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NANOSPHERE

18th - 19th March 2020 UAE

Nanosphere UAE 2020

"Recent Trends & Challenges in Nano Science and Nanotechnology"

Flora Creek Deluxe Hotel Apartments, Dubai
United Arab Emirates

18th - 19th March, 2020

Organized by:

BioLEAGUES Worldwide

Preface

This book reports the Proceedings of the ***"Nanosphere UAE 2020"*** held at ***Flora Creek Deluxe Hotel Apartments, Dubai, United Arab Emirates*** on the ***18th & 19th of March– 2020***, organized by ***BioLEAGUES Worldwide***.

The publishing department has received more than 90 abstracts. After an initial review of the submitted abstracts, 22 papers were presented at the conference and were accepted for publication in the Conference Proceedings. The topics that are covered in the conference include Nano Engineering, Nano Medicine, Nano Science & Technology, Nano Fabrication, Nanomaterials, Synthesis and Application of Nanomaterials, Nano Electronics, Application of Nano Engineering & Technology, etc... We would like to thank all the participants for their contributions to the conference and the proceedings.

Reviewing papers of ***Nanosphere UAE 2020*** was a challenging process that relies on the goodwill of those people involved in the field. We invited more than 10 researchers from related fields to review papers for the presentation and the publication in the ***Nanosphere UAE 2020*** Proceeding. We would like to thank all the reviewers for their time and effort in reviewing the documents.

Finally, we would like to thank all the proceeding team members who with much dedication have given their constant support and priceless time to bring out the proceedings in a grand and successful manner. I am sure this proceeding will be a credit to a large group of people, and each one of us should be proud of its successful outcome…

Nanosphere UAE 2020

From BioLEAGUES Director's Desk…

On behalf of **BioLEAGUES Worldwide**, I am delighted to welcome all the delegates and participants around the globe to the ***Nanosphere UAE 2020*** which is going to be held at **Flora Creek Deluxe Hotel Apartments, Dubai, United Arab Emirates** on **March 18th & 19th, 2020.** This conference will revolve around the theme ***"Recent Trends & Challenges in Nano Science and Nanotechnology"***

It will be a great pleasure to join with Doctorates, Research Scholars and Academicians all around the globe. You are invited to be stimulated and enriched by the latest innovations in all the aspects of nanotechnology and allied areas, while delving into presentations surrounding transformative advances provided by a variety of disciplines.

I congratulate the Chair person, Organizing Secretary, Committee Members, coordinator BioLEAGUES and all the people involved for their efforts in organizing the **Nanosphere UAE 2020** and successfully conducting the International Conference and wish all the delegates and participants a very pleasant stay at Dubai, United Arab Emirates.

A. Siddth Kumar Chhajer
Director
BioLEAGUES Worldwide

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ISO 9001:2008
SoT 4287

To the attendees of the Nanosphere UAE 2020 Conference

On behalf of Organizing Committee, it gives me immense pleasure to welcome researchers, scientists, engineers, research scholars, industrial participants and budding students from all across the Globe to the "Nanosphere UAE 2020 Conference" which will be held on during March 18th & 19th 2020 at Dubai.

The Conference will highlight the need for collaboration and cooperation among individuals and industries from a wide range of Nanotechnology & Nanoscience professionals.

Conference will share latest research ideas and experiences in the area of Nanotechnology & Nanoscience. Separate Business Entrepreneur Meet will further add value to the participants. Conference will further provide opportunities to network with the leading scientists, researchers, as well as sponsors and exhibitors.

Please participate and make the event a grand success and provide a wonderful platform to refresh knowledge base and explore the innovations & initiatives in the NANO field.

I am sure that participants will have a productive, inspiring and enjoyable time during the conference. Do not miss out on taking part in this exciting and stimulating event.

Looking forward to meeting you all in Dubai.

(Dr. Anurag Ateet Gupta)
Chairman, IPR Apex Committee & Senior Mentor, PDPU
(Former Executive Director, IndianOil R&D Centre)

From Bioleagues CEO's Desk…

It is indeed a privilege to acknowledge and thank all the supporters and organizers of the "**Nanosphere UAE 2020**", who contributed greatly to organize the conference successfully.

I would like to acknowledge and thank the Chief Guest for his/her valuable contribution in the ***Nanosphere UAE 2020, Dubai, United Arab Emirates.***

My special thanks to all our Special Guests who so graciously accepted our invitation to participate in the conference. I also wish to acknowledge and thank the sponsors of the conference whose financial support was extremely grateful.

I would like to specially thank our Advisory Committee Members from various Organization whose continuous support have helped us plan and execute the conference successfully.

I am highly indebted to the contribution given by all the Scientists, Doctorates, Research Scholars, Academicians and students to the conference.

Mr. R. B Satapathy
Chief Executive Officer
BioLEAGUES Worldwide

Keynote Speaker

Importance of Theranostics in the Treatment of Brain Infections

Naveed Ahmed Khan
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Ruqaiyyah Siddiqui
American University of Sharjah, UAE

Abstract

The morbidity and mortality associated with central nervous system has remained significant despite modern developments in healthcare and antimicrobial chemotherapy. The low awareness, delayed diagnosis and lack of effective drugs are major hurdles to overcome these challenges. Nanomaterials have emerged as vital tools for concurrent diagnosis and therapy which are commonly referred to as theranostics. Nanomaterials offer highly sensitive diagnostic systems and viable therapeutic effects as a single modality. There has been good progress to develop nanomaterials based efficient theranostic systems against numerous kinds of tumors but this field is yet immature in the context of infectious diseases, particularly parasitic infections. Herein, we describe the potential value of theranostic applications of nanomaterials against microbes causing brain infections.

Biography:

Naveed Ahmed Khan is Professor and Head of the Department of Biology, Chemistry and Environmental Sciences at the American University of Sharjah (AUS). Prior to joining AUS, he has held positions at Tufts University School of Medicine, Boston, USA; Johns Hopkins University School of Medicine, Baltimore, USA; University of London, UK; University of Nottingham, UK; Aga Khan University, Pakistan and Sunway University, Malaysia. With research grants of over $2 million, he has produced over 240 peer-reviewed publications, 7 books and 7 chapters, and guided over 40 graduate students. In recognition of his research efforts, he has received awards from the UK, USA, Pakistan and Malaysia. His work on the search for new antibiotics from animals living in polluted environments caught worldwide attention where it was discussed in peer-reviewed journals and made into documentaries shown on leading news channels. Google search of "Naveed Khan and Cockroach" yields thousands of web pages.

