceramic Matrix Composites, mean free path, linear attenuation coefficient*

✉ *Corresponding Author Email : kadirgunoglu@gmail.com*

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Calculation of mass attenuation coefficients of Molybdenum-Alumina Composites

İskender AKKURT[1], Kadir GÜNOĞLU[2]
[1] *Suleyman Demirel University, Science Faculty, Physics Department, Isparta-TURKEY*
[2] *Isparta University of Applied Sciences, Technical Vocational School, Isparta- TURKEY*

ABSTRACT

The design and manufacturing of ceramic-metal composites, which are highly processed materials, are intended to produce certain physicochemical characteristics that will enable their stable and dependable operation under demanding, occasionally severe, exploitation conditions. These materials have an advantage over traditional ceramic materials in that they are more fracture tough. This parameter is dependent on several factors, such as the kind, quantity, size, and shape of metallic phase particles, as well as the homogeneity of their dispersion within the composite matrix. The most common materials used to alter the characteristics of alumina ceramics are tungsten, copper, nickel, chromium, and molybdenum. In this study, the mass attenuation coefficients of composites containing different ratios of Molybdenum and Aluminum were calculated theoretically using Phy-X/PSD software.

Keywords: *Molybdenum-Alumina Composites, mass attenuation coefficient, Phy-X/PSD software*

✉ *Corresponding Author Email : kadirgunoglu@gmail.com*

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