

The Effect Of Zinc Oxide Nano And Microparticles And Zinc

As recognized, adventure as with ease as experience nearly lesson, amusement, as skillfully as promise can be gotten by just checking out a book **The Effect Of Zinc Oxide Nano And Microparticles And Zinc** furthermore it is not directly done, you could receive even more vis--vis this life, not far off from the world.

We offer you this proper as skillfully as simple artifice to get those all. We find the money for The Effect Of Zinc Oxide Nano And Microparticles And Zinc and numerous books collections from fictions to scientific research in any way. in the midst of them is this The Effect Of Zinc Oxide Nano And Microparticles And Zinc that can be your partner.

Sustainable Agriculture Reviews 53 -

Mohammad Faizan 2022-01-28

This book presents recent developments involving the role of nanoparticles on stress tolerance. In particular, nanoparticles have the

potential to provide effective solutions to the multiple agriculture-related problems.

Nanoparticles present enhanced reactivity and thus better effectiveness when compared to their bulkier counterparts due to their higher surface-

to-volume ratio.

Toxicity Assessment of Industrial- and Sunscreen-derived ZnO Nanoparticles - Eleonora Spisni 2016

The aim of the present case study is investigating the toxic effects derived from nanosized zinc oxide nanoparticles toward the marine life. In particular, the present study evaluates for the first time the growth inhibition induced by both industrial-derived and sunscreen self-extracted zinc oxide nanoparticles on the diatom *Thalassiosira pseudonana*. The experiments, performed at the Environmental Engineering Laboratory of the University of Miami, showed that the toxic effects induced by nano-ZnO were influenced by the type of nanoparticle, as well as their concentration in aqueous media and the exposure time. Specifically, smaller, industrial-derived nano-ZnO induced a greater growth inhibition compared to sunscreen-derived ones, especially at lower nanoparticle concentration in the aqueous media. This behavior might indicate that at higher

nanoparticle concentration the toxicity is controlled by nanoparticle aggregation (regardless of nanoparticle size), whereas at lower nanoparticle concentration the toxicity is influenced by the nanoparticle size, as well as nanoparticle type and exposure time. The aim of the present case study is investigating the toxic effects derived from nanosized zinc oxide nanoparticles toward the marine life. In particular, the present study evaluates for the first time the growth inhibition induced by both industrial-derived and sunscreen self-extracted zinc oxide nanoparticles on the diatom *Thalassiosira pseudonana*. The experiments, performed at the Environmental Engineering Laboratory of the University of Miami, showed that the toxic effects induced by nano-ZnO were influenced by the type of nanoparticle, as well as their concentration in aqueous media and the exposure time. Specifically, smaller, industrial-derived nano-ZnO induced a greater growth inhibition compared to sunscreen-derived ones,

especially at lower nanoparticle concentration in the aqueous media. This behavior might indicate that at higher nanoparticle concentration the toxicity is controlled by nanoparticle aggregation (regardless of nanoparticle size), whereas at lower nanoparticle concentration the toxicity is influenced by the nanoparticle size, as well as nanoparticle type and exposure time.

Fate of Coated Zinc Oxide Nanoparticles in Landfill Leachate - Stephanie Carbone Bolyard 2012

Given the increase in nanomaterial (NM) use in consumer products and the large fraction of waste placed in landfills worldwide, the probability of these products reaching municipal solid waste (MSW) landfills at the end of their useful life is high. Since nanotechnology use is still in its early stages, there are currently no regulations pertaining to the disposal of NMs and their fate in MSW landfills is still unknown. Understanding the fate of NMs in MSW landfills is vital to ensure the proper handling of these novel

materials from cradle to grave; such research will provide information on how these NMs can be safely introduced into the environment. This research seeks to understand the fate of NMs within waste environments by examining the interactions between NMs and landfill leachate components. The primary focus of this thesis is the effect of Zinc Oxide (ZnO) on biological landfill processes, solids aggregation, and chemical speciation of Zn in landfill leachate following the addition of crystalline, nano-sized ZnO coated with triethoxycaprylylsilane. This research (1) observed the effects of coated ZnO on five-day biochemical oxygen demand (BOD5) and biochemical methane potential (BMP), (2) examined effects of solids aggregation on the fate of ZnO, (3) quantified the concentration of Zinc (Zn) by size fractions, and (4) modeled the chemical speciation of Zn in landfill leachate using Visual MINTEQ. No change in dissolved Zn was observed after coated ZnO was exposed to "middle-aged" leachate. Upon exposure to

"mature" leachate there was an increase in dissolved Zn assumed to be a result of the dissociation of ZnO. Solids data supported the aggregation of particles in both middle aged and mature leachate. There was an increase in the Zn concentration in leachate fractions greater than 1500 nm presumably due to the dispersion of normally insoluble ZnO nanoparticles (NPs) following the interaction with humic acids (HA). ZnO did not inhibit anaerobic or aerobic processes in either middle aged or mature leachate, presumably due to the relatively low concentration of dissolved ionic Zn. Despite the observation of increased dissociation upon exposure to mature leachate, the presence of dissolved organic matter (DOM) may have hindered the ability for dissolved ionic Zn to become bioavailable. Fractionation, BOD5 and BMP tests, and chemical speciation modeling provided insight on the mobility of ZnO in landfills and the absence of inhibitory effects on landfill processes. Aggregation of ZnO NPs may

prevent movement through traditional containment systems (i.e. geomembrane liners) due to the increased particle size. However, the increased dispersion suggests that ZnO NPs will be transported out of the landfill in the leachate, however biological treatment of leachate should be unaffected by the presence of ZnO. The bioavailability of Zn was not substantially affected by the presence of ZnO due to affinity of dissolved Zn for DOM. However, due to the heterogeneity of landfill leachate and the utilization of different NM coatings, it is challenging to predict the overall mobility of other NMs in a landfill.

