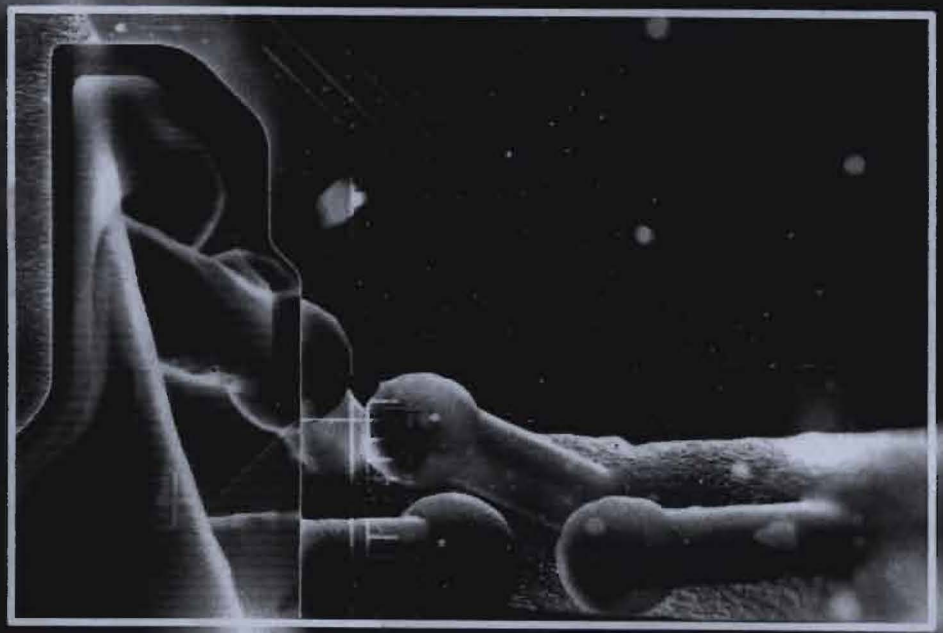
Bio-CAM 2017

CONFERENCE ON BIOMEDICAL & ADVANCED MATERIALS



Programme & Abstract

LANGKAWI | 28th TO 29th

BAYVIEW HOTEL | NOVEMBER 2017

FOREWORD

Economic sustainability is a powerful way to generate innovative technology solutions in producing creativity through presenting new problems to solve and establishing big goals that drives people to think differently and fostering competitiveness. It is also one of the main drivers for technology disruption today, as the nations are progressively dealing with environmental and social issues, water and air pollution, climate change, a growing and aging population and the increasing needs by an affluent middle class social strata,

Standing on a brink of technological revolution that will eventually be altering the way we live, work and relate to each other, the Fourth Industrial Revolution is a concept that see through the technological changes of digital, connectivity, robotics and big data. This disruptive revolution will transform most of our business models and daily activities. In this advanced economy situation, every business sector will have to deal with technology evolving at high speed and they will have to decide whether these changes can be maximized to push innovation. The big question is on whether the Fourth Industrial Revolution will drive the global economies or will the more connected and automated world threaten jobs and business.

Picturing the current global scenario, on behalf of Industrial Innovation in Biomedical, it gives me a great pleasure to extend a warm welcome to all presenters and participants to the Conference on Biomedical and Advanced Materials (Bio-CAM) 2017. With the theme of "Unleashing Innovative Technology Solutions in Driving the Nations' Economic Sustainability", Bio-CAM aimed to represent the leading edge insights and scholarly discussions related to various innovative technology advancement that may have a high impact on the economy of the future. Conference participants will have the opportunity to listen to the ideas presented by speakers not only from local research institutions and universities but also from our foreign counterparts, namely Indonesia, Philippines, South Korea, Thailand, Pakistan and Bangladesh.

I would also like to thank all our sponsors and we really appreciate your support for Bio-CAM 2017. Last but not least, Bio-CAM 2017 would not have been possible without the strong commitment of the organizing committee. I thank all, for your hard work and dedication towards making Bio-CAM 2017, a success. To all, *Selamat Datang* and wish you have an enjoyable conference.

Dr Kartini Noorsal

Director,
IC-Innovation in Biomedical, SIR,
SIRIM BERHAD

Bio-CAM 2017

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... Complex, SIRIM Berhad
... Hi-Tech 2/3, Kulim Hi-Tech Park
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Editorial

Assalamualaikum.... and warmest greetings to all,

It is a privilege to welcome all the participants to the Conference on biomedical and Advanced Materials (Bio-CAM) 2017.

