magnus Group

2nd Edition of

Nanotechnology VIRTUAL 2020

October 29, 2020

"Theme:
Shaping the World Atom by Atom"

magnus Group

NANOTECHNOLOGY VIRTUAL 2020
BOOK OF ABSTRACTS

NANOTECHNOLOGY VIRTUAL 2020

OCTOBER 29, 2020

Theme:

Shaping the World Atom by Atom

INDEX

Contents	Pages
About The Host	4
Keynote Presentations	5
Plenary Talks	9
Oral Presentations	13
Poster Presentations	24
Participants List	28

About MAGNUS GROUP

Magnus Group (MG) is initiated to meet a need and to pursue collective goals of the scientific community specifically focusing in the field of Sciences, Engineering and technology to endorse exchanging of the ideas & knowledge which facilitate the collaboration between the scientists, academicians and researchers of same field or interdisciplinary research. Magnus group is proficient in organizing conferences, meetings, seminars and workshops with the ingenious and peerless speakers throughout the world providing you and your organization with broad range of networking opportunities to globalize your research and create your own identity. Our conference and workshops can be well titled as 'ocean of knowledge' where you can sail your boat and pick the pearls, leading the way for innovative research and strategies empowering the strength by overwhelming the complications associated with in the respective fields.

Participation from 90 different countries and 1090 different Universities have contributed to the success of our conferences. Our first International Conference was organized on Oncology and Radiology (ICOR) in Dubai, UAE. Our conferences usually run for 2-3 days completely covering Keynote & Oral sessions along with workshops and poster presentations. Our organization runs promptly with dedicated and proficient employees' managing different conferences throughout the world, without compromising service and quality.

About Nanotechnology Virtual 2020

Nanotechnology Virtual 2020 during **October 28-29, 2020** has been wrapped with multi-purpose tasks where sharing the knowledge is just not our aim, it also focuses on bringing everyone together with a familial atmosphere, where you can meet up the committed professional, professors, scientists and young scholars who shares the same area of importance, make the study allocation simple and suitable where each minute is entrenched with inspirational and joyful process.

magnus Group

KEYNOTE FORUM

SESSIONS ON:

NANOTECHNOLOGY

NANOTECHNOLOGY VIRTUAL 2020

October 29
2020

Zaneta Swiatkowska Warkocka

IFJ PAN, Poland

Role of solvent in composite particles formation during pulsed laser irradiation process

In the last decades, laser processing has become an important route for producing nanoparticles. Pulsed laser ablation method uses a focusing laser beam which can bring high energy density on small areas on target what leads to explosive particles formation. Using an unfocused laser beam for irradiation nanoparticles dispersed in liquid results in a completely different formation of particles. These irradiated particles were melt, merged resulting in a submicrometer spherical particles formation.

In this work taking metal oxides (α-Fe_2O_3, Fe_3O_4, CoO, NiO) particles as examples, we investigate and discuss the physical and chemical processes involved in particles formation by laser irradiation of nanoparticles dispersed in liquids. We will show the role of the solvent, and interaction not only between particles but also between particles and solvent molecules. The detailed discussion will be reported at the conference. We believe, that exploring the interactions between irradiated material and solvent molecules, and investigating the thermodynamic behavior of particles in various circumstances are needed to produce materials with specific structures and unique physical properties.

Biography

Ph.D. obtained in 2005 from Jagiellonian University. In the years 2008-2011 Scholarship holder of the Japan Society for the Promotion of Science at the National Institute of Advanced Industrial Science and Technology (AIST) in Tsukuba. Her research works are focus on the synthesis of composite materials and investigation of their properties.

RC Jagessar

Department of Chemistry, University of Guyana, Turkeyen Campus, Guyana, South America

Plant extracts based nanoparticles, potential nanomedicine in fight against COVID-19

There is no declared vaccine or specific medication/medications to date, to fight COVID-19, even though the first vaccine is expected to be out before December, 2020. However, plant based nanoparticles, may be one of the medical route that scientists can pursue to eradicate this planet threatening virus. The SARS-COV-2 virus consists of a structure of a similar scale as plant based nanoparticles. Its anticipated that the proposed plant based nanoparticles can attach to SARS COV-2 viruses, disrupting their structure and so kill the virus. Plant based nanoparticles are expected to disable the viruses, even before they break into the body.

Nanotechnology is the design, characterization, production/synthesis and application of structures, devices and systems by controlling the shape and size at the nanometer scale. Nanoparticles are usually synthesized by chemical methods that usually used toxic reactants/reagents as reducing agents that further produce toxic by-products, which in turn are hazardous to the environment. However, recently, there has been the used of plant extracts as an alternative, complementary source of reducing agents to reduce metal ions to the corresponding metal nanoparticles. Plants contain an abundance and diverse arrays of natural products such as alkaloids, flavonoids, saponins, steroids, tannins, coenzymes etc. that vary in concentration and type in different parts of the plants such as leaves, stems, roots, shoots, flowers, barks, fruits and seeds. These secondary metabolites can act as reducing and stabilizing agents for the bioreduction reaction to synthesize novel metallic nanoparticles. Plant based nanoparticles are less expensive to synthesise, ecofriendly and are thus less hazardous to the environment. This presentation on Green nanotechnology, surveys the use of plant extracts as possible green reagents for the synthesis of green nanoparticles to combat SARS-COV-2 virus