Nanotechnology in Plant Growth Promotion and Protection - Avinash P. Ingle 2021-09-06
Discover the role of nanotechnology in promoting plant growth and protection through the management of microbial pathogens In Nanotechnology in Plant Growth Promotion and Protection, distinguished researcher and author Dr. Avinash P. Ingle delivers a rigorous and

insightful collection of some of the latest developments in nanotechnology particularly related to plant growth promotion and protection. The book focuses broadly on the role played by nanotechnology in growth promotion of plants and their protection through the management of different microbial pathogens. You'll learn about a wide variety of topics, including the role of nanomaterials in sustainable agriculture, how nano-fertilizers behave as soil feed, and the dual role of nanoparticles in plant growth promotion and phytopathogen management. You'll also discover why nanotechnology has the potential to revolutionize the current agricultural landscape through the development of nano-based products, like plant growth promoters, nano-fertilizers, nano-pesticides, and nano-insecticides. Find out why nano-based products promise to be a cost-effective, economically viable, and eco-friendly approach to tackling some of the most intractable problems in agriculture today. You'll also benefit from the

inclusion of: A thorough introduction to the prospects and impacts of using nanotechnology to promote the growth of plants and control plant diseases An exploration of the effects of titanium dioxide nanomaterials on plant growth and the emerging applications of zinc-based nanoparticles in plant growth promotion Practical discussions of nano-fertilizer in enhancing the production potentials of crops and the potential applications of nanotechnology in plant nutrition and protection for sustainable agriculture A concise treatment of nanotechnology in seed science and soil feed Toxicological concerns of nanomaterials used in agriculture Perfect for undergraduate, graduate, and research students of nanotechnology, agriculture, plant science, plant physiology, and crops, Nanotechnology in Plant Growth Promotion and Protection will also earn a place in the libraries of professors and researchers in these areas, as well as regulators and policymakers.

ZnO and TiO₂ Based Nanostructures -

Andrea Lamberti 2018-10-15

This book is a printed edition of the Special Issue "ZnO and TiO₂ Based Nanostructures" that was published in Nanomaterials

Biochemical Toxicology - Muharrem Ince

2020-07-29

Biochemical Toxicology - Heavy Metals and Nanomaterials provides an overview of biochemical contamination, nanomaterials and toxic metals, and measurement techniques. It explains and clarifies important studies and compares and develops new and groundbreaking measurement techniques in the fields of organic and inorganic pollution and nanoscience. It is highly recommended for professionals and readers interested in the environment and human health.

Zinc Oxide Nanostructures: Synthesis and Characterization - Sotirios Baskoutas 2018-12-04

This book is a printed edition of the Special Issue "Zinc Oxide Nanostructures: Synthesis and Characterization" that was published in Materials

Nanobiotechnology Applications in Plant Protection - Kamel A. Abd-Elsalam 2019-10-04

Nanobiotechnology Applications in Plant Protection: Volume 2 continues the important and timely discussion of nanotechnology applications in plant protection and pathology, filling a gap in the literature for nano applications in crop protection. Nanobiopesticides and nanobioformulations are examined in detail and presented as powerful alternatives for eco-friendly management of plant pathogens and nematodes. Leading scholars discuss the applications of nanobiomaterials as antimicrobials, plant growth enhancers and plant nutrition management, as well as nanodiagnostic tools in phytopathology and magnetic and supramagnetic nanostructure applications for plant protection. This second volume includes exciting new content on the roles of biologically synthesized nanoparticles in seed germination and zinc-based nanostructures in protecting against toxigenic fungi. Also included is new

research in phytotoxicity, nano-scale fertilizers and nanomaterial applications in nematology and discussions on Botrytis grey mold and nanobiocontrol. This book also explores the potential effects on the environment, ecosystems and consumers and addresses the implications of intellectual property for nanobiopesticides. Further discussed are nanotoxicity effects on the plant ecosystem and nano-applications for the detection, degradation and removal of pesticides. Effect of Nano Copper Oxide and Nano Zinc Oxide on Mineral Bioavailability, Performance, and Health of Ruminants - Annie Williams 2021

Characterization of Pharmaceutical Nano- and Microsystems - Leena Peltonen 2020-10-27

Learn about the analytical tools used to characterize particulate drug delivery systems with this comprehensive overview Edited by a leading expert in the field, Characterization of Pharmaceutical Nano- and Microsystems provides a complete description of the analytical

techniques used to characterize particulate drug systems on the micro- and nanoscale. The book offers readers a full understanding of the basic physicochemical characteristics, material properties and differences between micro- and nanosystems. It explains how and why greater experience and more reliable measurement techniques are required as particle size shrinks, and the measured phenomena grow weaker. Characterization of Pharmaceutical Nano- and Microsystems deals with a wide variety of topics relevant to chemical and solid-state analysis of drug delivery systems, including drug release, permeation, cell interaction, and safety. It is a complete resource for those interested in the development and manufacture of new medicines, the drug development process, and the translation of those drugs into life-enriching and lifesaving medicines. Characterization of Pharmaceutical Nano- and Microsystems covers all of the following topics: An introduction to the analytical tools applied to determine particle size,

morphology, and shape Common chemical approaches to drug system characterization A description of solid-state characterization of drug systems Drug release and permeation studies Toxicity and safety issues The interaction of drug particles with cells Perfect for pharmaceutical chemists and engineers, as well as all other industry professionals and researchers who deal with drug delivery systems on a regular basis, Characterization of Pharmaceutical Nano- and Microsystems also belongs on bookshelves of interested students and faculty who interact with this topic.