This conference will highlight on research topic that cover various areas of biomedical and advanced materials. It is inspired to provide a meaningful discussion platform for professionals, researchers, scientists, engineers, industrials and students to meet and share their contributions in their latest research findings and future works. In two days programme, At this Bio-CAM 2107, you will not only be able to get yourself acquainted with the latest ideas as a researcher but share experiences from local and international speakers.

I would like to express my gratitude to the Organizing Committee for their commitment and hard work in making this conference a success. The committee members demonstrated professionalism and true dedication that produced an exceptional technical programme. I also wish to extend my heartfelt appreciation to all of our exhibitors and sponsors for their generous support and contribution.

Representing the Organizing Committee of Bio-CAM 2017, we welcome all of you and we hope that you will have a pleasant conference. Thank you for your participation and support.

Thank you.

"Unleashing Innovative Technology Solutions in Driving the Nations' Economic Sustainability"

Dr Mohd Afinn Omar
Chairman
Bio-CAM 2017

Plenary Speakers' BIOGRAPHY

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Prof. Ir. Dr. Ahmad Fadzil Mohamad Hani, who was previously the Deputy Vice-Chancellor (Research & Innovation) at Petronas University of Technology (UTP), was appointed as the new President & Chief Executive of SIRIM Group for a period of three years with effect from 1 April 2017.

He started his academic career with Universiti Sains Malaysia in 1984 and later joined Universiti Teknologi Petronas (UTP) in 1997. In UTP, he was a Senior Professor at the Department of Electrical and Electronics Engineering; the Deputy Vice-Chancellor (Research & Innovation) and a member of the University Senate and the University Management Committee.

He was also the Director of the Centre for Intelligent Signal & Imaging Research, a research centre he founded in 2008 that has been accorded a Higher Institution Centre of Excellence status by the Ministry of Higher Education Malaysia in 2014. He was appointed as General Manager in Frontier Technology at the PETRONAS Research (2008-2010) and successfully secured funding of RM40M from the Petroleum Research Fund to establish R&D on renewable (biomass and solar) technologies.

Prof Ir. Dr Ahmad Fadzil Mohamad Hani, FASc, FIEM
SIRIM BERHAD
President & Group Chief Executive

Prof. Ahmad Fadzil is an expert in the area of image processing and computer vision. His research activities range from fundamental pattern recognition to developing vision and imaging applications in the biomedical area such as surface imaging leading to objective assessment for treatment efficacy of ulcer wounds and psoriasis lesions, optical imaging of retinal vasculature imaging for grading severity of diabetic retinopathy and skin for pigmentation analysis.

Prof Dato' Dr Zainal Ariff Abdul Rahman
UNIVERSITY OF MALAYA
Dean/Senior Consultant Oral & Maxillofacial Surgeon, Faculty of Dentistry

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Prof Dato' Dr Zainal Ariff Abdul Rahman is a professor, Senior Consultant Maxillofacial Surgeon at University of Malaya Medical Centre (UMMC) and the Dean of Dental Faculty, University of Malaya. He is also the Managing Director of the Centre for Biomedical Technology and Innovation (CBMTI) Sdn. Bhd. He obtained his first degree in Bachelor of Dental Surgery (BDS) in 1987 from University of Dhaka before pursuing Master of Science degree (MSc) in Oral Surgery at London University in 1993.

He held various positions in many influential professional bodies. Formerly, he was the Regional Adviser for Faculty of Dental Surgery Royal College of Surgeons of England and President of Malaysian Association of Oral and Maxillofacial Surgeons. Currently, he is the Councillor of International Association of Oral and Maxillofacial Surgeons and a life member of Eastman Academy International Chapter. Prof Dato' Dr Zainal Ariff is also one of the assessors for Malaysian Qualification Agency (MQA) and reviewer for Oral Disease (ISI cited Journal). In terms of publications, he has to his credit more than 70 articles published in refereed journals. His research and clinical interest includes oral cancer, 3D printing, craniofacial deformity and vascular lesions.

He has received many awards for his outstanding contributions including from MOSTI for "Saintis Cemerlang" Award, Gold Medal Geneva in 2005 and four National Gold Medal Awards. In 2012, he received a prestigious royal award Dato' Paduka from Sultan of Kelantan State.