Keywords: Nanotechnology, nanoparticles, plant based nanoparticles, natural products, environmental friendly, medicinal, Covid-19, SARS-COV-2

Biography

Raymond C. Jagessar obtained his BSc (Distinction) in Chemistry/Biology from the University of Guyana (1992) and his PhD from the UK (1995). He held three Post Doctoral Research Fellowships at the University of South Carolina (USA), Wichita State University (USA) and the University of the West Indies (1996-1999). He has also won several international awards, amongst them are Chartered Chemist, CChem and Fellow of the Royal Society of Chemistry, FRSC, UK. His research interests are broad, covering the spectrum of Pure and Applied Chemistry, Chemical Biology, Pharmaceutical and Medicinal Chemistry. He has published over seventy (70) research articles, five book chapters and presented at several international conferences. He is currently Professor in Chemistry at the University of Guyana (South America).

Thomas J Webster

Art Zafiropoulo Chair, Department Chair, Chemical Engineering,
Northeastern University, Boston, MA USA

Hello implantable nanosensors: Goodbye old-fashion hospitals

There is an acute shortage of organs due to disease, trauma, congenital defects, and most importantly, age related maladies. While tissue engineering (and nanotechnology) has made great strides towards improving tissue growth, infection control has been largely forgotten. Critically, as a consequence, the Centers for Disease Control have predicted more deaths from antibiotic-resistant bacteria than all cancers combined by 2050. Moreover, there has been a lack of translation to real commercial products. This talk will summarize how nanotechnology with FDA approval can be used to increase tissue growth and decrease implant infection without using antibiotics. Studies will also be highlighted using nano sensors (while getting regulatory approval). Our group has shown that nanofeatures, nano-modifications, nanoparticles, and most importantly, nanosensors can reduce bacterial growth without using antibiotics. This talk will summarize techniques and efforts to create nanosensors for a wide range of medical and tissue engineering applications, particularly those that have received FDA approval and are currently being implanted in humans.

Biography

Thomas J. Webster's (H index: 88) degrees are in chemical engineering from the University of Pittsburgh (B.S., 1995) and in biomedical engineering from Rensselaer Polytechnic Institute (M.S., 1997; Ph.D., 2000). Prof. Webster has graduated/supervised over 189 visiting faculty, clinical fellows, post-doctoral students, and thesis completing B.S., M.S., and Ph.D. students. He is the founding editor-in-chief of the International Journal of Nanomedicine (pioneering the open-access format). Prof. Webster currently directs or co-directs several centers in the area of biomaterials: The Center for Natural and Tropical Biomaterials (Medellin, Colombia), The Center for Pico and Nanomedicine (Wenzhou China), and The International Materials Research Center (Soochow, China). He regularly appears on NBC, CNN, MSNBC, ABC News, National Geographic, Discovery Channel, and BBC News talking about science and medicine. He has received numerous honors and is current a fellow of AANM, AIMBE, BMES, NAI, IJN, FSBE, and RSM.

magnus Group

PLENARY

SESSIONS ON:

NANOTECHNOLOGY

NANOTECHNOLOGY VIRTUAL 2020

October 29
2020

Mubarak Ali M

[1]Assistant Professor, TKM College of Engineering, Kerala Technological University, Kerala, India

Application of nanomaterials as Spacecraft Shields

Impact events are classified into three: low velocity, high velocity or ballistic impact and hypervelocity impact. Hypervelocity impact damages occurs at the range of 5 to 20 km/s and it is a peculiar type of impact happening in space due to space debris (typical travel velocity 10 km/s) or meteorite/micrometeorite (typical velocity 20 km/s). Sandwich Composite panels and laminates are used in satellites for its specific strength and stiffness characteristics. Most dangerous characteristics of the hypervelocity impact event is the debris plume emanating from the rear face of the composite materials. The emanating particles will damage the neighbouring components and subsystems inside the satellite. If there are human beings in the space vessel as in International Space Station (ISS), then menace of hypervelocity impact will be substantial.

There are various sources of space debris in the space particularly in low earth orbits. The extend of the hypervelocity damage depends on size of the target material and size of the impactor. If the target material is thin and impactor is tiny object, the impactor will pierce the target and hole will be created in the target. If the target material is thick and impactor is tiny object, it will result in surface damages and degradation without punctured holes. If the impactor is large object, it will results in destruction of the target and orbital change. Destruction of the target will results in large numbers of space debris, which will magnify the risk of hypervelocity impact by acting as impactor. The ASAT (Anti Satellite Missile) launched by India during march 2019 have created 400 pieces of orbital debris and risk of orbital debris collision with ISS is estimated to be increased by 44% due to hypervelocity impact damage events.

The experimental simulation of hypervelocity impact damage events are highly challenging at earth. There have been experimental research in NASA and in ESA (European Space Research and Technology Centre, Netherlands). High velocity impact have been simulated using light gas gun in which particles of 1 cm size is propelled up to 8-9 km/s. To protect the Stardust probe from hypervelocity impact, NASA used a type of Whipple shield that consists of relatively thin outer shield, which is placed at a specific distance from the main spacecraft wall. Various shield configurations proposed to control the hypervelocity damage to space materials. International space station alone uses over 100 shield configurations with high-risk areas protected with better shielding.

This speech presents a review of growing risk of satellites due to space debris impact. The mechanism of mitigating the risk will also be discussed and challenges in future due to ever-increasing space debris/space junk will also be highlighted.

