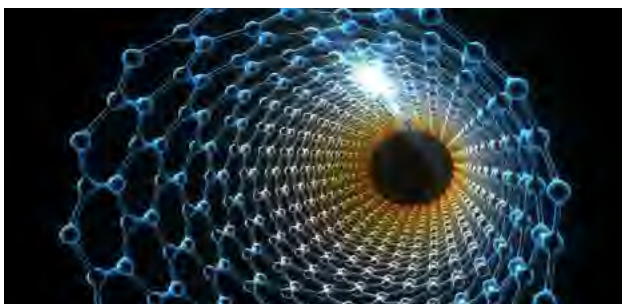
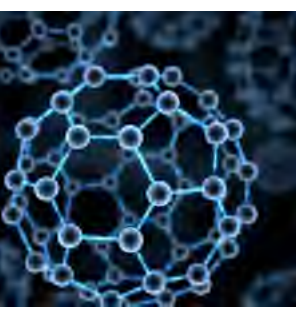
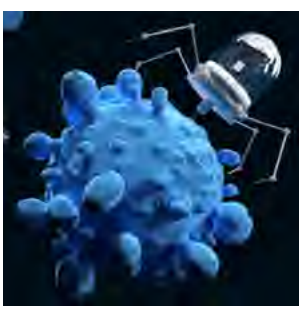
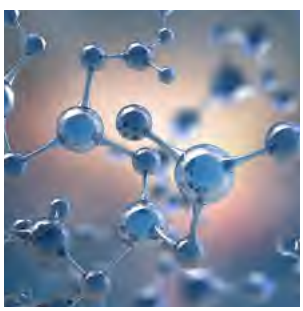
Scientific Tracks & Sessions
May 06-07, 2022

Nanoscience 2022

25th International Conference on
ADVANCED NANOSCIENCE AND NANOTECHNOLOGY
May 06-07, 2022 | Webinar

Chair: MOHAMMED AL-ABRI | Sultan Qaboos University | Oman

Session Introduction

Title: Long-term maintenance of human pluripotent stem Cells in defined media using recombinant protein
Julee Kim | Seoul National University | South Korea

Title: Nanoparticles future in energy and mass transportation field
Waqar Ahmed | Malaysia Japan International Institute of Technology (MJIIT) | Malaysia

Title: Title : Electrochemical performance of transition metal sulfide by employing different synthesis techniques for hybrid batteries
Umer Aziz | GIK Institute of Engineering Sciences and Technology | Pakistan

Title: Toxic effect of iron oxide nanoparticles, silver nanoparticles and their mixture on heart, brain and lung of male rats
Abdelsalam Abuzreda | Benghazi University | Libya

Title: Metal oxides nano-size and polymers added MWCNTs for hydrocarbons and dyes removal from water
Thamer Adnan Abdullah | University of Pannonia | Hungary

Title: Structural evolution and correlation with thermoelectric properties in various materials
Norbert M Nemes | Universidad Complutense de Madrid | Spain

Title: Graphene coatings - A disruptive approach for mitigation of corrosion
Raman Singh | Monash University | Australia

Title: Sustainable development in the energy and environment due to involvement of nanotechnology.
Sawan Graak | Kurukshetra University | India

Title: Synthesis, characterization and biological activities of meso-tetraphenylporphyrin Schiff bases
Mian Gul Sayed | University of Swat | Pakistan

Title: Nanotechnology role in the long-term sustainability of water resources
Ahmed Mohamed Hesham | Suez Canal University | Egypt

Title: Synthesis and characterization V2O5/SiO2 nano catalyst
Ali AlnazaaAlhamad | Aleppo University | Syria

Title: Thin-film (FTO/BaTiO3/AgNPs) for enhanced piezo-photocatalytic degradation of methylene blue and ciprofloxacin in wastewater.
Daniel Masekala | University of Johannesburg | South Africa

Title: Hepatotoxicity by paracetamol and role of curcumin nanoparticles antioxidants as protective agents
Abdelsalam Abuzreda | Benghazi University | Libya

25th International Conference on
ADVANCED NANOSCIENCE AND NANOTECHNOLOGY
May 06-07, 2022 | Webinar

Received date: 02-04-2022 | Accepted date: 06-04-2022 | Published date: 24-05-2022

Long-term maintenance of human pluripotent stem cells in defined media using recombinant protein

Julee Kim
Seoul National University, South Korea

Conventional human pluripotent stem cell (hPSC) cultures require high concentrations of expensive human fibroblast growth factor 2 (hFGF-2) for hPSC self-renewal and pluripotency in defined media for long-term culture. The hPSC culture media need to be changed every day partly due to the hFGF-2 thermal instability in solution at 37°C. It has been known that the binding site of human DJ-1 (hDJ-1), also known as PARK-7 is FGF receptor-1. In the present study, for the first time, we have demonstrated that recombinant protein human FGF-2 can replace hDJ-1 in the essential eight media to maintain the pluripotency of H9 human embryonic stem cells (hESCs) under feeder-free conditions. After more than ten passages, H9 hESCs cultured with human FGF-2 or human DJ-1 successfully sustained the distinctive hESC morphology. Furthermore, H9 hESCs revealed high expression levels of pluripotency markers including SSEA4, Tra1-60, Oct4, Nanog, and Alkaline phosphatase. DNA microarray revealed that more than 97% of the 21,448 tested genes, including the pluripotency markers, Sox2, Nanog, Klf4, Lin28A, Lin28B, and c-Myc, have similar mRNA levels between the two groups. Karyotyping revealed no chromosome abnormalities in both groups. They also differentiated sufficiently into three germ layers by forming in vitro embryoid bodies and in vivo teratomas. There was the moderate difference in H9 hESCs in both groups was shown in the real-time PCR assay using several pluripotency markers and three germ layer markers. The proliferation rate measured at different concentrations of growth factors and the structural analysis of mitochondria using transmission electron microscopy demonstrated the distinguishable feature of H9 hESCs in two groups, namely hFGF2 and hDJ-1. On the whole, in-house-made recombinant protein hDJ-1 can maintain the self-renewal and the pluripotency of H9 hESCs in a feeder-free system for the long term without alteration of their characteristics.