LIST OF ORAL PRESENTERS

REFERENCE NO	TITLE	INSTITUTION
Bio-CAM2017: 002-001	Exploiting Enviromental Friendly Binder System for Net Shaped Forming of 316L Stainless Steel Implants norainiwahabitm@yahoo.com	UiTM
Bio-CAM2017: 009-003	Facile Synthesis of Ag/MoS_2 Nanocomposites for Photocatalytic Activity taqi_wardi@yahoo.com	UKM
Bio-CAM2017: 011-004	Thermal Properties of Carboxymethyl Cellulose (CMC) Filled Halloysite Nanotube (HNT) Bio-Nanocomposite Films kathiravansupplah@gmail.com	UniMAP
Bio-CAM2017: 017-006	Densification Behavior and Mechanical Properties of Cerium Oxide and Manganese Oxide-Doped Yttria Tetragonal Zirconia Polycrystals Ceramics for Dental Applications sankarsaisanjay@gmail.com	UNITEN
Bio-CAM2017: 018-007	Effect of CeO2 and MnO2 on the Microstructure, Degradability and Mechanical Properties of Zirconia dineshragurajan@gmail.com	UNITEN
Bio-CAM2017: 010-008	Comparison Of Gd2O2S:Eu3+ Nanophosphors Luminescent Properties Prepared By Microwave And Γ-Irradiation Methods sapizah@gmail.com	UKM
Bio-CAM2017: 021-009	Sustainable Synthesis of Metal Oxide Nanoparticles from Locally Isolated Aquatic Bacteria pjayshree7@yahoo.com	UPM
Bio-CAM2017: 022-010	Microwave Activation of Sol-Gel Spin Coated Magnesium Doped Gallium Nitride Thin Films shashiong@yahoo.com	USM
Bio-CAM2017: 004-011	Influence of Ni-Ti ratio on the Reversible Austenite Martensite Transformation and Material Characterization of Pseudo-elastic Shape Memory Alloy bellahamid167@gmail.com	UiTM
Bio-CAM2017: 007-012	Gamma-Irradiation Method to Synthesis and Characterization Properties of Gd2O2S:Pr3+ Nanophosphors kirinhasim@gmail.com	UKM
Bio-CAM2017: 031-014	Evaluation of Contrast-Noise Ratio (CNR) In Contrast Enhanced CT Images Using Different Sizes of Gold Nanoparticles zakyharun@usm.my	USM
Bio-CAM2017: 024-016	Mechanical Properties of Polytetrafluoroethylene (PTFE) Powder Reinforced Bio-Based Palm Oil Polyurethane (POPU) Composite Foam hazmi1805@gmail.com	UniMAP
Bio-CAM2017: 039-17	Physico-chemical Properties of the Biodegradable Films of Poly(Vinyl Alcohol)/ Sago Starch for Food Packaging fadzehah@gmail.com	UiTM
Bio-CAM2017: 038-018	Screening of Vernonia Amygdalina Leaf Extracts for Antioxidant and Antimicrobial Activity ketharin@mahsa.edu.my	MAHSA University
Bio-CAM2017: 014-019	Rapid Fabrication and Characterisation of PDMS Microfluidics Device Using Printed Polymeric Ink azmanaziz@unikl.edu.my	UniKL BMI
Bio-CAM2017: 023-020	Use of Bacteriostatic Antibiotics for The Optimization of New Media In View Of Supplementing Palm Oil Mill Effluent (POME) As An Alternative Carbon Source For Polyhydroxyalkanoates (PHA) Production - A Statistical Approach paulraj@mahsa.edu.my	MAHSA University
Bio-CAM2017: 044-021	Effect of AC-Anodizing Parameter on AZ80 in Alkaline Solution suhaily93@gmail.com	UniMAP
Bio-CAM2017: 013-027	Electrochemical Studies for Comparison of Selected Screen Printed Electrode in Redox Solutions suhailisabdin@gmail.com	UniKL BMI
Bio-CAM2017: 053-028	Carboxymethyl Cellulose Nanofibers Impregnated With Silver Nanoparticles For Tissue Engineering Applications farahhanani@ump.edu.my	UMP
Bio-CAM2017: 012-029	PEG Coated Bismuth Oxide Nanorods Induced Radiosensitization On MCF-7 Breast Cancer Under Irradiation Of Megavoltage Radiotherapy Beams safri@usm.my	USM
Bio-CAM2017: 055-031	Effect of Plasma-forming gas in the Radio-frequency Plasma Reduction of Silver Ions Impregnated into a Natural Zeolite Framework aosonio2012@gmail.com	University of the Philippines Diliman
Bio-CAM2017: 054-032	H-Y zeolite as hydrodeoxygenation catalyst for the diesel production from rubber seed oil mariam_g02883@utp.edi.my	UTP
Bio-CAM2017: 056-033	Material Failure Investigation Of A Cracked Disc Brake Of A Provincial Bus Through Metallography eleanor.olegario@gmail.com	University of the Philippines, Diliman

