Vegetable Fiber Composites and their Technological Applications

Soil borne diseases which are caused to various plants include a wide variety of soil microbes like fungi and bacteria, among which Fusarium wilt is one such disease caused by Fusarium oxysporum cubense in banana plants. With disease or the panama disease of plant is among the most destructive disease of banana in the tropics and even the control methods like field sanitation, soil treatments and crop rotations have not been a long term control for this disease. An alternative method of treating Fusarium oxysporum was adopted by using various banana plants mainly its pusa, pala sap and its later varieties such as Robusta (B1) Musa acuminate Colla (AAA), Pusa sap (B2) Musa x paradisica (AAB), Pandu (B3) Musa x paradisica (AAB), Pandu 1 (B4) Musa x paradisica (AAB), Pandu 2 (B5) Musa x paradisica (AAB). The book presents a variety of banana varieties for disease control. 

Applications of Nanotechnology for Green Synthesis

Green Nanotechnology

This book presents a variety of banana varieties for disease control. 

Vegetable Fiber Composites and their Technological Applications

The last two decades have seen electrospraying of nanofibers performed mainly from solutions of toxic organic solvents. The increase in demand for scalpel electrospraying in recent years therefore requires an environmentally friendly process free of organic solvents. This book addresses techniques for clean and safe electrospraying in the fabrication of green nanofibers and their potential applications.

Green Processes for Nanotechnology

The book provides a broad overview of techniques for medical, analytical, environmental, and organic chemistry applications. It presents an accessible overview of new innovations in the field, dissecting the highlights and green chemistry attributes of approaches to green synthesis, and provides cues to evils applications to pharmaceutical and organic chemistry. Although daily chemical processes are a major part of the sustainable development of pharmaceuticals and industrial products, the resulting environmental pollution of these processes is of worldwide concern. This edition discusses green chemistry techniques and sustainable processes involved in synthetic organic chemistry, natural products, drug syntheses, reflecting on techniques for a broad range of compounds and materials. It highlights sustainable and green chemistry pathways for molecular synthesis.
Green Chemistry Applications

Green Nanomaterials for Industrial Applications explores the applications of nanomaterials for a variety of industry sectors, along with their environmental impacts. This book brings together the industrial applications of nanomaterials, covering new trends and challenges. Significant progress in the green synthesis and environmental impacts of synthesis routes are also explored. As major industrial applications include agriculture, medicine, communications, construction, energy, and in the military, this includes an important information source for those in research and development who want to gain a greater understanding of how nanotechnology is being used to create cheaper, more efficient products. Green nanomaterials have significant advantages including low cost, high efficiency, neutral environmental impact, and stability. Green Nanomaterials for Industrial Applications provides comprehensive information about green nanomaterials, their synthesis, and methods for characterization as well as their properties. Furthermore, this book also provides the necessary background on the broad range of applications for various industrial sectors at both experimental and theoretical models scales. This book is an important reference source for materials scientists, engineers, and environmental scientists who want to learn more about how sustainable nanomaterials are being used in a range of industrial applications. Explores industrial scale fabrication of green nanomaterials. Assesses environmental, legal, health and safety aspects. Discusses how green nanomaterials can be manufactured on an industrial scale.

Nanostructures for Antimicrobial Therapy

Scientific interest in TiO2-based materials has exponentially grown in the last few decades. Titanium Dioxide (TiO2) and its applications introduces the main physicochemical properties of TiO2 which are the basis of its applications in various fields. While the basic principles of the TiO2 properties have been the subject of various previous publications, this book is mainly devoted to TiO2 applications. The book includes contributions written by experts from a wide range of disciplines in order to address titanium dioxide's utilization in energy, consumer, materials, devices, and catalytic applications. The various applications identified include: photocatalysis, electrochemistry, electronics, energy storage and production, ceramics, pigments, cosmetics, sensors, and heat transfer. Titanium Dioxide (TiO2) and its Applications is suitable for a wide readership in the disciplines of materials science, chemistry, and engineering in both academia and industry. Includes a wide range of current and emerging applications of titanium dioxide in the fields of energy, consumer applications, materials, and devices. Provides a brief overview of titanium dioxide and its properties, as well as techniques to design, deposit, and study the material. Discusses the relevant properties, preparation methods, and other appropriate considerations in each application-focused chapter.

Cadmium based II-VI Semiconducting Nanomaterials

This book introduces the principles and mechanisms of the biological synthesis of nanomaterials from microorganisms, including bacteria, fungi, viruses, algae, and protozoans. It presents optimization processes for synthesis of microbes-mediated nanoparticles. The book also reviews the industrial and agricultural applications of microbially-synthesized nanoparticles. It also presents the medical applications of green nanoparticles, such as treating multidrug-resistant pathogens and cancer treatment. Further, it examines the advantages and prospects for the synthesis of nanoparticles by microorganisms. Lastly, it also presents the utilization of microbial-synthesized nanoparticles in the biomedical field of heavy metals.