Recent Publications

1. Kim J, et.al. (2021), DJ-1 Can Replace FGF-2 for Long-Term Culture of Human Pluripotent Stem Cells in Defined Media and Feeder-Free Condition, Int J Mol Sci 22(11):5954

2. Kim J, et.al.(2021), Prokaryotic soluble overexpression and purification of oncostatin M using a fusion approach and genetically engineered E. coli strains, Int J Mol Sci;22(11):5954.

Biography

Julee Kim received her diploma degree in Biotechnology at the Westfaelisch Wilhelms University of Muenster in 2007. She graduated from the Westfaelisch Wilhelms University of Muenster with a Ph.D. degree in Biology at the Max Planck Institute for Molecular Biomedicine in 2013. She completed her post-doctoral training at the University of California San Francisco and at Columbia University, Irving Cancer Research Center. She worked as a research assistant professor at the University of Ulsan College of Medicine, Asan Medical Center, and as a research professor at CHA University. Currently, she is a senior researcher at the Seoul National University College of Medicine. She has 8 publications in international journals. She presented papers at more than 10 national and international conferences.

juleekim119@gmail.com

25th International Conference on
ADVANCED NANOSCIENCE AND NANOTECHNOLOGY
May 06-07, 2022 | Webinar

Received date: 05-12-2022 | Accepted date: 06-12-2022 | Published date: 24-05-2022

Nanoparticles future in energy and mass transportation field

Waqar Ahmed
Malaysia Japan International Institute of Technology (MJIIT), Malaysia

Since the last few eras, numerous studies have been conducted on nanofluids research containing metal oxides, Graphene, carbon-based, and their composites/hybrid are rapidly growing in the energy-saving field. Outmoded varying heat exchanging fluids with the addition of nanoparticles sized (<100 nm) freely suspended in them are called nanofluids. Nanofluids proved their enhanced heat transfer properties as compared to conventional fluids, despite numerous inconsistencies in outcomes by different researchers. The fundamental objective to do this comprehensive research is to optimize the synthesis techniques of nanoparticles, preparation methods for nanofluids, and detailed applications in the area of the Heat exchanger, Energy, and Mass Transfer, and Heat convection with enhanced thermo physical properties. The five different nanoparticle synthesis techniques are presenting a hereafter-detailed literature review. Additionally, a brief study about preparation methods for nanofluids and their echo-friendly functionalization is also a major focus of this study. Different applications of metal oxide, carbon-based and hybrid nanofluids with their thermos-physical properties are presented here. The detailed review on synthesis and preparation of nanofluids along with thermo physical properties comprises the positive effects of different nanofluids for enhanced energy transportation in different heat different heat exchangers.

Recent Publications

1. Ahmed, W., Kazi, S. N., Chowdhury, Z. Z., Johan, M. R. B., Mehmood, S., Soudagar, M. E. M., ... & Ahmad, M. S. (2021). Heat transfer growth of sonochemically synthesized novel mixed metal oxide ZnO+ Al2O3+ TiO2/DW based ternary hybrid nanofluids in a square flow conduit. Renewable and Sustainable Energy Reviews, 145, 111025.
2. Ahmed, W., Kazi, S. N., Chowdhury, Z. Z., Johan, M. R. B., Mehmood, S., Soudagar, M. E. M., ... & Ahmad, M. S. (2021). Experimental study on well Dispersed and Stable New ZnO-EG@DW Nanofluids for enhanced energy transportation in a Square Heat Exchanger; Renewable and Sustainable Energy Review
3. Ahmed, W., Chowdhury, Z. Z., Kazi, S. N., Johan, M. R. B., Abdelrazek, A. H., Fayaz, H., ... & Khan, T. Y. (2021). Experimental evaluation and numerical verification of enhanced heat transportation by using ultrasonic assisted nanofluids in a closed horizontal circular passage. Case Studies in Thermal Engineering, 26, 101026.
4. Ahmed, W., Chowdhury, Z. Z., Kazi, S. N., Johan, M. R., Akram, N., & Oon, C. S. (2020). Effect of ZnO-water based nanofluids from sonochemical synthesis method on heat transfer in a circular flow passage. International Communications in Heat and Mass Transfer, 114, 104591.
5. Ahmed, W., Kazi, S. N., Chowdhury, Z. Z., Johan, M. R. B., Soudagar, M. E. M., Mujtaba, M. A., ... & Kamangar, S. (2020). Ultrasonic assisted new Al2O3@ TiO2-ZnO/DW ternary composites nanofluids for enhanced energy transportation in a closed horizontal circular flow passage. International Communications in Heat and Mass Transfer, 105018

Biography

Waqar Ahmed has done his Ph.D. degree in Material Physics from the University of Malaya world QS ranking 65. As a Ph.D. researcher at the Institute for advanced studies at the University of Malaya, he has led his research activities to synthesize the metal oxides, graphene, carbon nanotubes, and their binary and ternary composite for energy-related varying applications like (Energy storage, sensors, energy transportation, Heat, and Mass Transfer, Heating and cooling of Electrical and electronic systems, which helps in solidified of his interest in the area of materials and nanofluids. These experiences have reinforced his research interest in material that inspired a career in synthesis and applications of nanomaterials.

waqarum.ah@gmail.com

25th International Conference on
ADVANCED NANOSCIENCE AND NANOTECHNOLOGY
May 06-07, 2022 | Webinar

Received date: 02-04-2022 | Accepted date: 06-04-2022 | Published date: 24-05-2022

Electrochemical performance of transition metal sulfide by employing different synthesis techniques for hybrid batteries

Umer Aziz, Muhammad Zahir Iqbal
GIK Institute of Engineering Sciences and Technology, Pakistan

Hybrid batteries have gained peculiar attention in the energy storage domain. However, they still lack to accommodate high specific energy (Es) and power density (Ps) demands. Therefore, the performance enhancement of supercapacitors by utilizing various electrode materials with superior electrochemical activities is desired. Herein, we have studied various manganese-based nanomaterials for hybrid battery applications. Initially, we synthesized manganese sulfide (MnS) via a sonochemical approach and later synthesized it through the hydrothermal method. The structural, morphological, and elemental studies were performed by X-ray diffraction (XRD), scanning electron microscopy (SEM), and energy-dispersive X-ray spectroscopy (EDX). At first, the electrochemical characteristics of MnS materials were studied in both three and two-electrode setups. The electrode with superior outcomes in three-electrode cells was studied further as a positive electrode with activated carbon (AC) in the ASC device. The S2//AC ASC displayed enhanced energy of 62.5 Wh kg-1 at a power of 1700 W/kg (2 A/g). Besides, the device obtained high power of 5950 W/kg and achieved an energy of 10.13 Wh kg-1. Furthermore, a simulation approach was scrutinized to verify the capacitive and diffusive contributions. The results obtained predict strontium sulfides to be efficient materials for asymmetric supercapacitor applications.