REFERENCE NO	TITLE	INSTI
Bio-CAM2017: 052-034	Effect Of Reduction Temperature Of Reduced Graphene Oxide (Rgo) On Morphological, Optical And Electrical Properties erdajaafar91@gmail.com	U
Bio-CAM2017: 033-035	Physico-Chemical Properties of SAPO-34 impregnated ZnO as Bifunctional Heterogeneous Catalyst abubakar_g03619@utp.edu.my	
Bio-CAM2017: 006-036	An Analysis of Full Weld Cycle Heat Distribution of Friction Stir Welding on Pipe Butt Joint azman@unikl.edu.my	U
Bio-CAM2017: 056-037	Potential Biomedical Application Of Ag-Exchanged Bentonite eleanor.olegario@gmail.com	University o
Bio-CAM2017: 057-038	Investigating the Effect of Surface-functionalized Mesostructured Silica on the Rheological Properties of EOR Surfactant for Application in HTHP Oil Reservoir mohammed_g03411@utp.edu.my	
Bio-CAM2017: 059-039	Properties Of Cnt-Gnr Junction Through Dft Simulation ahmed.eee@uap-bd.edu	Universit
Bio-CAM2017: 037-040	Comparison optimization of radiation-induced grafting of sorbic acid onto LDPE syaween@gmail.com	Malaysian
Bio-CAM2017: 067-043	Structural and Optical Properties of Graphene and Reduced Graphene Oxide maahmad@ciitlahore.edu.pk	COMSAT Inform
Bio-CAM2017: 068-046	Effect of unmodified and modified silica particles on morphology and performance of mixed matrix membrane (MMM) mannan1403@gmail.com	
Bio-CAM2017: 075-049	Polymer Light Emitting Diodes (PLEDs): An Update Review on Current Innovation and Performance of Material Properties joo_17005326@utp.edu.my	
Bio-CAM2017: 045-050	Stress Interaction between Implant Thread and Trabecular Bone in Fracture Healing nooralia89@gmail.com	U
Bio-CAM2017: 074-051	Detection of Aedes Aegypti Larvae Frequency Range using Signal Processing Method aqil.inodea@gmail.com	
Bio-CAM2017: 076-052	Human Motion Analysis in Dark Surrounding Using Line Skeleton Scalable Model and Vector Angle Technique ching.yee@ucts.edu.my	Univers Techn
Bio-CAM2017: 076-053	Human Wrist Motion Classification using Decision Tree and Principle Component Analysis ching.yee@ucts.edu.my	Univers Techn
Bio-CAM2017: 026-054	Role of Multivitamins on the Development of Antibiotic Resistance Associated with Biofilm Formation on Central Venous Catheters - An Invitro Study sajna@mahsa.edu.my	MAHS
Bio-CAM2017: 025-055	A Pilot Scale Field Study of Using Phosphate Solubilizing Bacterial Native Microflora for the Use of Cheap Organic and Inorganic Phosphate Source for the Agriculture Practice of Solanum melongena (Eggplant) sajeesh@mahsa.edu.my	MAHS
Bio-CAM2017: 027-056	Application of Native Phosphate Solubilizing Bacteria for The Use of Cheap Organic and Inorganic Phosphate Source in Agricultural Practise of Capsicum Annum (Chilli) - A Pilot Scale Field Study jayan82aims@gmail.com	MAHS
Bio-CAM2017: 082-058	Characterization of Palm kernel shell and Coal Bottom Ash: A Potential feedstock and Catalyst for Biomass Gasification maham.hussain@gmail.com	
Bio-CAM2017: 084-061	Corrosion Investigation of Electrodeposited Cobalt-Nickel-Iron (CoNiFe) Fasteners with Different Electrodeposition Time nikrozlin@yahoo.com	
Bio-CAM2017: 088-062	Preparation of Nano Hydroxyapatite from Waste Bovine Bones Using Alkaline Digestion Method ismail.zainol@fsmt.upsi.edu.my	
Bio-CAM2017: 089-063	Characterization Stress Reactions to Stroop Colour-Word Test Using Spectral Analysis fatimahah@unikl.edu.my	
Bio-CAM2017: 008-064	Molecular Characterisation and Antibiogram of Water Quality Indicator Bacteria in Water Samples from Klang River nagaraja@mahsa.edu.my	MAHS
Bio-CAM2017: 028-065	Conductivity Study Of Diethylene Glycol Dibutyl Ether (Bdg) Plasticizer On Epoxidized Natural Rubber-50 (Enr50) Polymer Based Electrolyte System anistasnim@usm.my	
Bio-CAM2017: 077-066	Oil Palm Frond For The Adsorption Of Janus Green Dye thiamleng.chew@utp.edu.my	
Bio-CAM2017: 087-067	Synthesis of Small Pore Zeolite via Ultrasonic-Assisted Hydrothermal Synthesis tiffany_921206@hotmail.com	
Bio-CAM2017: 080-068	Highly Hydrophobic 3D Graphene-Carbon Nanotubes Composite Film for Oil Absorption chongcheen92@gmail.com	