Biography

Dr. Mubarak Ali has pursued his Post-Doctoral Research in Satellite Research Centre, Nanyang Technological University, Singapore. His Post-Doctoral Research work was associated with Encapsulated Sandwich Composites for Thermal Coupling in Satellite Applications.

He has accomplished his Ph.D in School of Mechanical & Aerospace Engineering in Nanyang Technological University, Singapore with Nanyang Research Scholarship. His Ph.D research work dealt with Impact Damage and Scarf Repair of Laminated Composites with Dispersed Core/Shell Thermoplastic Particles. His Ph.D Supervisor was Associate Professor Sunil C Joshi.

He has completed his M.S. (by Research) in IIT Madras, in Department of Metallurgical and Materials Engineering. His M.S. Research dealt with Fretting Wear and Fretting Fatigue Analysis of Plasma Nitrided Ti-6Al-4V & AISI 304 Stainless Steel for Aerospace Application. His M.S. Research Supervisor was Professor Ganesh Sundara Raman, Department of Metallurgical and Materials Engineering, IIT Madras.

He holds a B.Tech Degree in Production Engineering from Madras Institute of Technology (MIT), Anna University Campus, Chennai. His

Final Year Undergraduate Research Project involved Vibration Analysis of Microsatellite Satellite Structure, which forms a part of early stage analysis of ANUSAT Satellite program. ANUSAT was an Ambitious Indian Student Research Microsatellite, which was designed, developed & integrated at Department of Aerospace Engineering, Madras Institute of Technology (MIT), Chrompet, Anna University during 2002-2009. ANUSAT Satellite

His Biography has been listed in MARQUIS WHO'S WHO IN THE WORLD, 2014, 31st Edition, VIP Number: 36728040.

He is currently working as Assistant Professor in Mechanical Engineering, in TKM College of Engineering, a prestigious institution in south India, affliated to Kerala Technological University.

TKM College of Engineering has signed a MoU with Universiti Teknologi Malaysia (UTM) during May 2019. Dr. Mubarak Ali is in close contact with Dr. Shukur Abu Hassan of CACM (Centre for Advanced Composite Materials) UTM, Johor Bahru, and Dr. Normah Binti Mohd Gazali, Professor in Dept. of Thermofluids, Faculty of Mechanical Engineering, Universiti Teknologi Malaysia (UTM), Johor Bahru.

S Ginil Mon[1]*, Y. Jaya Vinse Ruban[2], D. Vetha Roy[3]

[1]Department of Chemistry & Research, Nesamony Memorial Christian College, Marthandam, India
[2]Department of Chemistry & Research, St. Xaviers College (Autonomous), Palayamkottai, Tirunelveli, India
[3]Polymer Nanocomposite Centre, Department of Chemistry & Research, Scott Christian College (Autonomous), Nagercoil, Tamilnadu, India

Cellulose based nanomaterials: The future of material science from natural products

Bio-nanomaterials have been a revelation in the field of nanotechnology giving a pollution free option for most of the applications. Imitation of the nature paves way for most of the modern inventions. So too the biopolymers and bio-nanomaterials which are showing encouraging signs for the future of material science. Cellulose being a vastly available bio-polymer and having the provision of modification, it provides room for usage in many fields.

Cellulose was extracted from coconut husk by soda pulp method and modified to cellulose acetate by acetylation. Cellulose nano-crystals were synthesized by acid-hydrolysis method. Structural elucidation is done by FT-IR analysis and their thermal properties were studied by TGA/DTA analysis. TEM images confirm the nano-crystals to be in nano-scale.

Biography:

Ginil Mon (37 yrs.) a chemist who has specialized in Polymer Chemistry got his doctorate for his thesis "Thermal And Mechanical Characteristics of Novel Peroxide-Cured Ethylene Propylene Diene Terpolymer-Neoprene Composite Films with Clay/Graphite Fillers" from the Manonmaniam Sundaranar University. His paper presented in Indraprastha International Conclave on Nano Science and Technology, New Delhi during November 16-17, 2010 was adjudged the best. He has ten publications to his credit with total impact factor 13.464, 75 citations, h-index 4 and i10-index 4. An International Resource Person in diverse topics including Environment and ICT, he is working in Nanotechnology, Polymer Nanocomposites, Spectroscopy and Molecular Docking. A fellow of Indian Science Congress, member of editorial board for journals, he is also reviewer in five international journals which includes Elsevier journals too. Being an organizing committee member of many international conferences notably in Sanyo, China and Singapore, he has been an invited speaker in eight national and four international conferences including one at Singapore. Currently he is teaching in the Department of Chemistry and Research, Nesamony Memorial Christian College, Marthandam near Cape Commorin.

magnus Group

SPEAKERS

SESSIONS ON:

NANOTECHNOLOGY

NANOTECHNOLOGY VIRTUAL 2020

OCTOBER 29
2020

RC Jagessar[1], S Hope[2], S Issacs[2], Y Crepaul[2]

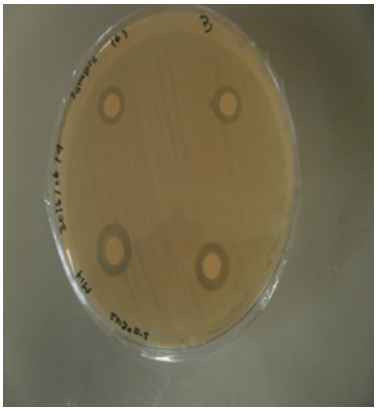
[1]Department of Chemistry, University of Guyana, Turkeyen Campus, Guyana, South America