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Nanosphere UAE 2020

" Recent Trends & Challenges in Nano Science and Nanotechnology "

ABSTRACTS

Dubai, United Arab Emirates

18th - 19th March, 2020

Silver and Copper Acute Effects on Membrane Proteins and Impact on Photosynthetic and Respiratory Complexes in Bacteria

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Abstract

Silver (Ag^+) and copper (Cu^+) ions have been used for centuries in industry, as well as antimicrobial agents in agriculture and health care. Nowadays, Ag^+ is also widely used in the field of nanotechnology. Yet, the underlying mechanisms driving toxicity of Ag^+ ions *in vivo* are poorly characterized. It is well known that exposure to excess metal impairs the photosynthetic apparatus of plants and algae. Here, we show that the light-harvesting complex II (LH2) is the primary target of Ag^+ and Cu^+ exposure in the purple bacterium *Rubrivivax gelatinosus*. Ag^+ and Cu^+ specifically

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inactivate the 800-nm absorbing bacteriochlorophyll *a* (B800), while Ni^{2+} or Cd^{2+} treatment had no effect. This was further supported by analyses of $CuSO_4$- or $AgNO_3$-treated membrane proteins. Indeed, this treatment induced changes in the LH2 absorption spectrum related to the disruption of the interaction of B800 molecules with the LH2 protein. This caused the release of B800 molecules and subsequently impacted the spectral properties of the carotenoids within the 850-nm absorbing LH2. Moreover, previous studies have suggested that Ag^+ can affect the respiratory chain in mitochondria and bacteria. Our data demonstrated that exposure to Ag^+, both *in vivo* and *in vitro*, caused a decrease of cytochrome *c* oxidase and succinate dehydrogenase activities. Ag^+ inhibition of these respiratory complexes was also observed in *Escherichia coli*, but not in *Bacillus subtilis*.

Biography

I am from Saudi Arabia, I am a PhD student at University Paris-Sud, Paris-Saclay in Microbiology and Metals field. I have been working on a project entitled "METAL STRESS AND TOXICITY IN BACTERIA: Multiscale investigation of the effect and the target of ions and metal nanoparticles. I obtained my MS degree in Biology from Fairleigh Dickinson University, NJ- USA. I worked on project about "Biopolymers Containing Plant Extracts Show Antimicrobial Activity Against Skin Pathogens". My BS degree was also in Biology at Umm Al-Qura university, Makkah- SA

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Removal of Procion Brilliant Red He-7b Dye Using Nickel Oxide Nanoparticles Enhanced With Cetyltrimethyl Ammonium Bromide

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Tryphosa Daniel Gera
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Abstract

The Nickel Oxide nanoparticles were prepared from Nickel Sulphate using chemical co-precipitation method. The properties like size, morphology and elemental composition were studied and characterized by Scanning Electron Microscopy (SEM), Energy Dispersive X-ray (EDS), Fourier Transform Infrared (FT-IR) spectroscopy and X-ray Diffraction (XRD) techniques. The adsorption of Procion Brilliant Red HE-7B dye on Cetyltrimethyl Ammonium Bromide coated Nickel Oxide nanoparticles was studied in Batch mode. The experimental data were analyzed using Langmuir and Freundlich isotherm models. The adsorption of Procion Brilliant Red HE-7B dye on cetyltrimethyl ammonium bromide coated Nickel Oxide nanoparticles showed a better fit to the Langmuir isotherm model with high correlation coefficients than the Freundlich isotherm model and the value of correlation coefficient for the fit of experimental isotherm data to langmuir equation is more closer to 1.0 than that for the freundlich isotherm (RL2=0.953, RF2=0.466). Therefore, the values of maximum monolayer capacity and isotherm constant were obtained as qmax = 45 mgg-1 and KL = 0.052mg-1. Pseudo-first order, Pseudo-second order kinetic models and intraparticle diffusion model were used to analyze the kinetic data. Kinetic data revealed that the adsorption is controlled by film diffusion and followed the pseudo-second order kinetic model more positively than other models.

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Biography

Dr. N. K. Srivastava did his B. Tech from HBTI Kanpur, M. Tech. in Chemical Engineering from IIT Roorkee and Ph. D. in Chemical Engineering from NIT Jalandhar. Presently, he is working as Associate Professor in the Department of Chemical Engineering at Dr. B. R. Ambedkar NIT Jalandhar. He has 22 years of experience in teaching and research. His areas of interest are Wastewater Treatment, Air Pollution Control, Water Conservation and Management and New and Renewable Energy. He is Reviewer of 24 International Refereed SCI/ Scopus Indexed Journals and member of Organizing Committees of 15 International Conferences of repute.

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Plasmonic Nanospheres for Raman Signal Enhancement from Graphene Oxides towards Biosensing and Biomedicine Applications

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Department of Electronics and Electrical Engineering, University of Sheffield, Sheffield S3 7HQ, UK

Abstract

Gold plasmonic nanospheres are studied for Raman signal enhancement from graphene oxides and graphene-oxide nanostructure interfaces through Raman characterization study. 50 nm resonating gold nanoparticles are used to enhance the Raman signal from graphene oxides and graphene oxide-nanostructure interface up to 10 folds showing its possible application in molecular sensing. We have experimentally studied that the presence of 5 nm Au nanoparticles with graphene oxides (GO) and reduced Graphene Oxides (rGO) shows enhanced localized intensity in the Raman signals by reducing the defects in the graphene oxide planes. This property of the Au nanospheres along with the biocompatible and chemically stable graphene oxides may find application in plasmonic photothermal therapy towards tumor cells.

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Biography

Dr. Saraswati Behera work as a research Associate in the EEE Department at the University of Sheffield, United Kingdom in the field of Nanophotonics. Prior to this, she has worked as a Postdoctoral researcher at Yonsei University, Seoul, South Korea for a year on Graphene Plasmonics. She has obtained her PhD in Physics from Indian Institute of Technology Delhi India, in the field of Optics and Photonics. She has obtained her MSc and MPhil in Physics from Ravenshaw University Cuttack. She has research experience of more than 7.5 years in the field of optics and its applications to photonics and plasmonics. Her research interests are in nanofabrication and micro/ nanoscale light mater interactions for applications towards biosensors and in efficient optical and optoelectronic devices.