Presentation ABSTRACT

NANOMATERIALS & NANOTECHNOLOGY

Bio_CAM2017__007_012

GAMMA-IRRADIATION METHOD TO SYNTHESIS AND CHARACTERIZATION PROPERTIES OF $GD_2O_2S:PR^{3+}$ NANOPHOSPHORS

Muhammad Hassyakirin Hasim, Irman Abdul Rahman, Sapizah Rahim, Muhammad Taqiyuddin Mawardi Ayob, Liyana Mahd Ali Napia, Shahidan Radiman
Nuclear Technology Research Centre, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600, Bangi, Selangor, Malaysia

Abstract. Praseodymium ion, Pr^{3+} doped Gd_2O_2S nanophosphors were successfully synthesized via gamma irradiation route. The effect of the gamma irradiation (0-150 kGy) on the structural, morphology, optical and photoluminescence properties of $Gd_2O_2S:Pr^{3+}$ were characterized via XRD, FESEM, UV-Vis, and photoluminescence spectroscopy. The as-formed material was tested by the thermogravimetric analysis (TGA) and differential thermal analysis (DTA). The chemical bonding of the samples also tested by Fourier transform infrared spectroscopy (FT-IR). Based on the X-ray diffraction (XRD) result confirmed the formation of hexagonal phase of $Gd_2O_2S:Pr^{3+}$ with the absence of any impurities. While the FESEM inspection revealed non-homogeneous hollow surface particles transform to needle shape of particles. UV-Vis spectra of $Gd_{1.90}O_2S:10\%Pr^{3+}$ showed an energy band gap value range from 4.75 to 4.92 eV. The optimum PL emission intensities of $Gd_{1.90}O_2S:10\%Pr^{3+}$ was 50 kGy dose of gamma irradiation. The spectrum was under 325 nm UV excitation show a strong green emission at 513 nm, which match to the $^3P_0 \rightarrow {}^3H_4$ transition of Pr^{3+} ions.

Keywords: gadolinium oxysulfide, praseodymium doped, gamma irradiation.

Bio_CAM2017__010_008

COMPARISON OF $GD_2O_2S:EU^{3+}$ NANOPHOSPHORS LUMINESCENT PROPERTIES PREPARED BY MICROWAVE AND Γ-IRRADIATION METHODS

*Sapizah Rahim[a], Muhammad Hassyakirin Hasim[a], Muhammad Taqiyuddin Mawardi Ayob[a], Irman Abdul Rahman[a] & Shahidan Radiman[a]**
[a]Nuclear Technology Research Centre, Faculty Science and Technology, Universiti Kebangsaan Malaysia, 43600, Bangi, Selangor, Malaysia

Abstract. A novel gadolinium oxysulfide doped with europium nanophosphors ($Gd_2O_2S:Eu^{3+}$-NPs) have been synthesized by two methods which are microwave and ^{60}Co γ-irradiation which give significant difference against morphology as well as their luminescent properties. The morphologies and phase formation were studied by the field emission scanning electron microscope (FESEM) and X-ray diffraction (XRD) technique while luminescent properties were observed by photoluminescence spectrometer (PL). The results show that the $Gd_2O_2S:Eu^{3+}$-NPs synthesized by these two methods were pure hexagonal phase without any impurities. However, γ-irradiation method produced smoother surface and uniform particles size compared to the microwave method. Strong red emissions were observed for γ-irradiation sample which corresponding to the $^5D_0 \rightarrow {}^7F_2$ transition of the europium ions, Eu^{3+}. The mechanisms of microwave and gamma irradiation that induced chemical reaction are discussed in details.

Keywords: nanophosphors, microwave method, γ-irradiation, luminescent.

THERMAL PROPERTIES OF CARBOXYMETHYL CELLULOSE (CMC) FILLED HALLOYSITE NANOTUBE (HNT) BIO-NANOCOMPOSITE FILMS

Kathiravan Suppiah, Teh Pei Leng, Salmah Husseinsyah, Rozyanty Rahman, Yeoh Cheow Keat, CW Heng
Universiti Malaysia Perlis, Division of Polymer Engineering, School of Materials Engineering, 02600 Jejawi, Perlis, Malaysia.