Zinc-Based Nanostructures for Environmental and Agricultural Applications - Kamel A. Abd-Elsalam 2021-05-22

Zinc-Based Nanostructures for Environmental and Agricultural Applications shows how zinc nanostructures are being used in agriculture, food and the environment. The book has been divided into two parts: Part I deals with the synthesis and characterization of zinc-based

nanostructures such as biogenic, plant, microbial, and actinobacteria mediated synthesis of zinc nanoparticles, Part II is focused on agri-food applications such as antibacterial, antifungal, antimicrobial, plant disease management, controlling post-harvest diseases, pesticide sensing and degradations, plant promotions, ZnO nanostructure for food packaging application, safe animal food and feed supplement, elimination of mycotoxins, and veterinary applications. Part III reviews technological developments in environmental applications such as risks and benefits for aquatic organisms and the marine environment, antiseptic activity and toxicity mechanisms, wastewater treatment, and zinc oxide-based nanomaterials for photocatalytic degradation of environmental and agricultural pollutants. The book discusses various aspects, including the application of zinc-based nanostructures to enhance plant health and growth, the effect on soil microbial activity, antimicrobial mechanism, phytotoxicity and

accumulation in plants, the possible impact of zinc-based nanostructures in the agricultural sector as nanofertilizer, enhancing crop productivity, and other possible antimicrobial mechanisms of ZnO nanomaterials. Explores the impact of a large variety of zinc-based nanostructures on agri-food and environment sectors Outlines how the properties of zinc-based nanostructures mean they are particularly efficient in environmental and agricultural application areas Assesses the major challenges of synthesizing and processing zinc-based nanostructured materials

Nanoparticles in Analytical and Medical Devices - Fang Gang 2020-09-01

Nanoparticles in Analytical and Medical Devices presents the latest information on the use of nanoparticles for a diverse range of analytical and medical applications. Covers basic principles, proper use of nanoparticles in analytical and medical applications, and recent progress in the field. This comprehensive reference helps

readers grasp the full potential of nanoparticles in their analytical research or medical practice. Chapters on cutting-edge topics bring readers up to date on the latest research and usage of nanoparticles, and a chapter on commercially available devices that utilize nanoparticles guides readers in overcoming issues with marketing biodevices. Synthesizes nanoparticle conjugation and other critical methods Covers nanoparticles in analytical methods and real analytical devices currently used in the medical field Provides useful new information not covered in the current literature in chapters on surface chemical functionalization for bio-immobilization and nanoparticle production from natural sources Investigation of the Effects of Zinc Oxide Nanoparticles and Synthesized Cellulose Nano Crystals (CNCs) on Emulsion-based Drilling Fluids - Tiemele Wilfried Anderson Aka 2019

Nanotechnology for Agriculture - Deepak G Panpatte 2019-11-16

The emergence of nanotechnology and the development of new nano-devices and nanomaterials open up opportunities for novel applications in agriculture and biotechnology. Nanotechnology has the potential to modernize the agricultural research and practice. Nanotechnology has gained momentum in agriculture sector during last decade, but still there are knowledge gap between scientific communities. This book comprise of holistic coverage about current developments in nanotechnology based sustainable agriculture. It contains sections focusing on each aspect of the implications of nanotechnology in different sectors of agriculture from crop production, soil fertility management, crop improvement etc. It also provides insight into the current trends and future prospects of nanotechnology along with the benefits and risks and their impact on agricultural ecosystems. This book emphasize on use of nanotechnology to reduce agrochemical usage via smart delivery system, increase

nutrient use efficiency, improved water and nutrient management, nano-biosensors for management of plant diseases etc. The book provides thorough knowledge for dealing with current challenges of agricultural sector using nanotechnology based agricultural interventions. It will serve as reference literature for scientists, policymakers, students and researchers who are engaged in development of strategies to cope up with challenges of current agricultural systems and society.

In Vitro Toxicity Assessment of Silver and Zinc Oxide Nanoparticles - Clint Edwin Johnson
2009

Nanotoxicology is a nascent field of study concerned with the potential for nanotechnology to adversely impact human health or result in ecological damage. Nanomaterials can display unique physicochemical properties not present in the parent bulk material and it is these properties that may be a potential source of toxicity. There are a growing number of examples of

nanomaterials functioning differently in biosystems compared to the parent bulk material. With the rapid growth of nanotechnology and increasing exposure of people to novel nanomaterials there is an urgent need to evaluate the toxicity of nanomaterials. In this study the toxicities of silver and zinc oxide nanoparticles were assessed. The effects of size and surface coating on the cytotoxicity and immunogenicity of silver nanoparticles were investigated, with cytotoxicity found to be inversely proportional to nanoparticle size. The subcutaneous penetration of zinc oxide nanoparticles was assessed to determine whether this material can be safely used as a UV filter in sunscreens and cosmetics. No dermal penetration was detected using a porcine in vitro model. Zinc oxide nanoparticles were also used as a model material to investigate nano-specific toxicity by comparing cytotoxicity and changes to gene expression with bulk scale zinc oxide. In both cases cytotoxicity and changes to gene

expression were greater for zinc oxide nanoparticles. Methods and techniques to test the toxicity of nanomaterials in vitro and the implication for in vivo toxicity are only beginning to be elucidated. The methods and techniques used in this study, particularly nanomaterial stabilization in biofluids and toxicity testing using blood cell cultures, may assist the establishment of standard in vitro testing protocols for nanomaterials.