[2]Department of Biology, University of Guyana, Turkeyen Campus, Guyana, South America

Antimicrobial activity of the Ethanolic and Aqueous extract of *Vicia faba L.* (Fabaceae) in the absence and presence of zinc nanoparticles

The aqueous and ethanolic extract of *Vicia faba L.* (Fabaceae) exhibited antimicrobial activity against the pathogenic microorganisms: *E. coli, S. aureus, K. pneumoniae and C. albicans*. This was evaluated using the Disc Diffusion Assay under asceptic conditions. Antimicrobial activity wasn't induced by the solvent, ethanol nor water as the DZOI was less than 5 mm. The highest AZOI was 153.9 mm^2 and the lowest 12.56 mm^2. Negligible Zone of Inhibition, ZOI were observed in several instances. The aqueous extract of the fruit also induced negligible Zone of Inhibition, ZOI. In comparison to the reference, Ampicillin and Nystatin, these values are less. As the concentration of the metal salt, $Zn(OAc)_2.2H_2O$ and ethanolic extract increases, there seem to be a variation in antimicrobial activity. $Zn(OAc)_2.2H_2O$ appears to intensify the antimicrobial activity of *Vicia faba L* ethanolic and aqueous extract. Zn $(OAc)_2.2H_2O$ in the absence of any extracts exhibited antimicrobial activity. The AZOI range from 47.2 mm^2 to 117.8 mm^2. Antimicrobial selectivity was also observed in several instances. For example, the ethanolic extract induces AZOI of 50 mm^2 against C. albicans whereas negligible AZOI was obtained against K. *pneumoniae* and *E.coli.* Its presume that zinc nanoparticles are involved in the intensification of the antimicrobial activity of the plant extracts

Keywords: Antimicrobial activity, pathogenic microorganisms, Disc Diffusion Assay, Area of Zone of Inhibition, Zone of Inhibition, Zn $(OAc)_2.2H_2O$.



Biography:

Raymond C. Jagessar obtained his BSc (Distinction) in Chemistry/Biology from the University of Guyana (1992) and his PhD from the UK (1995). He held three Post Doctoral Research Fellowships at the University of South Carolina (USA), Wichita State University (USA) and the University of the West Indies (1996-1999). He has also won several international awards, amongst them are Chartered Chemist, CChem and Fellow of the Royal Society of Chemistry, FRSC, UK. His research interests are broad, covering the spectrum of Pure and Applied Chemistry, Chemical Biology, Pharmaceutical and Medicinal Chemistry. He has published over seventy (70) research articles, five book chapters and presented at several international conferences. He is currently Professor in Chemistry at the University of Guyana (South America).

Tooba Mahboob
UCSI University, Malaysia

Role of Nanotechnology in COVID-19

The deployment of advanced therapeutic options is urgent required in this current pandemic caused by novel coronavirus disease 2019 (COVID-19). The role of nanotechnology could play a vital role to counter this "virus" nano enemy. Nanotechnology has previously been used in developing antiviral and other biological therapeutics successfully. This technique could be used to develop novel antiviral drug as well as vaccine and other health care applications against this coronavirus. This strategy directs the safe and effective delivery of therapeutic options utilizing engineered nanocarriers, blocking interactions of viral protein with host cell and disruption of virus. A number of pre-clinical studies on metallic and liposomal nanoparticles targeting different virus including HIV, Hepatitis, H1N1, Zika, coronavirus are currently in progress.

Adeleke Abdulrahman Oyekanmi
Universiti Sains Malaysia, Malaysia

Characterization and optimization of batch adsorption study of pollutants parameters of POME using synthesized adsorbent media

Palm oil mill effluent (POME) is a high strength agro-allied wastewater containing both organic pollutants and heavy metals. The discharge of POME into the environment without adequate treatment contributes to diseases affecting humans and aquatic lives. However, there is the necessity to reduce the pollutants to a very low level of discharge to reduce the impact of the toxic effect of the pollutants on the environment and the aquatic population. The conventional approach for the treatment of POME is expensive compared to the method of adsorption. The method of adsorption has shown to be cost and time effective for research. Thus, the objective of this study was to prepare composite adsorbent from activated coconut shell carbon (ACSC), activated cow bone powder (ACBP) and zeolite for the treatment of POME using the optimum particle size obtained in a batch adsorption study. The characterization of the ACSC, ACBP and zeolite was obtained using pendant drop contact angle experiment. The result illustrated that the contact angles of the ACSC, ACBP and zeolite respectively were 105.20^{o}, 95.70^{o} and 25. 20^{o}. The result of the contact angles showed that activated coconut shell carbon and activated cow bone powder were hydrophobic materials while the zeolite was hydrophilic. The investigation of the chemical composition of the materials using energy dispersive x-ray (EDX) indicated that the major elements of both ACSC and ACBP were predominantly C, Ca^{2+} and O and Si for zeolite and C, Si, O, Na, Mg, Ca and P as the major elements on the surface of the composite while the XRF showed that the composite contained CaO and SiO_2 as the major compounds.