Abstract. This paper covered the effect of halloysite nanotube (HNT) content on thermal properties and moisture content of carboxymethyl cellulose (CMC)/halloysite nanotube (HNT) bio-nanocomposite films. The CMC/HNT bio-nanocomposite films were prepared by solvent casting method. The moisture content of CMC/HNT bio-nanocomposite films decreased with increasing HNT content. It was mainly attributed by the effective hydrophilic interaction of CMC matrix with HNT nanofiller, thus reduces the water molecules attack on the surface of the materials. Meanwhile, the thermogravimetric analysis (TGA) shows that the addition of HNT nanofiller enhanced the thermal stability of CMC/HNT bio-nanocomposites. The results showed the thermal degradation temperature (T_{d1} and T_{d2}) and residue remaining (char yields) at 800°C increased with increasing HNT filler. This indicated the effective dispersion of HNT nanofiller in CMC matrix exerts protective mechanical barrier against the thermal decomposition rate and improved thermal stability by shifting decomposition process to higher temperature values.

Keywords: Carboxymethyl cellulose, halloysite nanotube, bionanocomposite films, thermal properties, moisture content.

PEG COATED Bismuth Oxide NANORODS INDUCED RADIOSENSITIZATION ON MCF-7 BREAST CANCER UNDER IRRADIATION OF MEGAVOLTAGE RADIOTHERAPY BEAMS

Safri Zainal Abidin[1, 3], Zulfa Aiza Zulkifli[2], Khairunisak Abdul Razak[2], Hafiz Zin[3], Muhammad Amir Yunus[3], Wan Nordiana Rahman[1]
[1]School of Health Sciences, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia
[2]School of Materials and Mineral Resources Engineering, Universiti Sains Malaysia, 14300 Nibong Tebal, Penang, Malaysia
[3]Advanced Medical and Dental Institute, Universiti Sains Malaysia, 13200 Bertam, Penang, Malaysia

Abstract. Radiotherapy plays pivotal roles in the cancer treatment by delivering lethal dose of high energy radiation to the tumours. Gold nanoparticles have been introduced to increase the dose absorbed by tumour and hence increase radiotherapy therapeutic efficacy. In this study, bismuth oxide nanorods coated with polyethylene glycol (BiNR-PEG) is applied as radiosensitizer for megavoltage photon and electron beams. BiNR-PEG was synthesis using hydrothermal method that is biocompatible for radiotherapy application. Breast cancer cells (MCF-7) incubated with BiNR-PEG of size 60 nm and 0.5 μM of concentration. The irradiation were performed with 6 and 10 MV photon beam, 6 and 12 MeV electrons beam using ELEKTA LINAC. Irradiated cells were then prepared for clonogenic assay and cell survivals were obtained after 5 days incubation. Sensitization enhancement ratios (SER) were extrapolated from the cells survival curves. Morphological characterization shows the BiNR-PEG in rod form with average size of 60 nm and surface modification with PEG. The pure monoclinic of bismuth and oxygen peak was confirm by XRD and EDX. The results found that BiNR-PEG produce radiosensitization for photon and electron beams with SER value 3.64 for 6 MV and 4.18 for 10 MV. Meanwhile for electron beam, the SER show 3.18 for 6 MeV and 3.27 for 12 MeV. In conclusion, the BiNR-PEG induced radiosensitization on MCF-7 breast cancer cells when irradiated with megavoltage photon and electron beam. The shows potential for BiNR-PEG future application in radiotherapy as an alternative to gold nanoparticles.

Keywords: Nanoparticles, bismuth, radiotherapy.

EFFECT OF REDUCTION TEMPERATURE OF REDUCED GRAPHENE OXIDE (rGO) ON MORPHOLOGICAL, OPTICAL AND ELECTRICAL PROPERTIES

Erdawaty bt Mohd Jaafar, Muhammad Kashif; Siti Kudnie bt Sahari, Zainab bt Ngaini
Universiti Malaysia Sarawak (UNIMAS), 94300 Kota Samarahan, Sarawak, Malaysia.

Abstract. In this work, a new simple versatile method was used to achieve reduced graphene oxide (rGO) by treating graphene oxide (GO) in a hydrazine vapour and was varied by the different reduction temperature (50°C, 60°C, 70°C and 80°C). The rGO thin film was characterized by Scanning Electron Microscopy (SEM) and Fourier Transform Infrared Spectroscopy (FTIR) to ensure the morphological and optical properties of the thin film. In addition, the electrical characterization is carried out by the current-voltage (I-V) characteristic. The reduction temperature of rGO also affect the electrical properties as conductivity increase from 2.35 x 10^{-5} to 1.04 x 10^{-4} and decreasing to 6.49 x 10^{-5} due to the higher reduction temperature. The morphological and electrical data confirm that the properties of rGO are affected by the reduction temperature.

Keywords: Reduction temperature, reduced graphene oxide, electrical properties.