Nanotoxicology and Nanosafety 2.0 - Ying-Jan Wang 2020-12-29

With the rapid development of nanotechnology, nanomaterials have been widely applied in many industrial sectors, including medicine, consumer products, and electronics. While such technology has brought benefits and convenience to our daily lives, it may also potentially threaten human health. In some cases, nanomaterials present unexpected risks to both humans and the environment. Assessments of the potential hazards associated with nanotechnology have

been emerging, but substantial challenges remain, because the large number of different nanomaterials cannot be effectively evaluated in a timely manner. The development of a good strategy for a nanomaterials hazard assessment not only promotes the more widespread adoption of non-rodent or 3Rs principles, but also makes nanotoxicology testing more ethical, relevant, and cost- and time-efficient. A thorough understanding of the mechanisms by which nanomaterials perturb biological systems is critical for a more comprehensive elucidation of their nanotoxicity, and this will also facilitate the development of prevention and intervention policies against adverse outcomes induced by them. We hope that the articles included in this eBook can provide updated knowledge on nanotoxicology and nanosafety, from the point of view of both toxicology and ecotoxicology.

Plant Responses to Nanomaterials - Vijay Pratap Singh 2021-04-01

The population of the world continues to increase

at an alarming rate. The trouble linked with overpopulation ranges from food and water scarcity to inadequacy of space for organisms. Overpopulation is also linked with several other demographic hazards, for instance, population blooming will not only result in exhaustion of natural repositories, but it will also induce intense pressure on the world economy. Today nanotechnology is often discussed as a key discipline of research but it has positive and negative aspects. Also, due to industrialization and ever-increasing population, nano-pollution has been an emerging topic among scientists for investigation and debate. Nanotechnology measures any substance on a macromolecular scale, molecular scale, and even atomic scale. More importantly, nanotechnology deals with the manipulation and control of any matter at the dimension of a single nanometer.

Nanotechnology and nanoparticles (NPs) play important roles in sustainable development and environmental challenges as well. NPs possess

both harmful and beneficial effects on the environment and its harboring components, such as microbes, plants, and humans. There are many beneficial impacts exerted by nanoparticles, however, including their role in the management of waste water and soil treatment, cosmetics, food packaging, agriculture, biomedicines, pharmaceuticals, renewable energies, and environmental remedies. Conversely, NPs also show some toxic effects on microbes, plants, as well as human beings. It has been reported that use of nanotechnological products leads to the more accumulation of NPs in soil and aquatic ecosystems, which may be detrimental for living organisms. Further, toxic effects of NPs on microbes, invertebrates, and aquatic organisms including algae, has been measured. Scientists have also reported on the negative impact of NPs on plants by discussing the delivery of NPs in plants. Additionally, scientists have also showed that NPs interact with plant cells, which results in alterations in

growth, biological function, gene expression, and development. Thus, there has been much investigated and reported on NPs and plant interactions in the last decade. This book discusses the most recent work on NPs and plant interaction, which should be useful for scientists working in nanotechnology across a wide variety of disciplines.

Cellular and Molecular Toxicology of Nanoparticles - Quaiser Saquib 2018-02-16

This edited book is a compilation of findings on the molecular and cellular toxicity of nanoparticles (NPs) in animal cell, human cells, invertebrates. The varied selection of test models will provide better understanding about the horizon of NPs toxicity. Interaction of NPs with cells and its organelles can induce toxicological consequences, including transcriptional and translational alterations, DNA damage, cytotoxicity, oxidative stress, mitochondrial dysfunction and cell death. NPs can get internalized in cells through phagocytosis,

macropinocytosis, receptor-mediated endocytosis and passive penetration, which can affect varied cell types. Readers will be benefited with the compilations on basic and molecular facet of NPs toxicity. The chapters will provide a comprehensive information on the state-of-the-art methodologies. The application of toxicogenomic approaches, which is already established in nanotoxicology, has been given special consideration to unravel the toxicodynamics of nanomaterials. Among these approaches, the high-throughput RNA sequencing (RNA-Seq), which is able to build a complete map of transcriptome across different cell types and perturbations upon NPs exposure has been included. The readers are also introduced to the less studied topic on the adsorption of biomolecules (mainly proteins) on the NPs surface, constituting the so-called “biomolecular corona”. The book has been designed for scientists engaged in NPs toxicity research. Nonetheless, it should be of interest to

a variety of scientific disciplines including marine biology, environmental pollution, genetics, pharmacology, medicine, drug and food material sciences, consumer products. Also, the compilations will be of interest to the environmental watchdogs, federal regulators, risk assessors and the policy makers.

Nanostructured Zinc Oxide - Kamlendra Awasthi 2021-08-10

Nanostructured Zinc Oxide covers the various routes for the synthesis of different types of nanostructured zinc oxide including; 1D (nanorods, nanowires etc.), 2D and 3D (nanosheets, nanoparticles, nanospheres etc.). This comprehensive overview provides readers with a clear understanding of the various parameters controlling morphologies. The book also reviews key properties of ZnO including optical, electronic, thermal, piezoelectric and surface properties and techniques in order to tailor key properties. There is a large emphasis in the book on ZnO nanostructures and their role in

optoelectronics. ZnO is very interesting and widely investigated material for a number of applications. This book presents up-to-date information about the ZnO nanostructures-based applications such as gas sensing, pH sensing, photocatalysis, antibacterial activity, drug delivery, and electrodes for optoelectronics. Reviews methods to synthesize, tailor, and characterize 1D, 2D, and 3D zinc oxide nanostructured materials Discusses key properties of zinc oxide nanostructured materials including optical, electronic, thermal, piezoelectric, and surface properties Addresses most relevant zinc oxide applications in optoelectronics such as light-emitting diodes, solar cells, and sensors