Recent Publications

1. Muhammad Zahir Iqbal, Umer Aziz (2022): Supercapattery: Merging of battery-supercapacitor electrodes for hybrid energy storage devices. Journal of Energy Storage. Elsevier Publishing Company. 46, 103823, 2022

Biography

Umer Aziz graduated from Islamia College University, Peshawar with a field of interest in Physics, and material science. He is currently expertise in Applied Physics at Ghulam Ishaq Khan Institute, Pakistan. Umer's past research has focused on Lead-free piezoelectric ceramics and currently studying different nanomaterials for hybrid supercapacitors applications. He is currently interested in perusing his Ph.D. In the area of batteries and supercapacitors. After completion of the program, Umer aspires to work as a researcher in the industry.

umeraziz60@gmail.com

25th International Conference on
ADVANCED NANOSCIENCE AND NANOTECHNOLOGY
May 06-07, 2022 | Webinar

Received date: 26-04-2022 | Accepted date: 29-04-2022 | Published date: 24-05-2022

Toxic effect of iron oxide nanoparticles, silver nanoparticles and their mixture on heart, brain and lung of male rats

Abdelsalam Abuzreda
Benghazi University, Libya

Humans are exposed to nanoparticles (NPs) from ambient air and certain workplaces. The data on the potential health hazards of NPs exposure is limited. From the literature, there is not enough data on cardiotoxicity, neurotoxicity, and lung toxicity induced by the co-exposure to iron oxide nanoparticles (Fe2O3NPs) with silver nanoparticles (AgNPs). Therefore, the present study aimed to investigate the toxic effect of Fe2O3NPs, AgNPs alone or in combination on the brain, heart, and lungs of male rats. Animals were divided into 4 equal groups. Group 1 served as control, group 2 was administered orally with Fe2O3NPs (5 mg/kg BW; >50 nm), group 3 was treated intraperitoneally with AgNPs (50 mg/kg BW; >100 nm) and group 4 was administered with the mixture of Fe2O3NPs plus AgNPs. Animals were treated every day for 79 days. The present results showed that at the molecular level Fe2O3NPs, AgNPs, and their mixture showed marked DNA fragmentation as a hallmark of cell death. At the gene expression level Fe2O3NPs, AgNPs, and their mixture showed significant suppression of the mitochondrial transcription factor A (mtTFA) gene, while showing significant induction of peroxisome proliferator activator receptor gamma-coactivator 1α (PGC-1α) gene. Both genes; mtTFA and PGC-1α are involved in the regulation of mitochondrial biogenesis and function. Fe2O3NPs, AgNPs, and their mixture caused a significant decrease in final body weight, body weight gain, serotonin, dopamine, acetylcholine esterase, paraoxonase 1, antioxidant enzymes (GST, SOD, CAT, and GPX), total antioxidant capacity, and reduced glutathione in brain, heart, lung, and plasma. Whereas, Fe2O3NPs, AgNPs, and their mixture resulted in a significant increase in norepinphrineiron, acetylcholine, creatine kinase, thiobarbituric acid-reactive substances, nitric oxide, tumor suppressor gene p53, tumor necrosis factor-α, interliukin-6, and lipid profiles. Fe2O3NPs, AgNPs, and their mixture showed histology changes alteration in the brain, heart, and lung. In conclusion, the obtained data showed that Fe2O3NPs, and AgNPs alone and in combination induced neurotoxicity, cardiotoxicity, and lung toxicity. The toxic effects of the combination of Fe2O3NPs with AgNPs were more pronounced than each one.

Keywords: Iron oxide nanoparticles; Silver nanoparticles: Male rats; Oxidative stress; Antioxidants; cardiotoxicity, neurotoxicity, and lung toxicity, Cytokines; Mitochondrial transcription factor A peroxisome proliferator activator receptor gamma-coactivator 1α, Biochemical and histology changes.

Recent Publications

1. Mosa IF, Abd HH, Abuzreda A, Yousif AB, Assaf N. (2021) Chitosan and curcumin nanoformulations against potential cardiac risks associated with hydroxyapatite nanoparticles in Wistar male rats. International Journal of Biomaterials. Jul 29;2021
2. Yousif AB, Mosa IF, Abd HH, Abuzreda A, Assaf N,.(2020) Bioevaluation of the role of chitosan and curcumin nanoparticles in ameliorating genotoxicity and inflammatory responses in rats' gastric tissue followed hydroxyapatite nanoparticles' oral uptake. Toxicology Research. Jul;9(4):493-508.
3. Yousef MI, Abuzreda AA, Kamel MA, (2019). Cardiotoxicity and lung toxicity in male rats induced by long-term exposure to iron oxide and silver nanoparticles. Experimental and therapeutic medicine. Dec 1;18(6):4329-39.
4. Yousef MI, Abuzreda AA, Kamel MA (2019). Neurotoxicity and inflammation induced by individual and combined exposure to iron oxide nanoparticles and silver nanoparticles. Journal of Taibah University for Science. Dec 11;13(1):570-8.

Biography

Abdelsalam Abuzreda is a Ph.D. graduate in Nanotoxicity on Molecular and Physiological Characteristics and he is the Assistant Professor and Postdoctoral Research fellow at Benghazi University. Currently, he is a researcher in the Department of Health Safety and Environmental (HSE), Arabian Gulf Oil Company (AGOCO). He has contributed to various conferences and many publications in his research interests such as Material Characterization, Nanoparticle Synthesis, Nanoparticle Preparation, Nanomaterials Synthesis, Nanomaterials, Nanoscience, Nanostructured Materials, Nanobiotechnology, Polymers, and Biomaterials.