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Synthesis and Characterization of Silver-Graphene Nanocomposites for New Class of Plasmonic Photo Electric Conversion Device

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V Indian Institute of Technology, Guwahati, India
Dr. Harsh Chaturvedi
Indian Institute of Technology, Guwahati, India
Prof. Pranab Goswami
Indian Institute of Technology, Guwahati, India

Abstract

Plasmonics is an evolving research area of optics and nanoelectronics in today's world by confining light of relatively large wavelengths to nanoscale. Graphene's optics and photonics have been reviewed several times and it is seen to have tunable and adjustable inherent plasmons. However, graphene with noble metal nanostructure enhances its plasmonic properties and offers a variety of applications such as efficient photodetectors, ultrasensitive chemical sensors, Surface Enhanced Raman Scattering (SERS) or biosensors. In the current work, silver (Ag) nanoparticles were deposited on Graphene (G) sheets to develop Ag/G nanocomposites via a simple process of thermal reduction wherein Graphite Oxide (GO) is used as a precursor to graphene, silver nitrate (AgNO3) as a precursor to Ag nanoparticles, and sodium citrate as an environmentally-friendly reduction and stabilizer. Through enhanced modified Hummer process, GO is synthesized from graphite powder. The produced Ag/G nanocomposites were characterized by X-Ray Diffraction (XRD), Field Scanning Electron Microscopy (FESEM), UV visible spectra, and Raman Spectra (RS). For developing a new plasmonic energy harvesting system, the plasmonic properties of Ag/G nanocomposites coupled with TiO2 thin film will be used. Simulation of the nanomaterial, the impact of the material's dimensions, geometry and dielectric properties, and optimization of the unit's architecture will be carried out and analyzed. Further an optimized framework will be presented for the fabricated device along with the inherent plasmonic physics.

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Biography:

Ksh Priyalakshmi Devi received her bachelor's degree in Electrical Engineering from Lukhdhirji Engineering College, India in 2011. Later she studied for M Tech in Energy Technology from Maulana Azad National Institute of Technology (MANIT), India and graduated from MANIT in 2013. She is currently a PhD student at Indian Institute of Technology Guwahati in Centre for Energy under Prof. Pranab Goswami and Dr. Harsh Chaturvedi. Her current research interest include searching for improved plasmonic materials and fabrication of plasmonic energy harvesting device.

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Energy Research Institute (ERI)

Performance, Modeling, Measurements and Simulation of Energy Efficient for Heat exchanger, Refrigeration and Air Conditioning

Abdeen Omer
Energy Research Institute (ERI), Nottingham, UK

Abstract

Over the years, all parts of a commercial refrigerator, such as the compressor, heat exchangers, refrigerant, and packaging, have been improved considerably due to the extensive research and development efforts carried out by academia and industry. However, the achieved and anticipated improvement in conventional refrigeration technology are incremental since this technology is already nearing its fundamentals limit of energy efficiency is described is 'magnetic refrigeration' which is an evolving cooling technology. The word 'green' designates more than a colour. It is a way of life, one that is becoming more and more common throughout the world. An interesting topic on 'sustainable technologies for a greener world' details about what each technology is and how it achieves green goals. Recently, conventional chillers using absorption technology consume energy for hot water generator but absorption chillers carry no energy saving. With the aim of providing a single point solution for this dual purpose application, a product is launched but can provide simultaneous chilling and heating using its vapour absorption technology with 40% saving in heating energy. Using energy efficiency and managing customer energy use has become an integral and valuable exercise. The reason for this is green technology helps to sustain life on earth. This not only applies to humans but to plants, animals and the rest of the ecosystem. Energy prices and consumption will always be on an upward trajectory. In fact, energy costs have steadily risen over last decade and are expected to carry on doing so as consumption grows.

Biography:

Dr. Abdeen Mustafa Omer (BSc, MSc, PhD) is an Associate Researcher at Energy Research Institute (ERI). He obtained both his PhD degree in the Built Environment and Master of Philosophy degree in Renewable Energy Technologies from the University of Nottingham. He is qualified Mechanical

Engineer with a proven track record within the water industry and renewable energy technologies. He has been graduated from University of El Menoufia, Egypt, BSc in Mechanical Engineering. His previous experience involved being a member of the research team at the National Council for Research/Energy Research Institute in Sudan and working director of research and development for National Water Equipment Manufacturing Co. Ltd., Sudan. He has been listed in the book WHO'S WHO in the World 2005, 2006, 2007 and 2010. He has published over 300 papers in peer-reviewed journals, 200 review articles, 17 books and 150 chapters in books.

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Comparative Study of an Anisotropic and Isotropic One Dimensional Porous Silicon Photonic Crystal Microcavity For Optical Sensing Applications

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Sonia Bansal
Department of Applied Science and Humanities, JC Bose University of Science and Technology, Haryana, India

Shafaque Rahman
Department of Applied Science and Humanities, JC Bose University of Science and Technology, Haryana, India

Abstract

A theoretical study of one dimensional porous silicon single defect layer microcavity structure with anisotropic and isotropic effects for optical sensing of chemical and bio-analyte is presented. The reflection spectrum study is done with the help of Bruggeman's Effective Medium Approximation (BEMA) and general transfer matrix approach. The shift in wavelength of reflection spectrum is analysed for the detection of analyte in the pores of the structure. The optical sensing is done with different refractive indices of analyte. A linear relationship between the observed wavelength shift in reflection spectrum and the refractive index of analyte is obtained. A comparison of sensitivity is also done with anisotropic and isotropic effects introduced in the microcavity structure. The range of wavelength chosen for the sensing purpose is 400nm-1200nm with the microcavity wavelength around 800 nm. The anisotropic microcavity structure is found to be more sensitive and can be used for optical sensing of chemical-analytes, bio-analytes, gas, environmental pollutants, etc.