Nanotechnology and Plant Sciences - Manzer H. Siddiqui 2015-01-27

This book presents a holistic view of the complex and dynamic responses of plants to nanoparticles, the signal transduction mechanisms involved, and the regulation of gene

expression. Further, it addresses the photosynthesis of nanoparticles, the role of nanoparticles in the antioxidant systems of plants and agriculture, the beneficial and harmful effects of nanoparticles on plants, and the application of nanoparticles and nanotubes to mass spectrometry, aiming ultimately at an analysis of the metabolomics of plants. The growing numbers of inventions in the field of nanotechnology are producing novel applications in the fields of biotechnology and agriculture. Nanoparticles have received much attention because of the unique physico-chemical properties of these compounds. In the life sciences, nanoparticles are used as “smart” delivery systems, prompting the Nobel Prize winner P. Ehrlich to refer to these compounds as “magic bullets.” Nanoparticles also play an important role in agriculture as compound fertilizers and nano-pesticides, acting as chemical delivery agents that target molecules to specific cellular organelles in plants. The

influence of nanoparticles on plant growth and development, however, remains to be investigated. Lastly, this book reveals the research gaps that must be bridged in the years to come in order to achieve larger goals concerning the applications of nanotechnology in the plants sciences. In the 21st century, nanotechnology has become a rapidly emerging branch of science. In the world of physical sciences, nanotechnological tools have been exploited for a broad range of applications. In recent years, nanoparticles have also proven useful in several branches of the life sciences. In particular, nanotechnology has been employed in drug delivery and related applications in medicine.

Inorganic Nanosystems - Md Saquib Hasnain
2023-03-23

Inorganic Nanosystems: Theranostic Nanosystems, Volume Two examines the applications of nanotherapeutic systems and nanodiagnostics in relation to polymeric

nanosystems. In the last decade, numerous biopolymers have been utilized to prepare polymeric nanosystems for therapeutic applications. These biopolymers include polylactic acid, polylactide-co-glycolide, polycaprolactone, acrylic polymers, cellulose and cellulose derivatives, alginates, chitosan, gellan gum, gelatin, albumin, chondroitin sulfate, hyaluronic acid, guar gum, gum Arabic, gum tragacanth, xanthan gum, and starches. Besides these biopolymers, grafted polymers are also being used as advanced polymeric materials to prepare many theranostic nanocarriers and nanoformulations. This book explores the array of polymeric nanosystems to understand therapeutic potentials. It will be useful to pharmaceutical scientists, including industrial pharmacists and analytical scientists, health care professionals, and regulatory scientists actively involved in the pharmaceutical product and process development of tailor-made polysaccharides in drug delivery applications.

Contains in-depth discussions of the inorganic nanosystems including high-quality graphics, flowcharts, and graphs for enhanced understanding Reviews the literature on inorganic nanosystems while also suggesting new avenues Includes contributions in all areas of inorganic nanosystems, providing a thorough and interdisciplinary work

Studies on Effect of Nano Zinc Oxide and Nano Ferric Oxide on Growth and Yield of Rice Under Aerobic Condition (oryza Sativa L.) - C. Naveen Kumar 2022

Plant Nanotechnology - Chittaranjan Kole
2016-10-13

This book highlights the implications of nanotechnology in plant sciences, particularly its potential to improve food and agricultural systems, through innovative, eco-friendly approaches, and as a result to increase plant productivity. Topics include various aspects of nanomaterials: biophysical and biochemical

properties; methods of treatment, detection and quantification; methods of quantifying the uptake of nanomaterials and their translocation and accumulation in plants. In addition, the effects on plant growth and development, the role of nanoparticles in changes in gene and protein expression, and delivery of genetic materials for genetic improvement are discussed. It also explores how nanotechnology can improve plant protection and plant nutrition, and addresses concerns about using nanoparticles and their compliances. This book provides a comprehensive overview of the application potential of nanoparticles in plant science and serves as a valuable resource for students, teachers, researchers and professionals working on nanotechnology.

Toxicology of Nanoparticles and Nanomaterials in Human, Terrestrial and Aquatic Systems - Marc A. Williams 2022-06-27
Toxicology of Nanoparticles and Nanomaterials in Human, Terrestrial and Aquatic Systems An

indispensable compendium detailing the toxicology of nanoparticles with a focus on mechanisms, emerging issues, and new approaches Toxicology of Nanoparticles and Nanomaterials in Human, Terrestrial and Aquatic Systems provides authoritative information on the toxicology of ultrafine and nanoparticulate matter that contaminate terrestrial or aquatic environments and present unique challenges in applied public health and toxicological research. Detailed chapters by a panel of world-renowned experts examine the complementary and dynamic interdependence of aquatic, terrestrial, and human systems and the toxicological impacts on exposure to engineered and manufactured nanoparticles and nanomaterials. Organized into four sections, the book opens with a thorough overview of the field, including known challenges and the necessity for current research activity. The second section describes terrestrial and aquatic systems and the ecotoxicological impact of nanomaterials, followed by critical