Bozrida@yahoo.com

25th International Conference on
ADVANCED NANOSCIENCE AND NANOTECHNOLOGY
May 06-07, 2022 | Webinar

Received date: 17-11-2021 | Accepted date: 17-11-2021 | Published date: 24-05-2022

Metal oxides nano-size and polymers added MWCNTs for hydrocarbons and dyes removal from water

Thamer Adnan Abdullah[1,2], Tatjana Juzsakova[1], Ali D. Salman[1], Rashed T. Rasheed[2], Balázs Zsirka[1], Sebestyen Viktor[1]

[1] University of Pannonia, Hungary
[2] University of Technology, Baghdad

The increasing population around the world increases the demand for fossil fuels which led to an increased probability of oil shipping accidents and oil spill possibilities. Discharge of byproducts of dyes production industries into water sources, make the biggest challenges for researchers to produce cost-effective processes and environmentally friendly water treatment. In this work, different polymers and metal oxides nanosize were added to MWCNTs and applied for hydrocarbons (kerosene cut and toluene) and dye removal from water. Firstly MWCNTs were oxidized using strong acids. Then different polymers: polyethylene (PE) and poly-N-isopropylacrylamide-co-butylacrylate (P-NIPAM) were added to Fe/MWCNTs for kerosene and toluene removal from water. The physio-sonication method was used for the preparation of nanocomposites. In another hand, our group also modified other nano sorbents (metal oxides nanocomposites like V2O5, CeO2, and their nanocomposites were added to MWCNTs for kerosene and dyes removal from water).

In order to confirm the adsorption behavior of the kerosene/toluene, three kinetic models were applied including the pseudo-first-order, the pseudo-second-order, and the Intra particle diffusion model is commonly known as the weber morris kinetic model was applied. While Langmuir and Freundlich's isotherm models were used to calculate the isotherm constants. The fresh and modified MWCNTs were characterized using XRD, SEM, TEM, EDX, FTIR, Raman, TGA and BET. Polymers nanocomposites and metal oxides nanosize modified MWCNTs were greatly increased the removal efficiency and sorption capacity for parent MWCNTs towards hydrocarbons and dyes removal from water.

The increasing population around the world increases the demand for fossil fuels which led to an increased probability of oil shipping accidents and oil spill possibilities. Discharge of byproducts of dyes production industries into water sources, make the biggest challenges for researchers to produce cost-effective processes and environmentally friendly water treatment. In this work, different polymers and metal oxides nanosize were added to MWCNTs and applied for hydrocarbons (kerosene cut and toluene) and dye removal from water. Firstly MWCNTs were oxidized using strong acids. Then different polymers: polyethylene (PE) and poly-N-isopropylacrylamide-co-butylacrylate (P-NIPAM) were added to Fe/MWCNTs for kerosene and toluene removal from water. The physio-sonication method was used for the preparation of nanocomposites. In another hand, our group also modified other nano sorbents (metal oxides nanocomposites like V2O5, CeO2, and their nanocomposites were added to MWCNTs for kerosene and dyes removal from water).

In order to confirm the adsorption behavior of the kerosene/toluene, three kinetic models were applied including the pseudo-first-order, the pseudo-second-order, and the Intra particle diffusion model is commonly known as the weber morris kinetic model was applied. While Langmuir and Freundlich's isotherm models were used to calculate the isotherm constants. The fresh and modified MWCNTs were characterized using XRD, SEM, TEM, EDX, FTIR, Raman, TGA and BET. Polymers nanocomposites and metal oxides nanosize modified MWCNTs were greatly increased the removal efficiency and sorption capacity for parent MWCNTs towards hydrocarbons and dyes removal from water.

Recent Publications

1. Abdullah TA, Juzsakova T, Rasheed RT, Mallah MA, Salman AD, Cuong LP, Jakab M, Zsirka B, Kułacz K, Sebestyén (2022), V. V2O5, CeO2 and Their MWCNTs Nanocomposites Modified for the Removal of Kerosene from Water. Nanomaterials; 12(2):189. https://doi.org/10.3390/nano12020189

2. Abdullah, T. A., Juzsakova, T., Rasheed, R. T., Salman, A. D., Adelikhah, M., & Cretescu, I. (2021). V2O5 Nanoparticles for Dyes Removal from Water. http://dx.doi.org/10.19261/cjm.2021.911

3. Abdullah, T. A., Juzsakova, T., Mansoor, H., Salman, A. D., Rasheed, R. T., Hafad, S. A., & Nguyen, D. D. (2022). Polyethylene over magnetite-multiwalled carbon nanotubes for kerosene removal from water. Chemosphere, 287, 132310. https://doi.org/10.1016/j.

chemosphere.2021.132310

4. Abdullah, Thamer A., Tatjána Juzsakova, Rashed T. Rasheed, Ali D. Salman, Viktor Sebestyen, Endre Domokos, Brindusa Sluser, and Igor Cretescu. (2021). "Polystyrene-Fe3O4-MWCNTs Nanocomposites for Toluene Removal from Water" Materials 14, no. 19: 5503. https://doi.org/10.3390/ma14195503

Biography

Thamer Adnan Abdullah completed his Master of Chemical Engineering from Guru Gobined Singh Indraprastha University New Delhi., in 2012. he is working as an assistant lecturer in the University of Technology, Baghdad, in the Applied Science Department, Chemistry Branch Group. Currently, he is a Ph.D. researcher in the Sustainability Solutions Research Lab, Faculty of Engineering, University of Pannonia, Veszprem, Hungary. He has several articles published in ScienceDirect reputed journals and has participated in many international conferences in the field of environmental chemistry and nano-research.

thamer.abdullah@mk.uni-pannon.hu

25th International Conference on
ADVANCED NANOSCIENCE AND NANOTECHNOLOGY
May 06-07, 2022 | Webinar

Received date: 17-04-2022 | Accepted date: 21-04-2022 | Published date: 24-05-2022

Structural evolution and correlation with thermoelectric properties in various materials

Norbert M. Nemes
Universidad Complutense de Madrid, Spain

A good thermoelectric material must have a high Seebeck coefficient (S), be a good electrical conductor, and be a good thermal insulator. The efficiency of a thermoelectric is commonly characterized by its thermoelectric figure of merit, zT=σS2T/κ. Thermoelectrics could play an important role in saving energy in the future, sustainable, economy, if only they had a zT>4. Today, the best materials, commercial highly doped semiconductors, do not exceed by much zT ~ 1, while state-of-the-art zT reported very recently in materials such as SnSe, GeTe or skutterudites do not exceed zT ~ 2.5. The electrical (σ) and thermal (κ) conductivity in metals is tied by the Wiedemann-Franz law. However, κ also has an important contribution in semiconductors due to the vibrations of the crystal lattice. There are several strategies pursued to improve thermoelectric properties, including the so-called "phonon glass, electric crystal" (PGEC) with great prominence. It is based on decreasing κlatt in different ways while preserving the good electronic properties (S and σ).