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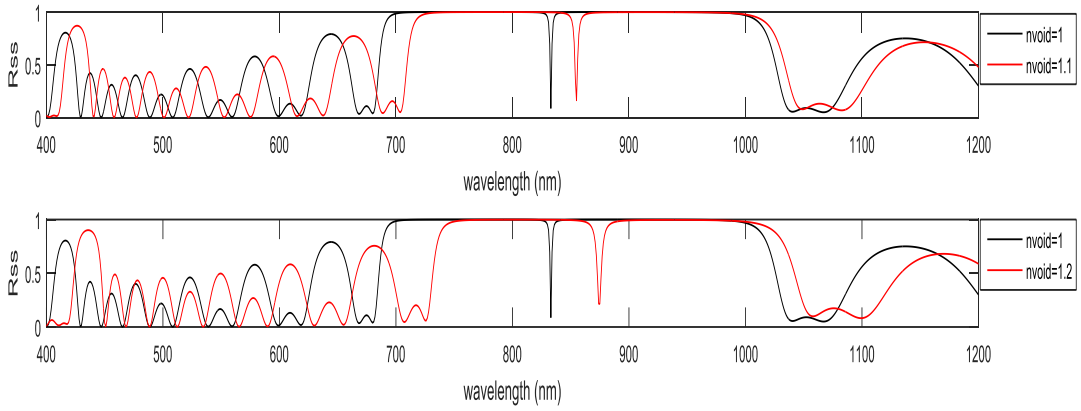

Biography

Dr. Aurangzeb Khurram Hafiz is currently working as Associate Professor and Officiating Director at Center for Nanoscience and Nanotechnology, Jamia Millia Islamia, New Delhi. He completed his PhD from Jawahar Lal Nehru University in 2006. His research interest includes Quantum Optics and Nanophotonics. He has published more than 70 research articles in journals and proceedings of high repute. He has guided eight PhD scholars and innumerable M.Sc. and M.Tech projects.

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Culture-Based Leadership of a School Principal for Millennial Generation in Asean

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Sari Mulia University, Banjarmasin, Indonesia
Anggrita Sari
Sari Mulia University, Banjarmasin, Indonesia

Abstract

The era of the ASEAN Economic Community (AEC) is an era of regional globalization, and this needs to be examined carefully in the world of education in Indonesia so that Indonesia's human resources are ready to face increasingly fierce competition with other countries. In this regard, it is necessary to lead a culture-based education leader at the school level to produce quality education that is able to produce students who have personality integrity, disciplined attitude, creative, innovative, and competitive. Education in ASEAN countries has now entered the era of globalization, where one of them is marked by the ease in which people get information from various parts of the world as a result of rapid technological developments. This has both positive and negative influences on those who receive it. The positive influence of globalization on changes in values and attitudes causes a shift in values and attitudes of all irrational people to be rational while the negative influence of globalization on society is that people feel facilitated with advanced technology that makes them feel they no longer need others in their activities, where sometimes they forget that they are social beings who need to interact with one another.

Keywords:

culture-based leaders, globalization, quality of education

Biography:

1. Agustinus Hermino is a Doctor in Educational Management and author some books in Indonesia focus in education. At this time he is working as a Vice President of the Sari Mulia University, Banjarmasin, Indonesia, and also as a researcher which focus in the development of primary education especially in the rural and remote area in Indonesia and some countries in ASEAN. In the other activity, he is also as an International Techical Official (ITO) for Open Water Swimming (OWS) licenced by FINA.

2. Dwi Sogi Sri Redjeki is a Doctor in Educational Management and also as the Head of Indah Banjarmasin Foudation which support Sari Mulia University, Banjarmasin, Indonesia. Her research focus major in the higher education, especially in the gender perspective.

3. Anggrita Sari is a Vice President of the Sari Mulia University, Banjarmasin, Indonesia. Her specialist is in the curriculum and public health. Her research focus major in the public health, especially for community, midwifery, and nursing.

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An Insight into Spatial Sequencing and Surface Confinement of the Multi-functional Catalysts for Aerobic Alcohol Oxidation

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Abstract

Optimization of the catalytic activity of enzymes relies on confinement and co-operativity among the multifunctional groups in the designing principles used by Nature. The biological system involves precise sequencing of the protein encodes for specific chain folding to pre-organize critical amino acid side chains within defined binding pockets, allowing synergistic catalytic activation pathways expressed and triggered. Inspired by nature, we focus on the artificial synthesis of the preorganization of the (pyta)Cu/TEMPO/imidazole (pyta = pyridyltriazole, TEMPO = 2,2,6,6-tetramethylpiperidine-N-oxyl) catalytic triad on mesoporous silica and compare their catalytic activity for the aerobic oxidation of alcohols. Various synthetic approaches were used to design the mixed monolayer of the trifunctional catalyst (a) mixed monolayer approach; (b) sequence controlled oligomers approach; (c) co-grating oligomers and monomer approach; (d) co-grafting the discrete catalytic oligomers. Furthermore, an analogy with enzymes this study will focus on the sequence definition combined with surface grafting induce the optimized distribution, both radially (interchain) and axially (intrachain), of the various functional groups assisting in an impressive improvement of catalytic efficiency results predominantly from “matched” interchain interactions in the surface-confined system. The concept presented here hence uncovers a new paradigm in the design of multifunctional molecular assemblies to control functions at a level approaching biological precision.

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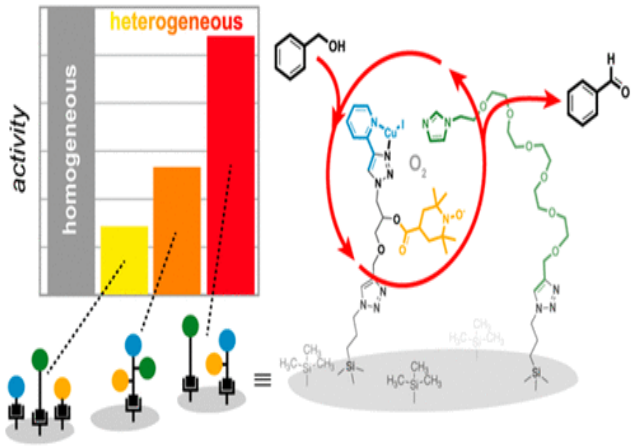

Figure 1. Multifunctional catalytic system for aerobic alcohol oxidation

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Computational Modeling for Nano Indentation Process in Crystalline Material based on Dislocation Mediated Plasticity

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Abstract

In this article, a loading process of the micro/Nano-indentation test is simulated based on physical plasticity. The total energy of process is obtained by evaluating different terms such as dislocations density energy, energy caused by contact of indenter to the material and other terms of classic mechanic's. The physical domain of region beneath the indenter is mapped to a unit cubic domain as a computational domain by using a homographic mapping formulation. For the first time by using the principle of minimum energy differential equations of the micro-indentation process is evaluated for a FCC crystal. Three main coupled differential equations, twelve necessary robin boundary conditions and eight physical boundary conditions are solved by using a generalized differential quadrature method based on the Gauss-Chebyshev-Lobato polynomials. It is seen that the applied method is more efficient and gets closer results to experiments. Finally, material behavior to different conical angles of indenter for the FCC crystal is compared.