The optimal batch adsorption of COD and NH3-N was obtained at under fixed condition of pH 7, 105 minutes contact time at 150 rpm shaking speed and 150 μm particle size for ACSC, ACBP and zeolite. The prepared composite adsorbent contained functional groups of CH, C=C, C-O-C, OH using the Fourier transform irradiation (FT-IR) analysis. The optimal operation parameters of the adsorption process for the reduction of COD and NH3-N using the central composite design (RSM) was recorded at pH 10, 50 rpm of shaking speed for 2 h and by using 3 mm of composite particle size and 125 gL-1 of the adsorbent at initial concentration of POME of 1 ml per 500 ml volumetric flask. The results revealed that the investigated factors evidently induced the reduction of the parameters.

Biography:

Dr. Adeleke Abdulrahman Oyekanmi is a research fellow at the School of Industrial technology, Universiti Sains Malaysia. His core expertise are in water and wastewater management by creating sustainable treatment technologies. He is a researcher of repute with vast experiences in environmental management, pollution analysis, modelling and optimization of process variables for enhanced operational system. His expertise includes water quality assessment and prediction of surface and sub-surface storm water pollution using geographical information systems, modelling of water quality parameters, wastewater treatments and solid wastes management. His works on new processes development, mathematical modelling and optimization are well documented in reputable international journals in the web of sciences.
His works have earned him numerous laurels and awards some of which include the winner of a silver medal in 2015 (Best Paper Research), silver medal in 2016 (Innovative Product Research) organized by the Office of Research, Innovation and Commercialization and Consultancy Service (ORICC), Universiti Tun Hussein Onn Malaysia, He is a gold medallist (Environmental and Renewable Energy Category) at the 27th International Invention and Technology Exhibition (ITEX Malaysia) in 2016 and also a gold medal recipient at the Seoul International Invention Fair (SIFF South Korea).

He is also a regular reviewer for high impact factor journals among which are Bioresource Technology, Journal of Cleaner Production, Journal of Water Processing Engineering, Journal of Chemical and Biotechnology, Journal of Oil Palm Research, Journal of soil and sediment, Heliyon. He is the recipient of the grand price as 'the outstanding reviewer of the month' of November 2018 for the Journal of Cleaner Production.

He is an accomplished team player and a technocrat with problem solving skills and excellent service delivery across projects in environmental, civil and water engineering chain with the overriding aim of making impactful contribution towards ensuring safe, secured and sustainable environment.

Beddiaf Zaidi
Associate Professor, Department of Physics, University of Batna 1, Batna, Algeria

Effect of optical windows on the efficiency of CdS/MoS2 solar cells

In this work, we investigated the effect of windows layer utilizing Zinc Oxide (ZnO) or Lead Oxide (PbO) antireflective thin film (ARC) on the characteristics of CdS/MoS2 Heterojunction solar cell (current density (Jsc) short circuit, open circuit voltage (VCO), power-voltage (P-V) and capacitance-voltage (C-V)). All these options are implemented in the one-dimensional numerical simulation program SCAPS.

Biography:

Dr. Zaidi working as Associate Professor in Dept of Physics at the University of Batna 1. He obtained a doctorate in Physics at the University of Annaba in 2014. He has published a number of research papers in reputed journals, has written three books on solar cells. He acted as an Editor-in-Chief of IJMSA (From 2017 to 2018). He is a potential reviewer for reputed journal papers. He participated in many international conferences serving as a referee, PC member... etc. He is also an Editorial Board member of numerous journals.

Pranshu K. Gupta, Lallan Mishra*

Institute of Science, Department of Chemistry, Center of Advanced Study, Banaras Hindu University, Varanasi, UP, India

Study of Highly Fluorescent Carbon Quantum Dots derived from *Swertia chirata*

Nanotechnology have reached to every dimension of science and Quantum Dots. Green synthesis of carbon quantum dots (CQDs) help in attaining quantum mechanical properties in an affordable and optimizable way among synthetic routes of CQDs through chemical/biological carbon precursors. The CQDs have been applied to photo-sensing of organic molecules, metal ions, and biological materials like hemoglobin, RNA, cancerous cells etc, photo catalysis, photo degradation and Photodynamic studies. We have planned synthesis of CQDs through pyrolysis of pharmaceutically relevant Swertia chirata plant powder. The quantum confinement effect, 2.46 eV photo excitable band gap, and 27.8% fluorescence quantum yield of aqueous 6.25 mg L-1 CQDs were confirmed using absorption-emission spectroscopy. X-ray diffraction and FTIR studies reveal the multiphasic nature of pyrolytic products confirming the presence of nano graphite, graphene oxide, carbon nanotube and fullerene-like systems. Porous non-crystalline, fullerene-like CQDs were extracted from these pyrolytic products and its particle size was found to be 8.63 nm. Tauc and Williamson-Hall plots were stimulated using FORTRAN programming. Quantum mechanical Brus-Kayanuma equation confirms 34% of quantum confinement with effective e/h mass of 0.053m$_e$ and correlates the synthesized CQDs with N, S-doped lower fullerenes. Semi qualitative sunlight-induced photo degradation studies were performed using CQDs against methylene blue dye revealing complete photo degradation within 1 hour at room temperature after 30 min dark phase of adsorption. Studies confirmed high application of CQDs exhibiting its wider scope in future.