We use several, far from equilibrium, synthesis methods to obtain thermoelectric materials with promising properties. We characterize the static and dynamic structure with neutron scattering and synchrotron X-ray diffraction, with Rietveld refinement analysis to obtain both the crystalline structure and the dynamics of the constituent atoms through thermal factors (atomic displacement parameters).

We correlate this structure with the thermoelectric properties, in particular with the contribution of the crystalline network to the thermal conductivity in families of materials of SnSe and its alloys with various metallic elements, alloys of Bi2Te3 with Sb and Se, and skutterudites of CoSb3 filled with rare earth and alkali or alkaline earth atoms. In this talk several results of these material families will be described, always aiming to establish correlations between the structural peculiarities with the observed properties.

Recent Publications

1. Norbert M Nemes, Javier Gainza, Federico Serrano-Sánchez, João EFS Rodrigues, Yves Huttel, Oscar J Dura, Michael M Koza, María Teresa Fernández-Díaz, Juan J Meléndez, Bence G Márkus, Ferenc Simon, José Luis Martínez, José Antonio Alonso, (2020)"High-Performance n-type SnSe Thermoelectric Polycrystal Prepared by Arc-Melting",Cell Reports Physical Science (12) 100263
2. Norbert M Nemes,Javier Gainza, Federico Serrano-Sánchez, João E Rodrigues, Jesús Prado-Gonjal, Neven Biskup, Oscar J Dura, José L Martínez, François Fauth, José A Alonso,(2020), "Unveiling the Correlation between the Crystalline Structure of M-Filled CoSb3 (M = Y, K, Sr) Skutterudites and Their Thermoelectric Transport Properties" Advanced Functional Materials 30 (36) 2001651
3. Norbert M Nemes, Bálint Náfrádi, Péter Szirmai, Massimo Spina, Andrea Pisoni, Xavier Mettan,, László Forró, Endre Horváth (2020) "Tuning ferromagnetism at room temperature by visible light" Proceedings of the National Academy of Sciences 117 (12) 6417-6423
4. .Norbert M Nemes, Mirko Rocci, Dhavala Suri, Akashdeep Kamra, Gilvânia Vilela, Yota Takamura,Jose L Martinez, Mar Garcia Hernandez, Jagadeesh S Moodera (2020) "Large enhancement of critical current in superconducting devices by gate voltage" Nanoletters 21 (1) 216-221
5. Norbert Marcell Nemes,Tamás Veres, Constantinos Voniatis, Kristóf Molnár, Dániel Nesztor, Daniella Fehér, Andrea Ferencz, Iván Gresits, György Thuróczy, Bence Gábor Márkus, Ferenc Simon, Mar García-Hernández, Lilla Reiniger, Ildikó Horváth, Domokos Máthé, Krisztián Szigeti, Etelka Tombácz, Angela Jedlovszky-Hajdu (2022) "An Implantable Magneto-Responsive Poly (aspartamide) Based Electrospun Scaffold for Hyperthermia Treatment" Nanomaterials 12 (9) 1476

Biography

Norbert M. Nemes is an experimental solid-state physicist who obtained his Ph.D. in Physics from the University of Pennsylvania in 2002 after postdoctoral stays in the NIST Center for Neutron Research and also the Materials Science Institute of Madrid he is a Professor of Applied Physics at the Universidad Complutense de Madrid, one of the largest and oldest Spanish universities. He has published over 100 research papers with an h-index of 22 on topics ranging from materials of reduced dimensions, superconductors, spintronics, and magnetic anisotropy, multifunctional materials (magnetoelectric coupling), and in the last years on thermoelectrics.

nmnemes@ucm.es

25th International Conference on
ADVANCED NANOSCIENCE AND NANOTECHNOLOGY
May 06-07, 2022 | Webinar

Received date: 25-04-2022 | Accepted date: 26-04-2022 | Published date: 24-05-2022

Graphene coatings - A disruptive approach for mitigation of corrosion

Raman Singh
Monash University, Australia

Corrosion and its mitigation costs dearly (any developed economy loses 3-4% of GDP due to corrosion, which translates to ~$250b to annual loss USA). In spite of traditional approaches to corrosion mitigation (e.g., the use of corrosion resistance alloys such as stainless steel and coatings), loss of infrastructure due to corrosion continues to be a vexing problem. So, it is technologically as well as commercially attractive to explore disruptive approaches for durable corrosion resistance. Graphene has triggered unprecedented research excitement for its exceptional characteristics. The most relevant properties of graphene as a corrosion resistance barrier are its remarkable chemical inertness, impermeability, and toughness, i.e., the requirements of an ideal surface barrier coating for corrosion resistance. However, the extent of corrosion resistance has been found to vary considerably in different studies. The author's group has demonstrated an ultra-thin graphene coating to improve the corrosion resistance of copper by two orders of magnitude in an aggressive chloride solution (i.e., similar to sea water). In contrast, other reports suggest the graphene coating actually enhances the corrosion rate of copper, particularly during extended exposures. The author's group has investigated the reasons for such contrast in corrosion resistance due to graphene coating as reported by different researchers. On the basis of the findings, the author's group has succeeded in demonstrating of durable corrosion resistance as a result of the development of suitable graphene coating. The presentation will also assess the challenges in developing corrosion-resistant graphene coating on most common engineering alloys, such as mild steel, and present results demonstrating circumvention of these challenges.