PHYSICO-CHEMICAL PROPERTIES OF SAPO-34 IMPREGNATED ZNO AS BIFUNCTIONAL HETEROGENEOUS CATALYST

Bashir Abubakar Abdulkadir[1], Anita Ramli[1], Lim Jun Wei[1], Yoshimitsu Uemura[2]
1Fundamental and Applied Sciences Department, Universiti Teknologi PETRONAS, Malaysia
2Chemical Engineering Department, Universiti Teknologi PETRONAS, Malaysia

Abstract. This paper focuses on the preparation, characterization and catalytic properties of ZnO incorporated into mesoporous SAPO-34 zeolite in order to evaluate its catalytic properties. The catalysts were prepared through low temperature (80 °C) wet impregnation method with different ZnO loadings and calcined at a temperature of 500 °C for 3 hours. Characterization techniques such as FTIR, temperature programmed desorption of ammonia (TPD-NH_3), XRD, N_2 adsorption/desorption by BET process and FESEM/EDX have been employed to characterize the prepared catalysts. The results obtained confirmed the presence of ZnO on the SAPO-34 as well as the successful formation of ZnO/SAPO-34 with high Si/Al ratio according to XRD and EDX findings. Moreover, XRD has shown that, there is little change from the original amorphous structure of the parent support (SAPO-34) towards crystalline structure as the loading of ZnO increases which lead to the increase in the pore volume and pore size of the catalysts due to the effects of ZnO and calcination. BET result has shown that, SAPO-34 and ZnO/SAPO-34 possess a very high surface area which will be highly effective in treating low grade oils for biodiesel production and other industrial application. Also, the catalysts showed acid-base properties according to the results obtained from TPD which confirmed ZnO/SAPO-34 can serve as a bifunctional catalyst in biodiesel production especially from the low grade oil. Besides, the result from the characterization displayed that, the prepared catalysts with mid-strong acidity and basicity may possess a high catalytic activity and selectivity for biodiesel production and other industrial application.

Keywords: ZnO, Catalyst, calcination, SAPO-34, heterogeneous.

STIGATING THE EFFECT OF SURFACE-CTIONALIZED MESOSTRUCTURED SILICA ON THE OLOGICAL PROPERTIES OF EOR SURFACTANT FOR CATION IN HTHP OIL RESERVOIR

mmed Falalu Hamza[1], Zulkifli Merican[1,], Hassan ani[1*], Chandra Mohan Sinnathambi[1], Stephen p[2].*

rtment of Fundamental and Applied Sciences, siti Teknologi PETRONAS, 32610, Bandar Seri dar, Perak, Malaysia

ute of Petroleum Engineering, Heriot-Watt rsity, Edinburgh, EH14 4AS, United Kingdom

ract. The harsh reservoir conditions, such as high ty, temperature and pressure (HTHP) have ntageous effects on the viscosity of enhanced oil ery (EOR) surfactants. This loss of viscosity had led cous fingering and ultimately poor oil recovery in surfactant flooding projects. In the present study, types of mesoporous silica; unmodified (SiO_2) and -functionalized modified (SiO_2-KH550), were gated on the viscosity enhancement of EOR tant (anionic surfactant) at ambient and harsh voir conditions (brine 3.5 %, temperature 120°C and re 2024 psi). The response surface methodology employed for the design of chemical formulations, visco-rheometer and HTHP electromagnetic eter were used for viscosity measurement. The cal interactions of the SiO_2 and SiO_2-KH550 with surfactant in the formulations had been established the results of different spectroscopic experiments ESEM, XRD, XPS, TGA etc.). The result indicated that SiO_2-KH550 had more effect in improving the sity of the surfactant than the unmodified SiO_2. this study has demonstrated that modified oparticles are better choice to improve the logical properties of EOR surfactants than odified nanoparticles for application in HTHP ervoir.

ywords: Enhanced oil recovery, viscosity, surfactant, ervoir.

SENSING AND PHYSICAL PROPERTIES OF ZnO NANOSTRUCTURES MEMBRANE PREPARED BY IMMERSION PROCESS FOR EGFET pH SENSOR

Aimi Bazilah Binti Rosli
UiTM SHAH ALAM

Abstract. Nanostructures of metal oxide semiconductors sensing membrane have received considerable attraction due to its large surface-to-volume ratios that leads to a short diffusion distance of the analyte towards the electrode surface, resulting in an improved pH sensitivities and response times. In this paper the zinc oxide (ZnO) nanostructures were fabricated at different deposition time ranging from 1 to 4 h using simple immersion process. The prepared samples were characterizing on physical properties and its ability as extended-gate field effect transistor (EGFET) pH sensor sensing membrane. From the results, we found that the deposition time play an important role in pH sensor performance. The best pH sensor performance was found at 3 h deposition time with 52.4 mV/pH and 0.9397 of sensitivity and linearity respectively.