Biography

Dr. Asghar Zajkani is an assistant professor of International University of Imam Khomeini, in Qazvin city of Iran. His main research area is concentrated on Multiscale modeling of Micro/Nanoparticle reinforced composites MEMS, Nonlocal theories, Strain Gradient Plasticity. In addition, he is working on the Material Modeling, Texture Engineering, and Microstructures Evolution in Advanced Material Processing, Dislocation Mediated Plasticity, and Nano Indentation. He also, researches on the fields of Biologically Inspired Technologies and High Performance Bio-composites. He has published more than 40 peer reviewed journal papers with 25 international conference papers.

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Graphene Oxide Coated Bio-Matrices for Efficient Separation of Bacteria from Water

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Jitendra Kumar Pandey
University of Petroleum and Energy Studies, BIDHOLI, Prem Nagar, Dehradun, Uttarakhand, India

Abstract

The study presented in this article investigated the efficacy of Graphene Oxide (GO) Coated Chitin (GO-CH) flask and Activated Bio-Char (GO-AC) for separation of Escherichia coli from water. The GO-CH and GO-AC has been characterized with FTIR, XRD, SEM and BET analysis. The efficacy of both types of adsorbents removal of Escherichia coli were monitored initially in batch mode. The GO-AC showed better bacteria separation efficacy than GO-CH in batch mode. Thus, the GO-AC was tested for bacteria separation in column mode. Column studies were done with solution with different bacterial load, different influent flow rate and bed height. The data indicated that the columns with higher bed height, slower flow rate and with low bacterial load showed better performance. The bio-matrices used in this study was found to be economical and technically superior to the available alternatives. Though, GO-AC showed better performance in both batch and column mode, more detail investigations is needed to understand the potential of the GO coated bio-matrices for large scale water treatment.

Biography

Dr. Suvendu Manna currently working in the University of Petroleum and Energy Studies, India as an Assistant professor. Dr. Manna did his Ph.D. From Indian Institute of Technology Kharagpur, India in 2015. He also did postdoctoral research for 3 years. Till date Dr. Manna authored or co-authored 24 articles in International journals and 9 book chapters. Professor JK Pandey is currently a Professor and Associate Dean for R&D in University of Petroleum and Energy Studies, India. Prof. Pandey did his Ph.D from National Chemical Laboratory, Pune, India and did postdoctoral research in many international institutes. Prof. Pandey authored or co-authored more than 70 journal articles, 15 patent applications and wrote many books and book chapters.

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New Technologies and Trends in Architecture

Dr. Dalia O. Hafiz
Al-Ghurair University, UAE

Abstract
The adoption of new technologies will likely birth new city typologies with unique buildings and architecture. Such new technologies can be categorized into several applications. First, the new nanomaterials, which have new capabilities and characteristics. Second, new design techniques, construction methods and software. In addition to new nano-technologies that will take place in new cities varying from transportation to infrastructure. All these new trends will not only affect the architecture of the buildings but will also have a hight effect on the occupants' needs and city structure and architecture. Architects, engineers, city planners, and decision-makers should carefully consider such technologies for the benefits of the humans, and to avoid any possible undesirable effects on the structure of the city and most importantly the comfort of its residences.
This document aims at examining new nano-technological trends that can highly affect the architecture of buildings and cities. It also examines possible changes in the new and smart cities associated with some of these trends, to maintain safety, sustainability and most importantly enhancing the quality of the buildings and city's occupants' life while implementing such technologies.

Biography:
Dalia is an architect, academic, researcher, and phenomenologist. She received her Ph.D. and master's degree from the school of Architecture and Design, Virginia Tech.
She has a variety of research interests including exploring ways to enhance the relationship between architecture education and practice, daylighting dynamism, visual discomfort, behavioral decisions in transit stations, wayfinding in interior spaces and outdoors, design aid for visually impaired, autonomous transportation role in changing the architecture of the city and enhancing the quality of its citizens.
Dalia published articles related to her research in several conferences, newsletters, and publications worldwide in addition to three book chapters.

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Mechanical and Durability Performance of Cementitious Mortars with Carbon Nano-Tubes (CNTs) and Carbon Nano-Fibres (CNFs)

Dr. Niragi Dave
Pandit Deendayal Petroleum University, India

Abstract

Experimental study on the effect of mechanical behavior of Carbon Nano-Tubes (CNT) and Carbon Nano-Fibres (CNF), prepared using Ordinary Portland Cement (OPC) with optimum dosage of 0.1 % of CNT/CNF. Tests were carried out to characterize the mechanical behavior of CNT mortars and CNF mortars at 28 days and results obtained were compared with the corresponding values obtained for controlled mortars (100% OPC). The entire specimens were prepared, cured and tested as per the Indian standard code of practice. In addition to that durability of the mortar mix was determined via Rapid Chloride Permeability Test (RCPT). The results showed that the compressive, tensile, and flexural strength for specimens containing 0.1% MWCNTs/CNFs (optimum dosage of MWCNT/CNFs) were 27, 15, and 11% more than that of the control samples, respectively and with carbon nano-fibers 24%, 13% and 9% higher than the control specimens. Also, it was observed that the application of MWCNTs and CNFs can change the shape and the amount of voids, thereby imposing a significant impact on the mortar behaviour. For the optimum dosage of MWCNTs and CNFs, the porosity and MAV decreased about 65 and 78%, respectively. These findings were also supported with the microstructural studies of hardened mortars using scanning electron microscopy (SEM). The image processing of the petrographic specimens and probability theorization revealed that the circularity of the voids had a significant impact on the flexural strength of the mortars, while the compressive strength was mostly affected by only the amount of porosity.