Keywords: Iron oxide nanoparticles; Silver nanoparticles: Male rats; Oxidative stress; Antioxidants; cardiotoxicity, neurotoxicity, and lung toxicity, Cytokines; Mitochondrial transcription factor A peroxisome proliferator activator receptor gamma-coactivator 1α, Biochemical and histology changes.

Recent Publications

1. S. Al-Saadi, R.K. Singh Raman, M.R. Anisur, S. Ahmed, J. Crosswell, M. Alnuwaiser, C. Panter,(2021), Graphene Coating on a Nickel-Copper Alloy (Monel 400) for Microbial Corrosion Resistance: Electrochemical and Surface Characterizations, Corrosion Science, 182 109299.
2. A. Sanjid, M.R. Anisur, R.K. Singh Raman, (2019), Durable Degradation Resistance of Graphene Coated Nickel and Monel-400 as Bi-polar Plates for Proton Exchange Membrane Fuel Cell, Carbon, 151 68-75
3. Anisur, M.R., et al., (2018) Controlling hydrogen environment and cooling during CVD graphene growth on nickel for improved corrosion resistance. Carbon, 127, 131-140.
4. RKS Raman, Z Wang, XL Zhao, G Xian, G Wu, S Al-Saadi, A Haque,(2017), Long-term durability of basalt-and glass-fibre reinforced polymer (BFRP/GFRP) bars in seawater and sea sand concrete environment, Construction and Building Materials 139 , 467-489

Biography

Raman Singh is a professor at Monash University and his research interests include Alloy Nano/Microstructure-Corrosion Relationship, Stress Corrosion Cracking (SCC), Corrosion/SCC of Biomaterials, Corrosion Mitigation by Novel Material (e.g., Graphene), Advanced and Environmentally Friendly Coatings, High-Temperature Corrosion. He has supervised 50 Ph.D. students. He has published over 250 peer-reviewed international journal publications, 15 books/book chapters, and over 100 reviewed conference publications. His professional responsibilities include editor-in-chief of two journals, Fellow ASM International and Engineers Australia, over 40 keynote/plenary talks at international conferences (besides numerous invited talks), leadership (as chairperson) of a few international conferences.

raman.singh@monash.edu

25th International Conference on
ADVANCED NANOSCIENCE AND NANOTECHNOLOGY
May 06-07, 2022 | Webinar

Received date: 05-12-2021 | Accepted date: 07-12-2021 | Published date: 24-05-2022

Sustainable development in the Energy and environment due to involvement of Nanotechnology

Sawan Graak, Madhu Yadav
Kurukshetra University, India

Nanotechnology is the engineering that works on the molecular scale. Nanotechnology is improving rapidly and improving human life in many aspects. We are witnesses to the growth of Nanotechnology in the past two decades. Nanotechnology plays a key role in many sectors whereas Energy and Environment are also part of it. Energy and Environment are the two important keys to sustainable living. In the current scenario, the world is looking for the window that can help us in reducing the wastage of energy and reduction in pollutants. In the Environment, Nanotechnology is used in waste management Air Pollution, Water and Wastewater Treatment, and Nanomaterials safety. However, In the case of Energy, Nanotechnology is used in environment-friendly Clean energy, energy production, power transmission, Storage of energy and conversion, Thermal Insulation, and Solar Power.

Biography

Sawan Graak, has completed his M.Tech. in Energy and Environmental Management from Kurukshetra University, Kurukshetra, India. Currently, he is working as an Environment Executive in World Bank Funded Project. He has done various projects in Material Science during his M.Sc. Physics on the topic of As deposited Microstructure of Spray Formed Al-6Si-10Pb Alloys andonthetopic of "Study of heat stress on rabi crop production in Haryana using remote sensing" in Remote Sensing during MTech, from Indian Institute of Technology, Roorkee, India.

graaksawan@gmail.com

25th International Conference on
ADVANCED NANOSCIENCE AND NANOTECHNOLOGY
May 06-07, 2022 | Webinar

Received date: 29-11-2021 | Accepted date: 15-12-2021 | Published date: 24-05-2022

Synthesis, characterization, and biological activities of meso-tetraphenylPorphyrin Schiff bases

Mian Gul Sayed, Fazal Mabood
University of Swat, Pakistan

Novel porphyrin Schiff bases were synthesized by a simple Schiff base condensation in refluxing 5-(4-aminophenyl)-10,15,20-triphenylporphyrin (ATTP) between 2,3 dimethoxybenzaldehyde and 2,3,4-trimethoxybenzaldehyde. The newly synthesized porphyrin Schiff bases were characterized on the basis of their chemical properties and spectral data. the synthesized compounds showed analgesic, anti-inflammatory, and antibacterial activities.

Biography

Mian Gul Sayed completed his Ph.D. at the University of Malakand, KP Pakistan, in collaboration with the University of Leuven Belgium. He is an assistant professor at the Institute of the Chemical Sciences University of Swat, Swat, KP, Pakistan. He has participated in various conferences and conventions.

mian@uswat.edu.pk

25th International Conference on
ADVANCED NANOSCIENCE AND NANOTECHNOLOGY
May 06-07, 2022 | Webinar

Received date: 25-04-2022 | Accepted date: 26-04-2022 | Published date: 24-05-2022

Nanotechnology role in the long-term sustainability of water resources

Ahmed Mohamed Hesham[1], Rafat Moustafa[2]

[1] Suez Canal University, Egypt

[2] Al-Azhar University, Egypt.

Today's scientific problems in industrial wastewater treatment and drinking water treatment are enormous. The scientific community has been challenged to move toward newer breakthroughs and technologies as part of a global strategy for environmental conservation and ecological biodiversity. Our focus is on nanotechnology in environmental engineering, and future trends in water and wastewater treatment. Because water is necessary for life. Freshwater makes up only 2.5 percent of the total amount of water on the planet. Also, many people die because of a lack of clean and safe drinking water than because of conflict, terrorism, or weapons of mass destruction. Water contamination is growing increasingly complex and harder to eliminate as the world's population grows. Many regions of the world are confronting multiple issues in providing a sustainable supply of water because of global climate change, and the size of these challenges is fast increasing. As a result, wastewater reuse is becoming increasingly widespread. Treatment of polluted wastewater is necessary for healthy living due to the presence of water contaminants such as heavy metals, organic pollutants, and a variety of other complex substances. Nanotechnology has the potential to create efficient, cost-effective, and environmentally sustainable solutions for providing clean water and drinkable water for human consumption. Various methods of water purification, such as sedimentation, filtering, and chemical or biological degradation, are incapable of destroying new contaminants. As a result, nanotechnology-based devices hold promise in the treatment of water and wastewater. The rapid and continuous advancements in nanotechnology tools hold a lot of promise for future water quality concerns. Our work briefly discusses nanotechnology's recent advancements and uses in wastewater treatment. Numerous creative ways for creating nanoparticles and subsequently using them for wastewater treatment are discussed. These techniques range from the development of nanomaterial-based membranes to the use of catalysts to break down harmful chemicals.