analysis of the many human health effects of nanomaterials. The book concludes with an in-depth discussion of current gaps in knowledge, future directions, new approach methodologies, alternatives to animal models, and the emerging environmental threat from nanoplastics. Presenting case exemplars of the ecotoxicological impact of nanoparticles in aquatic and terrestrial systems, this important resource: Presents in-depth coverage of ecosafety, environmental behavior, fate and transport, interactive effects with other contaminants, and current challenges in soil nano-ecotoxicology Addresses rising concerns regarding air pollution and neurological disorders, and the roles played by the gastrointestinal system, the mucosal microbiome, and the immunotoxicology and vasculotoxicity of metal-based nanoparticles Provides detailed coverage of nanomaterial health effects from both animal and in vitro models, including the gut microbiome, innate

immunity, neurological and cardiovascular impacts, mechanisms of action, and hazard characterization Analyzes key topics in ecological nanotoxicology such as environmental micro- and nano-plastic pollution and applied risk assessment Toxicology of Nanoparticles and Nanomaterials in Human, Terrestrial and Aquatic Systems is essential reading for toxicologists, applied biologists, ecotoxicologists, research scientists, medical professionals, regulators, and advanced students in fields such as public health, environmental ecotoxicology and medicine, immunotoxicology, neurotoxicology, cardiovascular and systems biology, hazard identification, and risk assessment.

Nanomaterials for Agriculture and Forestry

Applications - Azamal Husen 2020-03-10
Nanomaterials for Agriculture and Forestry Applications explores how major nanomaterials are being specially used in the agriculture, forestry, and other associated sectors. Plants and their products are used for synthesis of

nanoparticles as they contain primary and secondary metabolites, which reduce the metal salts and metal oxides into their nanoparticles. Exposure of these particles has been examined for their sustainable role and/or interaction with agricultural crops in terms of growth and yields. Nanomaterials accumulation and translocation have shown interaction with cellular organelles, DNA, RNA, proteins, or other biomolecules; and affect various functions of cell organelles. Application of nanosensors holds a significant promise in monitoring signaling pathways, metabolism, detection of crop/soil diseases, and specific pollutants or pesticides. Nanomaterials have also been used in soil and water quality management. In forestry sector, the nanotechnology is considered as the potential platform, which can transform the forest materials into value-added products, such as smart paper, nano-packaging, coating material, building construction, and biomedical and other sectors. This book is an important resource,

showing how nanotechnology is being used to enhance large-scale agricultural and/or industrial application and production.

Nanomaterials: Ecotoxicity, Safety, and

Public Perception - Mahendra Rai 2019-01-04

The environment is prone to suffer pollution and toxic insult from generations of nanomaterials as well from accidental releases during production, transportation, and disposal operations. The NMs could interact with and cause adverse biological effects at cellular, subcellular, and molecular levels. Assessing potential environmental/ecological risks requires quality information on transport and fate of nanoparticles in the environment, exposures and vulnerabilities of organisms to the nanomaterials and standard methods for assessing toxicity for aquatic or terrestrial organisms and human health. The systematic risk characterization and evaluation of the safety of nanomaterials require a multidisciplinary approach and convergence of knowledge and efforts from researchers and

experts from toxicology, biotechnology, materials science, chemistry, physics, engineering, and other branches of life sciences. Although studies are beginning to appear in the literature addressing the toxicity of various nanomaterials and their potential for exposure, at this stage definitive statements regarding the impacts of nanomaterials on human health and the environment remain sketchy requiring an increased level of precautions with regard to nanomaterials, as has happened with other emerging contaminants and technologies (e.g., biotechnology). The need for an increased level of understanding the perception of risk and of benefits will vary and is likely to influence public, regulatory, and non-governmental activities regarding risk and benefit evaluations. Systematic identification and assessment of the risks posed by any new technology are essential. A prudent, integrated, and holistic approach is required to develop best practices based on the scientific understanding about what we know and

what we don't know but need to know. *Nanomaterials* addresses key issues of ecotoxicological actions and effects of nanomaterials on life and environment, their threats, vulnerability, risks, and public perception. The readers learn to read bad news objectively and think about and search for ecological 'green' solutions to current environmental and ecological problems with blue, grey, brown, and red shades for building a sustainable ecosystem. It shows how this molecular terrain is a common ground for interdisciplinary research and education that will be an essential component of science, engineering and technology in the future. The book is divided into three sections. Section 1 includes general topics related to ecotoxicity of nanomaterials to microbes, plants, human and environment. Section 2 incorporates risks generated by the use of nanomaterials. Section 3 discusses safety issues and the public. *Nanomaterials to Enhance Food Quality, Safety,*

and Health Impact - Jose María Lagaron
2020-06-23

Food quality, safety, and fortification are key aspects to guarantee that foods reach consumers in optimal conditions from the point of view of freshness, microbiology, and health promotion. This book overviews the most recent fundamental and oriented efforts by multidisciplinary researchers and technologists on the application of nanoscience and nanotechnology to generate new added value solutions for the food industry. *Nanomaterials to Enhance Food Quality, Safety, and Health Impact* provides a valuable guide for both industry and academic researchers interested in the production of healthier, safer, and sustainable food products.