Biography

Niragi Dave born on 28/09/1979 is an Assistant Professor in Department of Civil & Environmental Engineering at Pandit Deendayal Petroleum University; Gandhinagar (Gujarat). She has done her B.Tech. in Civil from L. E. College, Morbi (Saurastra), M.Tech. from S.P. University with a specialization of Structural Engineering & Ph.D from North Cap University, Gurgaon-Haryana. Her Current areas of research are material Characterization, Nano materials and smart materials. She has 12 years of teaching experience at various prestigious institutions. She has published more than 20

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research papers international journals, in various national & international conferences, seminars & workshops in India.

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Utilizations and Applications of Nanoparticles in Enhanced Oil Recovery

Essa Georges Lwisa
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Ameera Rasheed Mohammad
United Arab University, UAE

Abstract

Enhanced Oil Recovery (EOR) techniques are currently one of the top priorities of technological development in the oil industry owing to the increasing demand for oil, which cannot be fulfilled by primary or secondary production methods. The main function of the enhanced oil recovery process is to displace oil in the production wells by the injection of different fluids to supplement the natural energy present in the reservoir. moreover, these injecting fluids can alter the reservoir`s properties; for example, they can lower the Interfacial Tension (IFT) between oil and water, alter the rocks` wettability, change the pH value, form emulsions aid in clay migration and reduce the oil viscosity.
Nano particles have a small size and therefore have a very large surface area and a high surface density charge, which means that a small concentration of nano partials has the same effect of the conventional chemicals when used in high concentrations.
Nanoparticles can change the wettability of reservoir rocks from oil-wet into water-wet and reduce the oil-water interfacial tension, and lower the viscosity of crude oil, therefore, enhanced oil recovery using nanoparticle technology is an alternative solution to the traditional chemical methods used for the same purpose.

Biography:

Essa Georges Lwisa is a petroleum engineer, an expert in core analysis, rock properties, and enhanced oil recovery. He is also an Auditor for standards (ISO 45001:2018), (ISO 19011:2018), and (ISO/IEC 17025:2017)

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He works at the United Arab Emirates University- Chemical and Petroleum Engineering department since 2009 as a core analysis lab engineer, before that he worked at Core Laboratories Intl. for four years as a SCAL analyst.
Essa is a technical assessor at Emirates National Accreditation System (ENAS), a trainer at H&A Professional Development Advisory, a member of American Society of Testing and Materials (ASTM), Society of Petroleum Engineers (SPE), and Society of Core Analysis.
He has participated in many conferences and published tens of scientific papers in respected journals, and won several awards.
Essa is a member of editorial board at the International Journal of Petro chemistry and Research (ISSN: 2638-1974), and Journal of Chemistry and Applied Chemical Engineering (ISSN : 2576-3954)
Essa holds a master's degree of Science in Petroleum Engineering
Far from engineering, Essa is a co-founder and a lead player at the United Arab Emirates Music Orchestra.

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Experimental Investigation of Copper and Alumina Nano-Fluids on the Performance of Heat Pump

Faizan Ahmed
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Abstract

In the present work, an experimental investigation is carried out to study the influence of copper and alumina nanofluids on the performance of heat pump. Both nanofluids were prepared in two volume fractions of 2% and 4% with water as the base fluid. These nanofluids were used as an external jacket around the evaporator coil of the heat pump. Based on the experimental results, it was observed that the volume fraction of the nanofluids have a direct relation with the Coefficient Of Performance (COP) of heat pump. At the higher volume fraction, the COP was found to enhance significantly by 19% and 27% for alumina and copper nanofluids, respectively. It was observed that the utilization of copper nanofluid resulted in superior performance of heat pump in comparison to alumina nanofluid. Further, the heat leak through the system was also estimated for each case by applying the energy balance across the heat pump.

Biography

Faizan Ahmed is presently an Instructor in Prince Mohammed Bin Fahd Univeristy, Al Khobar, Saudi Arabia. He has a Master degree from King Fahd University of Petroleum & Minerals (Saudi Arabia) with specialization in thermal sciences. His research interest includes solar and wind energy, heat transfer, nano-fluids, and water desalination.

Single Source Precursor Approach for the Synthesis of ZnO/CdS Core-shell Nanostructures for Photovoltaic Applications

Dr. Rama Gaur

Pandit Deendayal Petroleum University, Knowledge Corridor, Gandhinagar, Gujarat, India

Abstract

The escalated and savage consumption of conventional sources of energy are leading to forecasted energy and environmental crises. The growing demand for energy has created an urge to generate sustainable alternatives in every sector. Core-shell nanostructures with a wide band gap and narrow band gap semiconductor have attracted attention for their extended absorption of solar spectrum. Also, the sensitization of a wide band gap semiconductor with a narrow band gap material, enhances charge transport characteristics in ZnO-CdS core shell nanohybrids. The present study reports the synthesis of ZnO/CdS core-shell nanostructures by facile thermal decomposition in diphenyl ether at 200°C. The synthesis of the core-shell nanostructure have been carried out by both multiple precursor and single source precursor approach for comparative analysis. The preliminary examination of core-shell nanohybrids confirmed non uniform shell coating when multiple precursors were used. FE-SEM, TEM and EDX results confirmed uniform shell coating of CdS nanoparticle over ZnO nanorods when single source precursor was used. The nanohybrids were characterized using an array of analytical techniques. The optical properties of the nanohybrids have been investigated to evaluate their candidature for photovoltaic application. The charge transfer characteristics on the nanohybrids were investigated by cyclic voltammetry measurements. The results indicated enhanced charge transfer characteristics in the case of ZnO/CdS core-shell nanohybrids compared to pure ZnO and CdS.

Keywords: ZnO/CdS nanoparticles, thermal decomposition, Core-shell, single source precursor

Biography

Dr. Rama Gaur has completed her Ph.D. from Indian Institute of Technology Roorkee, India in the area of nanoscale materials. She has expertise in synthesis of metal sulfide nanostructures and their

application in photocatalysis and solar energy applications. She is the Assistant Professor of Chemistry, in the Department of Science, School of Technology, Pandit Deendayal Petroleum University, Gandhinagar, Gujarat, India. She has published 07 papers in reputed journals and has participated in various international conferences.