Keywords: ZnO nanostructures, immersion process, deposition time, EGFET, pH sensor.

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SYNTHESIS OF SMALL PORE ZEOLITE VIA ULTRASONIC-ASSISTED HYDROTHERMAL SYNTHESIS

Tiffany Yit Siew Ng[a], Thiam Leng Chew[a], Yin Fong Yeong[a]
[a]CO_2 Research Centre, Chemical Enginering Department, Universiti Teknologi PETRONAS (UTP), 32610 Seri Iskandar, Perak, Malaysia

Abstract. Sonochemistry is the implementation of ultrasound wave to chemical reactions and processes. Remarkable progress has been achieved over the years on ultrasonic-assisted hydrothermal synthesis in zeolites. Ultrasonic irradiation is gaining popularity among researchers due to its ability in enhancing the zeolite crystallization and shortening significantly zeolite synthesis duration. In this project, zeolite RHO were synthesized via ultrasonic irradiation and followed by hydrothermal synthesis. The effect of ultrasonic irradiation on the synthesis of zeolite RHO was investigated. The zeolite RHO samples were characterized with X-ray Diffraction (XRD) and Field Emission Scanning Electron Microscopy (FESEM) coupled with Energy Dispersive X-ray (EDX). The application of ultrasonic irradiation treatment in current study has significantly shortened the synthesis duration of zeolite RHO from 7 days to 2 days compared to the conventional hydrothermal synthesis without ultrasonic irradiation treatment.

Keywords: Zeolite RHO; ultrasonic irradiation; hydrothermal synthesis; CO_2/CH_4 separation.

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CELLULOSE NANOFIBER FOR [illegible] APPLICATIONS

Nur Sharmila Sharip[a], Hidayah Ariff[a,b]
[a]Laboratory of Biopolymer and Derivatives, Tropical Forestry and Forest Products, Universiti Putra Malaysia, 43400 UPM, Selangor,Malaysia
[b]Department of Bioprocess Technology, Biotechnology and Biomolecular Sciences, Putra Malaysia, 43400 Serdang, Selangor, Malaysia

Abstract. Cellulose nanofibrils (CNF) is a [illegible] materials bearing an excellent mechanical [illegible] good biocompatibility, tailorable surface chemistry, interesting optical properties. Numerous [illegible] been done addressing CNF potentials and [illegible] such as for composites reinforcement, film, [illegible] barrier materials, aerogels, and biomedical [illegible] tissue engineering, orthopedics implant and [illegible] dressings. This review attempts to [illegible] highlight the current status, future prospects, advantages of CNF besides understanding mechanisms and interaction allowing [illegible] applications as advanced biomaterials.

Keywords: Nanocellulose, Cellulose [illegible] biomaterials, nanomaterials, applications.

EFFECT OF DEPOSITION TEMPERATURE ON GALLIUM DOPED ZINC OXIDE (Ga-ZnO) NANOSTRUCTURES USING SPRAY PYROLYSIS METHOD

Muhammad Kashif[1,2], Erdawaty Jaafar[1], Siti Kudnie Sahari[1] and Amir Azam Khan[2]
[1]Department of Electrical & Electronic Engineering, Faculty of Engineering, Universiti Malaysia Sarawak (UNIMAS), 94300 Kota Samarahan, Sarawak, Malaysia.
[2]Department of Mechanical Engineering, Faculty of Engineering, Universiti Malaysia Sarawak (UNIMAS), 94300 Kota Samarahan, Sarawak, Malaysia.

Abstract. Pure and Gallium-doped Zinc Oxide (Ga-ZnO) thin films were deposited on glass substrate at variant substrate temperature by using spray pyrolysis method. The effect of deposition temperature on the optical, structural and optical properties of pure and Gallium-doped Zinc Oxide (Ga-ZnO) were investigated by using UV-Vis spectrophotometer, X-Ray Diffractometer (XRD), and Current-Voltage (I-V) measurements. XRD reveals that the intensity of (0 0 2) plane increases as the temperature increases .The hexagonal wurtzite structure shows a polycrystalline nature of thin film in with (002), (101) and (001) planes . From the UV/Vis/NIR spectroscopy reveals that all Ga-ZnO films exhibit 80 % transmission at 600nm wavelength while ZnO film exhibit more than 50% transmission at the same wavelength. Optical band gap for Ga-ZnO shows a decrement from 3.34 eV to 3.32 eV as the temperature increases. The current is linearly proportional to the voltage for all the thin film when measured by IV measurement technique.

Keywords: ZnO, Optical, Electrical.