Advances in Phytonanotechnology - Mansour Ghorbanpour 2019-05-21

Advances in Phytonanotechnology: From Synthesis to Application guides readers through various applications of nanomaterials on plants

by presenting the latest research related to nanotechnology and nanomaterials on plant systems. The book focuses on the effects of these applications on plant morphology, physiology, biochemistry, ecology and genetics. Sections cover the impact on plant yield, techniques, a review of positive and negative impacts, and an overview of current policies regarding the use of nanotechnology on plants. Additionally, the book offers insights into the appropriate application of nanoscience to plants and crops for improved outcome and an exploration of their bioavailability and toxicity in the environment. Discusses the morphological, physiological and biochemical responses of plants to nanomaterials and the ability of the nanomaterials in modifying the genetic constitution of plants Emphasizes new applications of nanomaterials, including nanosensors technology and nanomaterials as nanocarriers based antimicrobial phytochemicals Presents the role of nanotechnology as a novel

technique for the remediation of heavy metals by plants

Zinc Compounds—Advances in Research and Application: 2012 Edition - 2012-12-26

Zinc Compounds—Advances in Research and Application: 2012 Edition is a ScholarlyBrief™ that delivers timely, authoritative, comprehensive, and specialized information about Zinc Compounds in a concise format. The editors have built Zinc Compounds—Advances in Research and Application: 2012 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Zinc Compounds in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Zinc Compounds—Advances in Research and Application: 2012 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources,

and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

Zinc Oxide Based Nano Materials and Devices - , Prof. Dr. Ahmed Nahhas 2019-10-09

This book presents a review of recent advances in ZnO-based nanomaterials and devices. ZnO as a nanomaterial has gained substantial interest in the research area of wide bandgap semiconductors and is considered to be one of the major candidates for electronic and photonic applications. ZnO has distinguished and interesting electrical and optical properties and is considered to be a potential material in optoelectronic applications such as solar cells, surface acoustic wave devices, and UV emitters. ZnO's unique properties have attracted several researchers to study its electrical and optical properties. As a nanostructured material, ZnO

exhibits many advantages for nanodevices. Moreover, it has the ability to absorb the UV radiation.

Toxicology - Marcelo Larramendy 2016-10-26

This edited book, *Toxicology - New Aspects to This Scientific Conundrum*, is intended to provide an overview on the different xenobiotics employed every day in our anthropogenic activities. We hope that this book will continue to meet the expectations and needs of all interested in the implications for the living species of known and new toxicants and to guide them in the future investigations.

Nanoscience for Sustainable Agriculture -

Ramesh Namdeo Pudake 2019-09-23

This book discusses the ability of nanomaterials to protect crop-plant and animal health, increase production, and enhance the quality of food and other agricultural products. It explores the use of targeted delivery and slow- release agrochemicals to reduce the damage to non-target organisms and the quantity released into

the soil and water, as well as nanotechnology-derived tools in the field of plant and animal genetic improvement. It also addresses future applications of nanotechnology in sustainable agriculture and the legislative regulation and safety evaluation of nanomaterials. The book highlights the recent advances made in nanotechnology and its contribution towards an eco-friendly approach in agriculture.

Nanomaterials and Plant Potential - Azamal Husen 2019-03-01

This book discusses the latest developments in plant-mediated fabrication of metal and metal-oxide nanoparticles, and their characterization by using a variety of modern techniques. It explores in detail the application of nanoparticles in drug delivery, cancer treatment, catalysis, and as antimicrobial agent, antioxidant and the promoter of plant production and protection. Application of these nanoparticles in plant systems has started only recently and information is still scanty about their possible

effects on plant growth and development. Accumulation and translocation of nanoparticles in plants, and the consequent growth response and stress modulation are not well understood. Plants exposed to these particles exhibit both positive and negative effects, depending on the concentration, size, and shape of the nanoparticles. The impact on plant growth and yield is often positive at lower concentrations and negative at higher ones. Exposure to some nanoparticles may improve the free-radical scavenging potential and antioxidant enzymatic activities in plants and alter the micro-RNAs expression that regulate the different morphological, physiological and metabolic processes in plant system, leading to improved plant growth and yields. The nanoparticles also carry out genetic reforms by efficient transfer of DNA or complete plastid genome into the respective plant genome due to their miniscule size and improved site-specific penetration. Moreover, controlled application of nanomaterials

in the form of nanofertilizer offers a more synchronized nutrient fluidity with the uptake by the plant exposed, ensuring an increased nutrient availability. This book addresses these issues and many more. It covers fabrication of different/specific nanomaterials and their wide-range application in agriculture sector, encompassing the controlled release of nutrients, nutrient-use efficiency, genetic exchange, production of secondary metabolites, defense mechanisms, and the growth and productivity of plants exposed to different manufactured nanomaterials. The role of nanofertilizers and nano-biosensors for improving plant production and protection and the possible toxicities caused by certain nanomaterials, the aspects that are little explored by now, have also been generously elucidated.

Agricultural and Environmental Nanotechnology - Fabian Fernandez-Luqueno
2023-01-05

This book highlights the best practices regarding

nanoscience and nanotechnology for agriculture and environmental sectors to shape sustainable development thought to improve the quality and quantity of the agriculture products and to decrease the collateral effect of nanotechnology in the ecosystems. Besides, leading nanotechnologies are showed and discussed to guarantee their proper management in lands and ecosystems. Therefore, nanotechnologies such as agronanobiotechnology, nanofertilization, pest control, magnetofection for plant breeding, plant molecular farming, OMICs technologies, phytonanotechnology, nanoremediation, etc. are described in five sections and 21 chapters. Undoubtedly it is an ideal and updated book for undergraduate or postgraduate students, and scientists or researchers involved in nanoscience, nanotechnology, crop production, and remediation technologies as well as for those researchers that solving technical problems regarding the crop management and the human and environmental health without hampering the

pursuit of sustainable development goals.