Biography:

Pranshu Kumar Gupta, after being B.Sc. (Hons.) gold medalist, is currently pursuing M.Sc. in Chemistry (Inorganic) and is working as a post-graduate project student under the supervision of Prof. (Distin.) Lallan Mishra at Department of Chemistry (CAS), Institute of Science, Banaras Hindu University (BHU), Varanasi, UP, India. He has worked as Indian Academy of Sciences (2018) and JNCASR (2019) summer research fellow at IISc Bangalore and IISER TVM, under supervision of Dr. Mrinmoy De and Prof. (Bhatt. Awardee.) K. George Thomas, respectively. His research interests are computational green-nanochemistry, lattice induced chiral inversion, eco-friendly metal nanoparticle, carbon quantum-dot synthesis: metal/bio-stabilizer induced bioactivity, surface-enhanced catalysis and confinement-controlled photochemistry.

Weam Sidahmed Awadalla Sidahmed
University of Khartoum, Khartoum, Sudan

Material Science and engineering for Nanoparticles

This research aims to study an effect of annealing nanosize titanium dioxide (TiO_2), Titanium dioxide (TiO_2) is a wide gap oxide semiconductor is an n-type due to oxygen deficiency. It has three phases of the crystal structures including anatase, brookite, and rutile, where the band gap is 3.2 eV for brookite, 3.2 eV for anatase, and 3.0 eV for rutile. The most stable form and the principal source of (TiO_2) are rutile. The metastable anatase and brookite will transform to the thermodynamically stable rutile upon calcination at temperatures exceeding 600°C.

In all three forms, titanium (TiO_4) atoms are coordinated to six oxygen (O_2) atoms, forming (TiO_6) octahedra.

Utilize six grams of (TiO_2) material beige color was tope down divided for two parts one was annealed to 600°C for 4 hours and another let without annealing.

The as-prepared samples were further characterized using devices studying (TiO_2) properties, X-Ray Diffraction (XRD), Fourier Transformation Infrared Red (FTIR) and USB Spectrometer.

As 0.25g from both samples was taken and put in (FTIR) to reading transmission and absorption properties, 0.5g was taken for two samples put in (XRD), and 0.25g from both samples was taken and used UV-Visible Spectroscopy (USB) to take the readings.

After the properties of the annealed sample were studied and compared to the raw (control powder), this properties were found that the color of the Titanium Dioxide has changed from beige into white as the last one showed fewer impurities and formed Ti-O-Ti vibrational mood which was absent in the control sample.

The band gap was recorded and found to be 2.567 eV and 2.568 eV for control and annealed samples respectively.

Biography:

Weam Sidahmed is an independent researcher who received her M.Sc. in Renewable Energy at the University of Khartoum, and studying M.Sc. in Business Administration in second semester at University of Khartoum, and B.Sc. Faculty of Science Department of Physics (Mathematical Section). Her work experience includes research and teaching posts in the Sudan since 2016, she teaches at several Sudanese higher education institutions and serves for NGOs in Sudan. She is a conferences organizer, presenter and proceedings editor, and is engaged in collaborative research with global and social perspectives. She is a committee member and from team founding of Next Einstein Forum in Sudan and organized conference the Sudanese Women in Science and organized (2018-219) Sudan Robotic Camp for kids (2018-219), team member of Sudan Youth Organization on Climate Change. I attended many local and global conference about nanotechnology.

Abbaraju krishna sailaja
RBVRR Women's College of Pharmacy, India

Preparation and characterization of sulfasalazine loaded polymeric nanoparticles by solvent evaporation and salting out techniques

Sulfasalazine is used in the treatment for inflammatory bowel disease, Rheumatoid arthritis and Ankylosing spondylitis. It is chemically 2-hydroxy-5-[(E)-2-{4-[(pyridin-2yl) sulfamoyl]phenyl}diazen-1-yl] benzoic acid. The anti inflammatory activity of Sulfasalazine may rely on inhibition of the transcription factor NFkB. But the poor physico chemical parameters, low aqueous solubility, less oral bioavailability (15%) are responsible for its decreased biological activity. It is available as tablets, film coated and enteric coated tablets.

Nanoparticles have shown significant advancements in delivery of drugs and biomolecules. The primary objective of the study was to develop and characterize sulfasalazine polymeric nanoparticles (SZNPs). SZNPs were prepared by solvent evaporation method and salting out techniques by changing the drug : polymer ratio and stabilizers.

In Solvent evaporation technique, ethyl cellulose (EC) and eudragit S100 (ED) were used as polymers due to its less size and sustained release properties. Tween 20 was used as stabilizer. For each polymer five formulations were prepared by varying the concentration of drug and polymer. The obtained particles were characterised for Particle Size, Zeta potential, Scanning electron microscopy and FTIR. Out of five formulations of Ethylcellulose(EC),F2 formulation was showing promising results with a mean particle diameter of 188. 1nm and zeta potential value of 62. 7mV. Among all formulations of eudragit S100 (ED), F3 formulation was showing lower particle size of 207nm and greater stability with a zeta potential value of -59. 5mV. Comparative study was performed between F2 formulation of EC and F3 formulation of ED to determine the best formulation. Ethyl cellulose was found to be the best polymer for the preparation SZNPs for solvent evaporation technique.