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Analysis of the Influence of Social- Economic and Natural Disasters on Household Income Inequality Indonesia

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Putri Ayu
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Abstract

The Sustainable Development Goals (SDGs) 2015–2030 officially replace the Millennium Development Goals (MDGs). One of the objectives of the 17 SDGs is to reduce inequality. The indicator issued by the World Bank is one indicator measuring the level of income distribution. The level of income inequality according to World Bank criteria is centered on the 40 percent of the lowest income population. Data from the World Bank revealed that the Indonesian Gini Index increased from 30.0 in the 1990s to 39.0 in 2017. Based on this, the studies aims to analyze the factors that affect the level of household income in Indonesia. The lower inequality will bring the economy towards sustainable development. This research very interesting because it contributes to designing what factors must be improved to reduce income inequality. The method used is logit model with IFLS-5 data in book 2, 3A, and 3B by using stata. The variables used in this study are income inequality aggregated from the lowest 40% population, education level, health status, electricity consumption, migration, tv use, and toilets and natural disasters. The level of education and having the toilets in homes significantly decreases the probability of income inequality. Natural disasters and migration for people affected by natural disasters significant increase the probability of income inequality. While electricity consumption and the presence of TV have no effect in the probability of high income inequality. One interesting finding is that people affected by a landslide disaster significantly increase the probability of income inequality. It is hoped that the government will pay special attention to Indonesian education, and support facilities to reduce income inequality that can make Indonesia into SDGs. As well as the presence of rapid response to overcome or reduce the impact of natural disasters that can increase income inequality.

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Keywords

inequality;educ; health; disaster; ifls5

Biography

Syaiful Anwar is lecturer an researcher in Economics Science of Economic Faculty in Andalas University, Indonesia. Interesting in Social Capital, Monetary and Health Economics.

Smart Contact Lens Sensors

Haider Butt
Khalifa University, UAE

Abstract

One of the key challenges in producing nanostructures based commercial healthcare applications is the scaling up of the fabrication process. We present the fabrication of dye based nanostructures by using the fast and commercially viable method of holographic laser ablation. In this method we use a single beam of a nanosecond laser, which after reflecting from a mirror self-interferes. This results in an interference pattern which can be used to ablate well-ordered gratings in thin films. The period of the grating is determined by the incident wavelength (λ) and tilt angle (θ) of the sample with respect to normal incidence. In this manner we recorded various holographic nanopatterns onto transparent substrates, such as glasses and commercial contact lenses (Fig. 1). Using this quick, scale and economical method we produced several wearable contact lens sensors. 1,2 These contact lens based holographic sensors can be used for monitoring the eye curvature and pressure of glaucoma patients. The holograms can also be functionalized to sense glucose concentrations in the tears of diabetic patients. The findings have been reported in highly reputable journals 1,2 and have also received a lot of media attention. The approach was also extended into 3D patterning by ablating 3D assemblies of Ag nanoparticles within polymer media.3 Through laser ablation, ordered 3D geometries/patterns were written within the polymer layers. These reconfigurable geometries act as holographically recorded optical devices.

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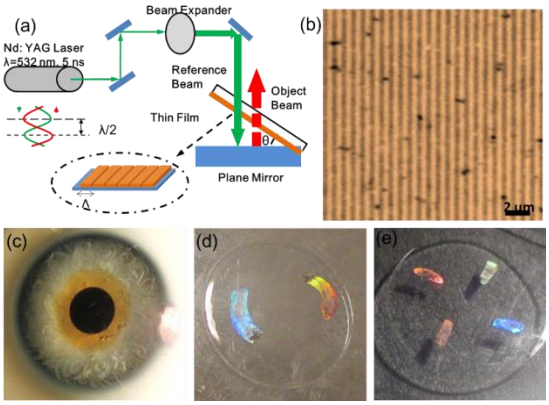

Figure 1: (a) Holographic laser ablation process, (b) the nonpatterns produced, (c-e) holograms

Biography

Dr. Haider has an extensive research background in the research areas of nanophotonics and healthcare technologies. He has published over 100 peer reviewed articles in prestigious journals including Nature Communications, Advanced Materials, Biotechnology Advances, Light Science and Applications and ACS Nano. His research work has received substantial recognition in the form of international awards, news media coverage and press interviews. His most pioneering works include glucose sensing contact lenses, contact lenses for color blind patients and carbon nanotube based holograms. Haider has over 10 years of teaching experience at institutes including Cambridge and Birmingham Universities.

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The Principles of Relativity and the Charge, Invariance of the Charge

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5- Mississisipi State University , Mississippi, USA. 6- Florida Atlantic University , Florida , U.S.A

Abstract

In this research , we investigate Energy of particles , by using the charge Q , rather than using the mass M of particles. That is , since the mass M of electrons can Decay Faster than the charge Q of the same electrons. So , in order , to be as prompt , as we can , in Technology , we have to be able to speak of Relativistic Power (Electric , Electronic , chemical , nuclear) in the Quantum Theory . It then becomes evident that one has to make sure to fulfill the requirements of the 1st Law of Thermodynamics and the Laws of Conservation of Energy in space in any chemical process electric process That is done and presented in this research by analyzing and further investigating with sufficient analysis the relationship between energy and charge in the 4- Dimensional Space – Time. The Albert Einstein relativistic forces and mechanics have been considered here in . So is the case for using the Relativistic Maxwell's equations the Lorentz Transformation and further the rules and regulations of Tensor Analysis and Differential Geometry in the Continuum 4 – D Space – Time . Moreover I have used the same coordinate systems and frames or similar frames which were used by A. Einstein. The invariance of the charge has been employed to show the proof of the validity of this analysis for any value of the charge Q .

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Biography

Tarek Nadim Mahmood Ibrahim Moaqat is a Computer Software Engineer registered as a member of the Institute of Engineering Technology , in the United Kingdom. He is a rnember of the IEEE Computer Society , in the U.S.A. Further , he is a graduate registered Master Degree Candidate at Arizona State University , in the U.S.A . That is at the Graduate College of Engineering , at Arizona State University. Further , Tarek N M Ibrahim Moaqat is a member of the IEEE Nano-Technology Council , and , other Councils , in the U.S.A. He is a researcher , and researches reviewer , evaluator , t the PUBLONS researches reviewers association.

