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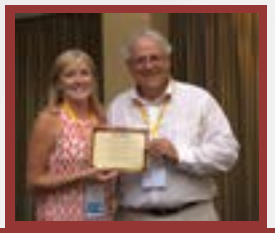


Scientific Tracks & Abstracts

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Removal some endocrine-disrupting compounds by N-doped BiOBr nanoparticle under solar light

Delia Teresa Sponza
Dokuz Eylül University, Turkey

Some endocrine-disrupting compounds like 17β-estradiol, 17α-ethinylestradiol and 4-tert-octylphenol was removed from the surface waters using the N-BiOBr nanocomposite prepared under laboratory conditions. N doping on BiOBr improved the specific surface area and the photocatalytic activity of N-BiOBr. This phenomenon also decreased excessively the acute and chorinic toxicity originating from the 17β-estradiol, 17α-ethinylestradiol and 4-tert-octylphenol. The effects of N percentage removals of the removals of endocrine-disrupting compounds and activity on NBiOBr semiconductor was researched. The effects of N-BiOBr nanocomposite concentrations (0,5, 1, 1,5 and 2 mg/L), the effects of N percentages (2%,4%,6%,10%,15%) the effects of sun ligth power (1, 2, 4, 7 and 9 W/m2) and contacting times (10, 20, 30 and 40 min) on the of mineralization of endocrine-disruptings were studied. The toxicities performed by V. Fischeri and D. magna showed that the toxicities decreased from 98% to 8% at N-BiOBr nanocomposite concentration of 1,5 mg/l,at a N percentage of 10% after a sun ligth power of 4 W/m2 ana afte 30 retention time under sunligth. By doping BiOBr with N an effective photocatalytic removal process was tedected. Under optimized conditions; 17β-estradiol, 17α-ethinylestradiol and 4-tert-octylphenol were photocatalically removed with yield as high as 99%, 98% and 97%,respectively.

Keywords: N-doped BiOBr, Photocatalysis, Endocrine-disrupting compounds, 17β-estradiol, 17α-ethinylestradiol, 4-tert-octylphenol.

Biography

Delia Teresa Sponza is currently working as a professor at Dokuz Eylül University, Department of Environmental Engineering. Scientific study topics are; Environmental engineering microbiology, Environmental engineering ecology, Treatment of fluidized bed and activated sludge systems, Nutrient removal, Activated sludge microbiology, Environmental health, Industrial toxicity and toxicity studies, The effect of heavy metals on microorganisms, Treatment of toxic compounds by anaerobic / aerobic sequential processes, Anaerobic treatment of organic chemicals that cause industrial toxicity and wastewater containing them, Anaerobic treatability of wastewater containing dyes, Treatment of antibiotics with anaerobic and aerobic sequential systems, Anaerobic and aerobic treatment of domestic organic wastes with different industrial treatment sludges, Treatment of polyaromatic compounds with bio-surfactants in anaerobic and aerobic environments, Treatment of petrochemical, Textile and olive processing industry wastewater by sonication, Treatment of olive processing industry wastewater with nanoparticles and the toxicity of nanoparticles. She has many international publications.

Received: May 17, 2022; **Accepted**: May 19, 2022; **Published**: August 01, 2022

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Advanced Nanotechnology
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August 01-02, 2022
WEBINAR

Sabu Thomas, Nano Res Appl(Los Angeles) 2022, Volume 08

Circular economy: New opportunities in sustainable nano materials and polymer bio-nanocomposites