In Salting out technique EC and ED were used as polymers, sodium carboxy methyl cellulose as a colloidal stabilizer and zinc sulfate as a salting out agent. For each polymer five formulations were prepared by varying the concentration of drug and polymer. The obtained particles were characterized for particle size, zeta potential, scanning electron microscopy and FTIR. Out of five formulations of EC, F3 formulation was showing promising results with a mean particle diameter of 211nm and zeta potential value of - 45. 7mV. Among all formulations of ED,F3 formulation was showing lower particle size of 245nm and greater stability with a zeta potential value of -43. 2mV. Comparative study was performed between F3 formulation of EC and F3 formulation of ED to determine the best formulation. Ethyl cellulose was found to be the best polymer for the preparation SZNPs by salting out technique.

Comparative study was performed among the best formulations of solvent evaporation and salting out techniques. The results were found to be best for solvent evaporation technique with lesser particle size, greater stability and controlled drug release properties.

Keywords: Sulfasalazine, Entrapment Efficiency, Loading Capacity, Particle Size

Seongwoo Woo
Addis Ababa Science & Technology University, Ethiopia

Reliability Design of Mechanical Systems Subjected to Repetitive Stresses

The basic reliability concepts - parametric ALT plan, failure mechanism and design, acceleration factor, and sample size equation were used in the development of a parametric accelerated life testing method to assess the reliability quantitative test specifications (RQ) of mechanical systems subjected to repetitive stresses. To calculate the acceleration factor of the mechanical system, a generalized life-stress failure model with a new effort concept was derived and recommended. The new sample size equation with the acceleration factor also enabled the parametric ALT to quickly evaluate the expected lifetime. This new parametric ALT should help an engineer uncover the design parameters affecting reliability during the design process of the mechanical system. Consequently, it should help companies improve product reliability and avoid recalls due to the product failures in the field. As the improper design parameters in the design phase are experimentally identified by this new reliability design method, the mechanical system should improve in reliability as measured by the increase in lifetime, LB, and the reduction in failure rate, λ

Biography:

Dr Woo has a BS and MS in Mechanical Engineering, and he has obtained PhD in Mechanical Engineering from Texas A&M. He major in energy system such as HVAC and its heat transfer, optimal design and control of refrigerator, reliability design of thermal components, and failure Analysis of thermal components in marketplace using the Non-destructive such as SEM & XRAY. In 1992.03–1997 he worked in Agency for Defense Development, Chinhae, South Korea, where he has researcher in charge of Development of Naval weapon System. He was working as a Senior Reliability Engineer in Refrigerator Division, Digital Appliance, SAMSUNG Electronics.

G Pellicane*[1,3], GT Mola[1], M Tsige[2]

[1]University of Kwazulu-Natal, School of Chemistry and Physics, King Edward Avenue, Scottsville Pietermaritzburg, South Africa

[2]University of Akron Department of Polymer Science, Goodyear Polymer Center, Akron Ohio, U.S.A

[3]Universita' degli studi di Messina, BIOMORF, Azienda Ospedaliera Universitaria Policlinico, Messina, Italy

Nano-structuring of polymer blends at the interface driven by topology

Physical techniques for surface modification of plastics use surface-active agents, which can self-assemble at the surface. Many techniques, which are important in modern technologies, use polymer blends, and there is considerable interest to understand the extent the composition of the surface layer differs from that in the bulk for molten polymer mixtures. Dynamical and structural properties of polymers in the melt state are strongly influenced by molecular architecture and blending polymers with different molecular topologies could be potentially exploited to control interfacial segregation of the polymer film, and to achieve optimal mechanical properties of the plastic material. However, a deep understanding of the role of chain architecture and molecular mass in determining which species preferentially adsorb at a given interface is lacking. Experiments to resolve the matter are typically conducted by mixing polymers possessing the same repeat chemistry, but different molecular architecture. Here we show the results obtained in large-scale molecular dynamics simulations of linear-cyclic polymer films, and we find clear evidence of enhancement of linear polymers at the interface, in agreement with recent experimental results. The behavior predicted by the self-consistent field theory (SCF), i.e., enhancement of cyclic polymers at the interface, emerges for relatively long chains. In our presentation, we provide a picture of the microscopic mechanisms through which the chain length arbitrates the competition between the different packing constraints imposed by the loop and linear geometry of the two polymers. We also discuss the role of enthalpic and entropic factors of the interfacial free energy of the system in determining which species in the blend preferentially adsorbs at the interface.

Biography:

Dr Pellicane is an Assistant Professor in the BIOMORF department, at the University of Messina (Italy) and a honorary Associate Professor in the School of Chemistry and Physics, at the University of Kwazulu-Natal (South Africa), where he has been working since 2011 before moving to Italy. He is the author of more than 60 peer-reviewed articles indexed in the web of Science – core collection database. His field of expertise is the theory and computer simulation of simple/complex fluids.

magnus Group

POSTERS

SESSIONS ON:

NANOTECHNOLOGY

NANOTECHNOLOGY VIRTUAL 2020

October 29
2020

Ananya Bhatheja[1], Udit Kumar[2], Sudipta Seal[2]*

[1]Lake Highland Preparatory School
[2]Advanced Materials Processing and Analysis Center, Nanoscience Technology Center, Dept. of Materials Science and Engineering, University of Central Florida, Orlando, FL