Nanomaterials in the Wet Processing of Textiles -
Shahid Ul-Islam 2018-02-26

Nanotechnology has attracted attention of textile and polymer scientists and has been playing extraordinary role over the past few decades in the functional finishing of different textile materials. Nanoparticles due to their diverse functions have not only imparted flame retardant, UV-blocking, water repellent, self-cleaning, and antimicrobial properties to the textiles, but also have greater affinity for fabrics leading to an increase in durability of the functions. This book emphasizes recent approaches and strategies that are currently at operation to functionalize both natural and synthetic textile materials using diverse nanoparticles and their composites with polymers. The book concludes by paying attention towards removal of toxic chemicals using state-of-the-art nano-adsorbents. Main Topics 1. Textile dyeing using metallic

nanoparticles 2. Metal oxide nanoparticles for multifunctional finishing 3. New approaches to produce UV protective textiles 4. Polymeric nanocomposites for antimicrobial finishing 5. Self-cleaning of textiles using advanced nanoparticles 6. Silver nanoparticles in dyeing and finishing applications 7. Zinc Oxide – prospects in textile industry 8. Titanium dioxide: Next generation photo-catalysts 9. Textile effluent using chitosan nanocomposites 10. Recent advances in remediation of textile effluents using nano-catalysts

Nanomaterials in Plants, Algae and Microorganisms -
Durgesh Kumar Tripathi
2018-09-14

Nanomaterials in Plants, Algae and Microorganisms: Concepts and Controversies: Volume 2 not only covers all the new technologies used in the synthesis of nanoparticles, it also tests their response on plants, algae and micro-organisms in aquatic ecosystems. Unlike most works in the field, the

book doesn't focus exclusively on the higher organisms. Instead, it explores the smaller life forms on which they feed. Topics include the impacts of plant development, how different nanoparticles are absorbed by biota, the impact different metals—including silver and rare earth metals—have on living organisms, and the effects nanoparticles have on aquatic ecosystems as a whole. As nanotechnology based products have become a trillion-dollar industry, there is a need to understand the implications to the health of our biota and ecosystems as the earth is increasingly inundated with these materials. Covers the issues of nanoparticles on more simple organisms and their ecosystems Draws upon global experts to help increase understanding of the interface mechanisms at the physiological, biochemical, molecular, and even genomic and proteomic level between ENPs and biological systems Provides a critical assessment of the progress taking place on this topic Sheds light on

future research needs and scientific challenges that still exist in nanoparticle and living organism interactions

Multifunctional Oxide-Based Materials: From Synthesis to Application - Teofil

Jesionowski 2019-09-03

The book deals with novel aspects and perspectives in metal oxide and hybrid material fabrication. The contributions are mainly focused on the search for a new group of advanced materials with designed physicochemical properties, especially an expanded porous structure and defined surface activity. The proposed technological procedures result in an enhanced activity of the synthesized hybrid materials, which is of great importance when considering their potential fields of application. The use of such materials in different technological disciplines, including aspects associated with environmental protection, allows for the verification of the proposed synthesis method. Thus, it can be stated that those aspects

are of interdisciplinary character and may be located at the interface of three scientific disciplines—chemistry, materials science, and engineering—as well as environmental protection. Furthermore, the presented scientific scope is in some way an answer to the continuous demand for such types of materials and opens new perspectives for their practical use

Effect of Zinc Oxide Nanoparticles on Listeria Monocytogenes in Ready-to-Eat Meat - Mohamed Etman et al. 2015-04-21

Scientific Study from the year 2015 in the subject Nutritional Science, , course: Meat Hygiene, language: English, abstract: The purpose of this study was investigation of the effect of zinc oxide nanoparticles (Zn O NPs) on Listeria monocytogenes in Ready-to-eat meat products, to introduce a new, cheap, safe and fast way of food preservation. This work was performed on 240 Random Samples of RTE meat products (Frankfurter, Salami, Basterma & Luncheon) (60

sample of each product). There was a significant increase in Listeria monocytogenes CFU/g in the 1st control group of each product which was not treated by any concentration of Zn O NPs, while in the 2nd group of each product which was treated with 60 ppm of Zn O NPs, there was some inhibition of CFU/g , and in the 3rd group of each product which was treated with 90 ppm of Zn O NPs, there was a significant inhibition which is matching with the highest concentration of Zn O NPs used in this study .

Nanomaterial Biointeractions at the Cellular, Organismal and System Levels -

Nilesh Sharma 2021-03-26

The range of nanomaterial applications has expanded recently from catalysis, electronics, and filtration to therapeutics, diagnostics, agriculture, and food because of unique properties and potentials of different nanoparticles and nanomaterials. Research shows that these exquisite particles can interact with an organism at the cellular, physiological,

biochemical, and molecular levels. However, our knowledge of how they affect these changes, selectively or generally, in diverse organism or ecosystems is very limited and far from satisfactory. Data indicate that the biological function largely depends on the shape, size, and surface characteristics of the nanoparticles used besides life cycle stages of an organism. Therefore, this compilation will focus on the body of work carried out by distinguished investigators using diverse nanomaterials and plant and animal species. This book includes specific case studies as well as general review articles highlighting aspects of multilayered interactions, and targets not only research and academic scholars but also the concerned industry and policy makers as well.

Advances in Poultry Nutrition Research - Amlan Kumar Patra 2021-07-07

Due to the wide acceptance of poultry meat and eggs, poultry farming is the fastest growing global livestock industry. Nutrition plays a vital role in economic production and the maintenance of proper poultry health. Therefore, there is a great need to update balanced nutrient requirements for new breeds, utilize alternative feed resources, evaluate newer feed additives to optimize production while excluding antimicrobial feed additives and maintain overall health. The first section of this book contains six chapters that discuss the utilization of unconventional feeds, nanominerals to reduce mineral proportions in diets, and water intake affected by environmental temperature. The second section contains six chapters that describe proper nutritional management to improve gut health and immunity, the prevention of common diseases, and the amelioration of heat stress in poultry.