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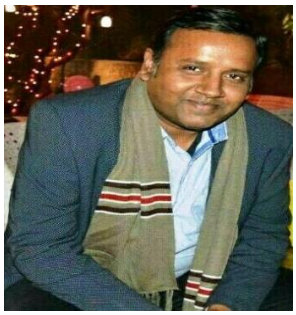

Biogenic Mediated Synthesis of Nanoparticles and Its Applications

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Gourav Mishra
Meerut Institute of Engineering and Technology (MIET), Meerut, Uttar Pradesh, India

Abstract

Nanotechnology is surfacing as one of the exciting fields for the researchers due to nano sized particles, their orientation, and physical attributes which has scientifically proven to enhance and modify the properties of other materials with which they interact. Their exclusive and exceptional attributes give them an upper hand when compared to other conventional macroscopic materials. For the synthesis of metal nanoparticles with specific shape and size, many processes have been carried out. To name a few, UV irradiation, laser ablation, photochemical reduction techniques, aerosol technologies, lithography and use of ultrasonic field techniques are common approaches for fabrication of nanoparticles. These techniques are less favourable these days because of their high cost and use of hazardous chemicals. Thus the urge to devise eco-friendly and reliable methods has developed across the world. Microorganism mediated biosynthesis of nanoparticles is one of the growing field as they are eco-friendly, less time consuming and free from the use of toxic chemicals as by-products. Till date, many research focussing on biological methods for extracellular and intracellular synthesis of nanoparticles have been reported utilising microorganisms such as bacteria, fungi, algae and yeast. Microorganisms mediated metallic nanoparticles synthesis is acquiring momentum because these processes can be carried out at ambient temperature, pressure and at neutral pH. Applications of metallic NPs are numerous, and there is strong potential for continued growth in this area. Nanoparticles are greatly used in medical fields, Industries related to cosmetics, coatings, fabrics, health/personal care products and environmental remediation processes. Vast and biodiverse nature of microbes with their unlimited, unexplored potential is yet to be fully understood in the field of nanoparticles synthesis. This review describes the biosynthesis of metallic nanoparticles and its applications in biotechnology, biochemical, biomedical and environmental and other fields.

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Keywords:

Nanoparticles; Biosynthesis; Microorganism.

Effect of Cobalt Catalyst Confinement in Carbon Nanotubes Support on Fischer-Tropsch Synthesis Performance

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Abstract

Pre-treating the multi-walled Carbon Nanotubes (CNTs) support by refluxing in 35 vol% nitric acid followed by heating at the temperature of 600 to 900 °C resulted in the formation of defects on the CNTs. Increasing the temperature of the pre-treatment of the CNTs from 600 °C to 900 °C, enhanced the fraction of cobalt-oxide nanoparticles encapsulated in the channels of CNTs from 31% to 70%. The performance of Co/CNTs in Fischer-Tropsch synthesis (FTS) was evaluated in a fixed-bed micro-reactor at a temperature of 240 °C and a pressure of 2.0 MPa. The highest CO conversion obtained over Co/CNTs.A.900 was 59% and it dropped by ~3% after 130 h of time-on-stream. However, maximum CO conversion using Co/CNTs.A.600 catalysts was 28% and it decreased rapidly by about 54% after 130 h of time-on-stream. These findings show that the combined acid and thermal pre-treatment of CNTs support at 900 °C has improved the stability and activity of the Co/CNTs catalyst in FTS.

Biography

Dr. Omid Akbarzadeh is working with Nanotechnology and Catalysis Research Centre since 2016. His main research area is heterogeneous catalysis and catalytic reaction engineering. He has spent 10 years in academic-industrial projects as a research officer and post-doctoral. Dr. Omid has worked 5 years in the oil and gas industry as a chemical engineer. He developed advance smart catalysts especially for oil and gas industries. Dr. Omid has contributed to two PETRONAS Research Sdn Bhd industrial catalyst projects and worked on international Airbus R&D project in NANOCAT. Currently, he is the PI of graphene catalyst project in Hokkaido University in Japan, project member of FRGS grant in UTP and assigned to the NANOCAT center project. Dr. Omid was the Chairman, keynote

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speaker and organizing committee of many international conferences. He is currently supervisor of three Ph.D. students from different countries. He has published many ISI papers; book chapters and has two approved and granted patents. Also, he has hands-on experience and passed several pieces of training on handling different types of equipment which are being widely used for material synthesis, characterization and performance evaluation. He is in close collaboration with other departments, government agencies and universities around the world. He is visiting researcher of Jiangsu University China and Hokkaido University Japan. He is member of the society of petroleum engineers (SPE) and Senior Member of Hong Kong Chemical, Biological & Environmental Engineering Society. Omid awarded full fellowship from UTP during Ph.D and were involved for lab demonstrator and teaching in the different courses of chemical engineering. He awarded Silver Medal in 27th International Invention & Innovation Exhibition (ITEX 2016), Kuala Lumpur Convention Center in Malaysia and Silver Medal of Post Graduate Research Project in 35th Science & Engineering Design Exhibition (SEDEX 35).

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Growth and study of Nanocarbon based Vacuum Nanoelectronic Emitters for Nano Satellite Propulsion

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Abstract

In the age of Internet of Things (IoT), enabled by Information and Communication Technology (ICT), small satellites area expected to play a major role as facilitator. The small satellites has further got a fillip on account of the advancement in the field of science and technology of field assisted electron emission which enables the propulsion of such small satellites. Especially the feasibility of nano carbon based, with high aspect ratio, self aligned structured, chemically stable, low power operating, miniaturization and improved life time, the Field Emission Electrical Propulsion (FEEP) has enhanced the interest in nano and pico satellites. Presented in this study is a brief overview of design, development and establishing of local capability for material and field emission device/array growth, characterization facility for emitters, design and development of arrays, to packaging and development of small satellites in an academic environment. In the age of IoT depending on who's predication one goes anything varying from 50 billion to 1 Trillion system are expected to be connected depending on varying predictions from CISCO to McKinsey in the next 10 to 20 years. For some of these to be possible small satellites would play a significant role. For extending the capability of small satellites be it pico or nano satellites FEEPs are expected to play a key role. The ability to grow nanocarbons in its various forms like carbon nanotubes, fullerene, graphene to room temperature grown nano carbons on patterned substrates or as self aligned structures has made field assisted electron emission arrays very attractive for a wide range application. The applications include field emission displays, large area electron-beam lithography, low & medium power microwave sources for communication, compact power electronic devices, Tera Hz devices, micro and pico satellite propulsion systems, wide range of sophisticated sensors, free electron lasers, x-ray source & imaging devices and bionic chips. The emergence of large area and flexible microelectronics has also given additional boost to developments in the care of vacuum nano electronics

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