Ceria infused nano silk fibre patch fabrication and Applications

An increased emergence of antimicrobial resistance to oral antibiotics has necessitated a greater need for locally delivered and tissue specific solutions. Wound care solutions in the form of medicated patches offer a potential for cheaper, more sustainable, and biocompatible engineered solutions to combat this issue. The objective is to synthesize and test ceria infused silk fibroin patches to determine their efficacy in antimicrobial use. The silk fibroin is derived from Bombyx mori cocoons and is a widely used protein polymer due to its strength, porousness, and maximized surface area. Ceria nanoparticles are added to this solution as they possess antimicrobial properties due to their ability to produce regenerative oxygen species. First, the control and Ceria silk solutions are synthesized. The final patch is then formed by electrospinning, which uses an electrostatic potential difference to draw nano-fibers. Its antimicrobial activity should be enhanced as we are combining the biocompatibility and durability of the silk with the catalytic and antioxidant properties of Ceria. The silk patch was successfully formed with a tightly packed structure, small nanoparticle size, high stability, and ideal absorbance. This patch can be used in treating infected wounds in a more effective manner, potentially eliminating side effects of oral antibiotics.

Alexander V Frolov
Independent Researcher, Russian Federation

Active Force Material

Goal of this project is to create new profitable Holding Corporation for innovation of advanced propulsion technology into aerospace and other transport industry. The technology is based on new nanomaterial.

The idea of this international nanotech project came to Alexander Frolov in 2016 after his research laboratory Faraday Ltd. company was closed in Russia. It was 15 years research activity in many directions of advanced propulsion and new energy sources. The nanotech project cannot be developed in Russia due to limited facilities of nanotech and microelectronic industry. It is planned to create new company in other country where is high tech microelectronics industry, for example, production of computer processors, or advanced nanotech labs in area of surface nanoengineering.

Nataliya Pryadko and Gennadiy Strelnikov
Department of Thermogasdynamic of Energy Plant, Institute of Technical Mechanics of National Academy of Science of Ukraine, Dnipro, Ukraine

Producing nanomaterials by jet grinding with acoustic process control

The properties of powders for many industries greatly depend on their dispersion and the absence of impurities. Jet grinding of bulk materials, being a complex energy-intensive process, allows obtaining high-quality fine powders without any impurities from grinding media. This is important for getting new materials for radio electronics, medicine, and the food industry. The novelty of the proposed methods and technologies consists in the highly dynamic particle disintegration during the complex and thermal effects of flows. This allows achieving high thermomechanical activation effects with a significant increase in the product quality based on different nano-powders obtained from waste production of metallurgical and concentration plants. Waste recycling can increase the degree of raw material utilization, improve the ecology of the environment, expand the mining and metallurgical enterprise infrastructure by converting waste into materials for construction and obtaining concentrates from difficult enriching products.

To increase mill productivity, the grinding process is maintained in an optimal mode based on the use of new information technologies, in particular, according to the results of process acoustic monitoring. A technique based on the connections between the material dispersion and the acoustic signals of the grinding and classification zone is developed to control operation modes and the size of the ready product in the stream. This allows you to determine the quality of the ready ground product on-time without stopping the grinding process.

Biography:

Dr. Nataliya Pryadko, is a leading researcher in the Department of Thermogasdynamic of Energy Plant of Institute of Technical Mechanics of NASU, Ukraine. She has worked in the field of mineral processing and nanotechnology of jet grinding for 14 years. She has authored for more than 150 publications and holds 15 issued patents. Dr Genadiy Strelnikov is a professor and director of the Department of Thermogasdynamic of Energy Plant of Institute of Technical Mechanics of NASU, Ukraine. He has worked in the field of rocket engine technology for 40 years. He has authored for more than 160 publications and holds 25 issued patents. Currently, he is the Scientific Leader for three major research projects from the National Academy of Science of Ukraine; the research group is focused on the development of various ground nanomaterial applications and modification of jet grinding technology.

PARTICIPANTS LIST

Name	P No.
Abbaraju krishna sailaja RBVRR Women's College of Pharmacy, India	21
Adeleke Abdulrahman Oyekanmi Universiti Sains Malaysia, Malaysia	16
Alexander V Frolov Independent Researcher, Russian Federation	26
Ananya Bhatheja University of Central Florida, Orlando	25
Beddiaf Zaidi Associate Professor, Department of Physics, University of Batna 1, Batna, Algeria	18
G Pellicane Universita' degli studi di Messina, BIOMORF, Azienda Ospedaliera Universitaria Policlinico, Messina, Italy	23
Mubarak Ali M TKM College of Engineering, Kerala Technological University, Kerala, India	10
Nataliya Pryadko Institute of Technical Mechanics of National Academy of Science of Ukraine, Ukraine	27
Pranshu K. Gupta Banaras Hindu University, India	19
RC Jagessar Department of Chemistry, University of Guyana, Turkeyen Campus, Guyana, South America	7
RC Jagessar University of Guyana, South America	14
S Ginil Mon Nesamony Memorial Christian College, India	12
Seongwoo Woo Addis Ababa Science & Technology University, Ethiopia	22

PARTICIPANTS LIST

Thomas J Webster Northeastern University, Boston, MA USA	8
Tooba Mahboob UCSI University, Malaysia	15
Weam Sidahmed Awadalla Sidahmed University of Khartoum, Khartoum, Sudan	20
Zaneta Swiatkowska Warkocka IFJ PAN, Poland	6

Questions? Contact

+1 (702) 988-2320 or Inquires:

https://www.magnuswebinars.com/nanotechnology-virtual/contact

For Registration:

https://www.magnuswebinars.com/nanotechnology-virtual/register