Sabu Thomas
Mahatma Gandhi University, India

Green chemistry started for the search of benign methods for the development of nanoparticles from nature and their use in the field of antibacterial, antioxidant, and antitumor applications. Bio wastes are eco-friendly starting materials to produce typical nanoparticles with well-defined chemical composition, size, and morphology. Cellulose, starch, chitin and chitosan are the most abundant biopolymers around the world. All are under the polysaccharides family in which cellulose is one of the important structural components of the primary cell wall of green plants. Cellulose nanoparticles (fibers, crystals and whiskers) can be extracted from agro waste resources such as jute, coir, bamboo, pineapple leafs, coir etc. Chitin is the second most abundant biopolymer after cellulose, it is a characteristic component of the cell walls of fungi, the exoskeletons of arthropods and nanoparticles of chitin (fibers, whiskers) can be extracted from shrimp and crab shells. Chitosan is the derivative of chitin, prepared by the removal of acetyl group from chitin (Deacetylation). Starch nano particles can be extracted from tapioca and potato wastes. These nanoparticles can be converted into smart and functional biomaterials by functionalization through chemical modifications (esterification, etherification, TEMPO oxidation, carboxylation and hydroxylation etc) due to presence of large amount of hydroxyl group on the surface. The preparation of these nanoparticles includes both series of chemical as well as mechanical treatments; crushing, grinding, alkali, bleaching and acid treatments. Transmission electron microscopy (TEM), scanning electron microscopy (SEM) and atomic force microscopy (AFM) are used to investigate the morphology of nanoscale biopolymers. Fourier transform infra-red spectroscopy (FTIR) and x ray diffraction (XRD) are being used to study the functional group changes, crystallographic texture of nanoscale biopolymers respectively. Since large quantities of bio wastes are produced annually, further utilization of cellulose, starch and chitins as functionalized materials is very much desired. The cellulose, starch and chitin nano particles are currently obtained as aqueous suspensions which are used as reinforcing additives for high performance environment-friendly biodegradable polymer materials. These nanocomposites are being used as biomedical composites for drug/gene delivery, nano scaffolds in tissue engineering and cosmetic orthodontics. The reinforcing effect of these nanoparticles results from the formation of a percolating network based on hydrogen bonding forces. The incorporation of these nano particles in several bio-based polymers have been discussed. The role of nano particle dispersion, distribution, interfacial adhesion and orientation on the properties of the ecofriendly bio Nanocomposites has been carefully evaluated.

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Biography

Sabu Thomas is currently Vice Chancellor of Mahatma Gandhi University, Kottayam, India. Prof. Thomas is a highly committed teacher and a remarkably active researcher well-known nationally and internationally for his outstanding contributions in polymer science and nanotechnology. He has published over 1200 research articles in international refereed journals. And has also edited and written 165 books with an H-index of 122 and total citation of more than 72,000. He has received a large number of international and national awards and recognitions. Under the leadership of Prof. Thomas, Mahatma Gandhi University has been transformed into a top University in the country where excellent outcome-based education is imparted to the students for their holistic development.

Received: May 03, 2022; **Accepted**: May 06, 2022; **Published**: August 01, 2022

35th World congress on Pharmacology
38th International Conference on
Advanced Nanotechnology
12th European Chemistry Congress
August 01-02, 2022
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Preparation of TiO_2/CdS/GO/Pt nanocomposite to produce methane from waste CO_2

Delia Teresa Sponza
Dokuz Eylül University, Turkey

XRD results showed that TiO_2 exhibited crystalline properties ana the peaks at 2θ values of 25.63°, 37.5° and 48.4° can be indexed to the (102), (005) and (200) planes of anatase titania. The XRD emissions from the rutile phase showed that TiO_2 disappear in the TiO_2 /CdS nanocomposite since anatase from is is dominated in TiO_2. Vey low platinum signals was detected from TiO_2 /CdS/Pt since the platinum percentage is low. HR-TEM image of the TiO_2 /CdS nanocomposite exhibited that it was accumulated on a copper grid. SEM images exhibited that Pt nanoparticles are homogeneously dispersed over GO. HAADF images of the TiO_2 /CdS/rGO/Pt nanocomposite exhibited that both Pt and TiO_2/CdS nanoparticles are supported on the surface of GO. The effcts of increasing TiO_2 /CdS/GO/Pt nanocomposite concentration (0,1;0,2;0,5 and 1 mg/l), GO percentages (5%, 10%,15%,20%), sunligth powers(1 W/m2; 3, 5 , 10 and 15 W/m2), sunligth duration (10 min,20,40,50 and 70min) on the methane production from waste CO_2 was investigated. Furthermore, the effects of waste CO_2 concentrations on the methane production was studied. A cost analysis was performed for methane production from CO_2. After 50 min illumination time at a 0,5 mg/l TiO_2 /CdS/GO/Pt nanocomposite dose at a GO percentage of 10%, at a sunligth power of 1 W/ m2 from 10 mg/l CO_2 gas 35 mg/day CH_4 gas was produced.