Recent Publications

1. Fawzy, M., Hasham,A., Houta, M. H., Hasham, M., Helmy, Y. A. (2021): COVID-19: Risk assessment and mitigation measures in healthcare and non-healthcare workplaces. Ger. J. Microbiol. 1 (2): 19-28.
2. Fawzy, M., Khairy, G. M., Hesham, A., Rabaan, A. A., El-Shamy, A. G., & Nagy, A. (2021): Nanoparticles as a novel and promising antiviral platform in veterinary medicine. Archives of Virology, 166(10), 2673-2682.
3. Hesham, A., Awad, Y., Jahin, H., El-Korashy, S., Maher, S., Kalil, H., & Khairy, G. (2021). Hydrochar for Industrial Wastewater Treatment: An Overview on its Advantages and Applications. J Environ Anal Toxicol, 11(3).
4. Eman Bedier Abd-Elbaset Ali, Ahmed Mohamed Hesham, (2021), Practical Approach to Improve Biogas Produced from Poultry Manure, International journal of engineering research & technology (IJERT) NREST – 2021 (Volume 09 – Issue 04): 157-160.
5. Ahmed Hesham, Gasser Khairy, Hossam S. Jahin, Yasser Mahmoud Awad, Sabry El-Korashy. (2021, Feb. 26-28), Dates kernels utilization for green adsorbent preparation and rapid characterization technique for produced hydrochar, 1st International Industrial Chemistry Conference - NED University of Engineering & Technology, Karachi, Pakistan.

Biography

Ahmed Mohamed Hesham obtained his M. Sc. in environmental chemistry from Ain Shams University. Plus earned his Ph.D. in inorganic and analytical chemistry from Suez Canal University, Egypt. Ahmed has been involved with studies related to environmental applications using both green and nanotechnology. Ahmed has been serving as a reviewer of reputed Journals.

ahmed_hesham@science.suez.edu.eg

25th International Conference on
ADVANCED NANOSCIENCE AND NANOTECHNOLOGY
May 06-07, 2022 | Webinar

Received date: 06-04-2022 | Accepted date: 08-04-2022 | Published date: 24-05-2022

Synthesis and characterization V2O5/SiO2 nano catalyst

Ali Alnazaa Alhamad, M.N.Alaya
Aleppo University, Syria

Catalysis plays a major role in chemical, physical, and biological sciences. It has become, over the years, one of the most important fields in chemistry, as some 85%-90% of industrial processes include at least one catalytic step and, more recently, in environmental chemistry. The main role of a catalyst is to decrease the activation energy of a chemical reaction and, in a multiproduct reaction, to favor the most important one, i.e. to favor selectivity which is now a major concern to avoid at most the formation of unwanted byproducts, even at the expense of the reaction activity.

Biography

Ali Alnazaa Alhamad is a Ph.D. graduate and lecturer in physical chemistry who specializes in surfaces and catalysis at Aleppo University, Syria. He is from the Faculty of Basic Sciences and holds a master's degree in physical chemistry with a specialization in surfaces and catalysis with an excellent grade. Currently, he is working on research on the topic of Preparation and Characterization of Sulfated Iron Oxide. He is currently working on the preparation and characterization of silica vanadia nano-catalysts using various techniques. His research interest is the sciences of nano-catalysts, their preparation methods, and their uses in various industries.

che.alialnazaa@gmail.com

25th International Conference on
ADVANCED NANOSCIENCE AND NANOTECHNOLOGY
May 06-07, 2022 | Webinar

Received date: 22-03-2022 | Accepted date: 26-03-2022 | Published date: 24-05-2022

Thin-film (FTO/BaTiO3/AgNPs) for enhanced piezo-photocatalytic degradation of methylene blue and ciprofloxacin in wastewater

Daniel Masekela, Nomso H. Mbita and Nonhlangabezo Mabuba
University of Johannesburg, South Africa

Advanced oxidation processes (AOPs) including photocatalysis and piezocatalysis have been extensively used for wastewater treatment. In this study, barium titanate/silver nanoparticles (BaTiO3/AgNPs) was fabricated and supported on Fluorine-doped Tin Oxide (FTO) glass to produce thin-film (FTO/ BaTiO3/AgNPs) for the degradation of organic waste pollutants (Methylene blue and Ciprofloxacin). The prepared piezo-photocatalyst materials were characterized by XRD, SEM, TEM, EDS, UV- DRS, TGA, PL, BET, EIS, and chronoamperometry. The UV-DRS showed surface plasmon resonance (SPR) of Ag nanoparticles on the surface of BaTiO3 at a wavelength of 505 nm. TEM images revealed the average Ag nanoparticles size deposited on the surface of BaTiO3 to be in the range of 10-15 nm. The chronoamperometry showed that the photoreduction of silver nanoparticles (AgNPs) onto BaTiO3 (BTO) resulted in piezo-electrochemical current enhancement from 0.24 mA to 0.38 mA. The composites (FTO/ BaTiO3/AgNPs) achieved a higher degradation of MB and CIP when the photocatalysis and piezocatalysis processes were merged. Under both ultrasonic vibration and UV light exposure, FTO/BTO/AgNPs degraded about 72 % and 98 % of CIP and MB from wastewater, respectively. These piezoelectric thin films were shown to be efficient and reusable even after 3 cycles, suggesting that it is highly stable. Furthermore, the reactive oxygen species (ROS) studies demonstrated that hydroxyl radicals (•OH) were the most effective species during the degradation of MB, with minor superoxide radicals (•O2-) and holes (h+). From this study, we were able to show that these materials can be used as multifunctional materials as they were able to degrade both the dye and pharmaceutical pollutants. Moreover, they were more efficient through the piezo-photocatalytic process.