Keywords: TiO_2/CdS/GO/Pt nanocomposite, Methane, Waste CO_2, Photooxidation.

Biography

Delia Teresa Sponza is currently working as a professor at Dokuz Eylül University, Department of Environmental Engineering. Scientific study topics are; Environmental engineering microbiology, Environmental engineering ecology, Treatment of fluidized bed and activated sludge systems, Nutrient removal, Activated sludge microbiology, Environmental health, Industrial toxicity and toxicity studies, The effect of heavy metals on microorganisms, Treatment of toxic compounds by anaerobic / aerobic sequential processes, Anaerobic treatment of organic chemicals that cause industrial toxicity and wastewater containing them, Anaerobic treatability of wastewater containing dyes, Treatment of antibiotics with anaerobic and aerobic sequential systems, Anaerobic and aerobic treatment of domestic organic wastes with different industrial treatment sludges, Treatment of polyaromatic compounds with bio-surfactants in anaerobic and aerobic environments, Treatment of petrochemical, Textile and olive processing industry wastewater by sonication, Treatment of olive processing industry wastewater with nanoparticles and the toxicity of nanoparticles. She has many international publications.

Received: May 17, 2022; **Accepted**: April 19, 2022; **Published**: August 01, 2022

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Nanocellulose: From fundamentals to advanced materials

R.A. Ilyas
University of Technology Malaysia, Malaysia

Over the past decade, Nanocellulose has been proven to be one of the most prominent green materials of modern times. This renewable nanofiber has been used in wide range of applications from flexible packaging to advanced bio-scaffolds for tissue regeneration. The use of these renewable materials is important in future technologies. Nanocellulose have been the subject of decades of research due to their versatility and particularly their use in actuators, sensors, energy storage, space structure, membrane, packaging, automotive, and biomedical applications. Besides, Nanocellulose have found extensive application in smart hybrid systems, as nanocellulose can both contribute to the optical, thermal and mechanical properties of the system and bear stimuli-responsive surface modifications. In this presentation, we explain the outline of current development in this particular field, including the isolation, characterization, behaviour, and various applications of Nanocellulose reinforced polymer nanocomposites. The recent research on nanocellulose-containing smart hybrid systems will also be covered, with attention given to the fabrication methodologies that have been utilized. Besides that, we hope to impart the audience with some of the excitement that currently surrounds nanocellulose research, which ascends from the renewable source nature of the nanofiber, their fascinating, morphological, mechanical, chemical and physical properties, and the a variety of applications that can be developed from these nanomaterials. Besides that, the unique application of nanocellulose in shape memory polymers and self-healing nanocomposites will be deliberated.

Keywords: Nanocellulose, Nanocomposite.

Biography

R.A. Ilyas is a senior lecturer in School of Chemical and Energy Engineering, Faculty of Engineering, Universiti Teknologi Malaysia, Malaysia. He received his Diploma in Forestry at Universiti Putra Malaysia, Bintulu Campus (UPMKB) and Sarawak, Malaysia from Mei 2009 to April 2012. In 2012, he was awarded the Public Service Department (JPA) scholarship to pursue his Bachelor's Degree (BSc) in Chemical Engineering at University Putra Malaysia (UPM). Upon completing his BSc. programme in 2016, he was again awarded the Graduate Research Fellowship (GRF) by the Universiti Putra Malaysia (UPM) to undertake a PhD degree in the field of Biocomposite Technology & Design at Institute of Tropical Forestry and Forest Products (INTROP) UPM. R.A. Ilyas was the recipient of MVP Doctor of Philosophy Gold Medal Award UPM 2019, for Best PhD Thesis and Top Student Award.

Received: June 14, 2022; **Accepted**: June 17, 2022; **Published**: August 01, 2022