Recent Publications

1. Masekela D, Yusuf TL, Hintsho-Mbita NC, and Mabuba N (2022) Low Cost, Recyclable and Magnetic Moringa Oleifera Leaves for Chromium(VI) Removal From Water. Front. Water 4:722269.
2. Masekela, Daniel & Hintsho-Mbita, Nomso & Mabuba, N. (2020). Diethylamine functionalised Moringa oleifera leaves for the removal of chromium(VI) and bacteria from wastewater. International Journal of Environmental Analytical Chemistry. 1-21

Biography

Daniel Masekela completed his master's degree in nanoscience (Nanochemistry) at the age of 24 from the University of Johannesburg (RSA), and BSc honors (Chemistry) from the University of Limpopo (RSA). His research focuses on nanomaterials synthesis and fabrication, application of nanomaterials in wastewater and water treatment/purification, medicine, biology, energy, and electro-catalysis. Focusing on nanoscience and nanotechnology, he is aiming to develop new technologies and nanomaterials for water and wastewater treatment, solar energy conversion, transmission, and storage with a high impact on the environment and economy.

masekeladaniel@gmail.com

25th International Conference on
ADVANCED NANOSCIENCE AND NANOTECHNOLOGY
May 06-07, 2022 | Webinar

Received date: 28-04-2022 | Accepted date: 03-05-2022 | Published date: 24-05-2022

Hepatotoxicity by paracetamol and role of curcumin nanoparticles antioxidants as protective agents

Abdelsalam Abuzreda
Benghazi University, Libya

Humans are exposed to nanoparticles (NPs) from ambient air and certain workplaces. The data on the potential health hazards of NPs exposure is limited. From the literature, there is not enough data on cardiotoxicity, neurotoxicity, and lung toxicity induced by the co-exposure to iron oxide nanoparticles (Fe2O3NPs) with silver nanoparticles (AgNPs). Therefore, the present study aimed to investigate the toxic effect of Fe2O3NPs, AgNPs alone or in combination on the brain, heart, and lungs of male rats. Animals were divided into 4 equal groups. Group 1 served as control, group 2 was administered orally with Fe2O3NPs (5 mg/kg BW; >50 nm), group 3 was treated intraperitoneally with AgNPs (50 mg/kg BW; >100 nm) and group 4 was administered with the mixture of Fe2O3NPs plus AgNPs. Animals were treated every day for 79 days. The present results showed that at the molecular level Fe2O3NPs, AgNPs, and their mixture showed marked DNA fragmentation as a hallmark of cell death. At the gene expression level Fe2O3NPs, AgNPs, and their mixture showed significant suppression of the mitochondrial transcription factor A (mtTFA) gene, while showing significant induction of peroxisome proliferator activator receptor gamma-coactivator 1α (PGC-1α) gene. Both genes; mtTFA and PGC-1α are involved in the regulation of mitochondrial biogenesis and function. Fe2O3NPs, AgNPs, and their mixture caused a significant decrease in final body weight, body weight gain, serotonin, dopamine, acetylcholine esterase, paraoxonase 1, antioxidant enzymes (GST, SOD, CAT, and GPX), total antioxidant capacity, and reduced glutathione in brain, heart, lung, and plasma. Whereas, Fe2O3NPs, AgNPs, and their mixture resulted in a significant increase in norepinphrineiron, acetylcholine, creatine kinase, thiobarbituric acid-reactive substances, nitric oxide, tumor suppressor gene p53, tumor necrosis factor-α, interliukin-6, and lipid profiles. Fe2O3NPs, AgNPs, and their mixture showed histology changes alteration in the brain, heart, and lung. In conclusion, the obtained data showed that Fe2O3NPs, and AgNPs alone and in combination induced neurotoxicity, cardiotoxicity, and lung toxicity. The toxic effects of the combination of Fe2O3NPs with AgNPs were more pronounced than each one.

Keywords: Iron oxide nanoparticles; Silver nanoparticles: Male rats; Oxidative stress; Antioxidants; cardiotoxicity, neurotoxicity, and lung toxicity, Cytokines; Mitochondrial transcription factor A peroxisome proliferator activator receptor gamma-coactivator 1α, Biochemical and histology changes.

Recent Publications

1. Mosa IF, Abd HH, Abuzreda A, Yousif AB, Assaf N. (2021) Chitosan and curcumin nanoformulations against potential cardiac risks associated with hydroxyapatite nanoparticles in Wistar male rats. International Journal of Biomaterials. Jul 29;2021
2. Yousif AB, Mosa IF, Abd HH, Abuzreda A, Assaf N,.(2020) Bioevaluation of the role of chitosan and curcumin nanoparticles in ameliorating genotoxicity and inflammatory responses in rats' gastric tissue followed hydroxyapatite nanoparticles' oral uptake. Toxicology Research. Jul;9(4):493-508.
3. Yousef MI, Abuzreda AA, Kamel MA, (2019). Cardiotoxicity and lung toxicity in male rats induced by long-term exposure to iron oxide and silver nanoparticles. Experimental and therapeutic medicine. Dec 1;18(6):4329-39.
4. Yousef MI, Abuzreda AA, Kamel MA (2019). Neurotoxicity and inflammation induced by individual and combined exposure to iron oxide nanoparticles and silver nanoparticles. Journal of Taibah University for Science. Dec 11;13(1):570-8.

Biography

Abdelsalam Abuzreda is a Ph.D. graduate in Nanotoxicity on Molecular and Physiological Characteristics and he is the Assistant Professor and Postdoctoral Research fellow at Benghazi University. Currently, he is a researcher in the Department of Health Safety and Environmental (HSE), Arabian Gulf Oil Company (AGOCO). He has contributed to various conferences and many publications in his research interests such as Material Characterization, Nanoparticle Synthesis, Nanoparticle Preparation, Nanomaterials Synthesis, Nanomaterials, Nanoscience, Nanostructured Materials, Nanobiotechnology, Polymers, and Biomaterials.

Bozrida@yahoo.com