Green Nanomaterials for Industrial Applications

This book explores various nanotechnology applications and their effect on the food industry: innovation and environmental issues. Nanotechnology has had a major impact on the food industry and the environment in recent years: it has increased the nutritional and functional properties of a number of food products, food packaging, food quality, crop protection, plant nutrient management, and the food industry through the introduction of food diagnostics.

Handbook of Research on Green Synthesis and Applications of Nanomaterials

Nanostructures for Antimicrobial Therapy discusses the pros and cons of the use of nanomaterials in the eradication and eradication of infections. It highlights the efficient microbial effectiveness of nanoparticles against antibiotic-resistant pathogens and biofilms. Conventional antibiotics are becoming ineffective towards microorganisms making nanomaterials, due to the development of antibiotic resistance in microorganisms is increasingly being reported. New approaches are needed to confront the rising issues related to infectious diseases. The merging of biomaterials, such as chitosan, carboxymethyl gelatin, poly (lactic-co-glycolic acid) with nanotechnology provides a platform for antimicrobial therapy as it provides a controlled way to target cells and induce the desired response without the adverse effects common to many traditional treatments. Nanomaterials represent one of the most promising therapeutic treatments to the problematic infections caused by antibiotic-resistant microorganisms. The use of nanoparticles makes it possible to develop a larger number of antimicrobial agents with reduced risk of resistance to traditional therapies. This volume discusses this promise in detail, and also discusses what challenges the greater use of nanoparticles might pose to medical professionals. The unique physicochemical properties of nanoparticles, combined with their growth inhibition capacity, against microbes has led to the upsurge in the research on nanoparticles as antimicrobials. The importance of bacterial nanomaterials study will likely increase as development of resistant strains of bacteria against most potent antibiotics continues. Shows how nanoantibiotics can be used to more effectively treat disease. Discusses the advantages and issues of a variety of different nanobioreactors, enabling medics to select which best meets their needs. Provides a cogent summary of recent developments in this field, allowing readers to quickly familiarize themselves with this topic area.

Green synthesis of copper and zinc nanoparticles using different varieties of banana starch, latex and sap and evaluation of their antifungal activity against Fusarium oxysporum cubense

This edited book focuses on green chemistry as the research community embarks to create eco-friendly materials and technologies. It provides an in-depth overview of the fundamentals, key concepts and experimental techniques for eco-friendly synthesis of organic compounds and metal/metal oxide nanoparticles and nanomaterials. It also emphasizes the mechanisms, designing and industrial technologies for green synthesis and its applications. Each chapter brings the recent developments, state of the art, challenges and perspectives which cover all the aspects in one place, and which concern the green synthesis and evaluation. Authored by world-renowned experts in a broad range of green chemistry sectors, this book is an archival reference guide for researchers, engineers, scientists and postgraduates working in the field of sustainable science, green chemistry, environmental science, engineering sciences and industrial technologies.

Nanotechnology

Biological Synthesis of Nanoparticles and Their Applications gives insight into the synthesis of nanoparticles from microorganisms, including bacteria, fungi, viruses, algae, and protozoans. It also introduces the principles and mechanisms of the biological synthesis of nanomaterials from microorganisms, including bacteria, fungi, viruses, algae, and protozoans. It provides an in-depth overview of the fundamental concepts and experimental techniques for eco-friendly synthesis of organic compounds and metal/metal oxide nanoparticles and nanomaterials. It also emphasizes the mechanisms, designing and industrial technologies for green synthesis and its applications. Each chapter brings the recent developments, state of the art, challenges and perspectives which cover all the aspects in one place, and which concern the green synthesis and evaluation. Authored by world-renowned experts in a broad range of green chemistry sectors, this book is an archival reference guide for researchers, engineers, scientists and postgraduates working in the field of sustainable science, green chemistry, environmental science, engineering sciences and industrial technologies.

Sustainable Nanocellulose and Nanohydrogens from Natural Sources

This book describes various strategies for the synthesis of green nanoparticles using plant extracts and microalgae, including the advantages and disadvantages of different methods and their applications. After discussing strategies for the potential green synthesis of noble metal nanoparticles, it highlights the role of the solvent system. The book then explores the stability/tokicity of nanoparticles and the associated surface engineering techniques for achieving biocompatibility, and examines the antimicrobial efficacy of green nanoparticles with regard to various bacterial pathogens, as well as the underlying cytotoxicity mechanisms. Lastly, the book addresses the potential applications of various green nanoparticles in cancer theranostics, and reviews a series of plant-mediated nanoparticles as potential pharmaceutical agents. Given its scope, the book will be of interest to all scientists and students wanting to learn more about the synthesis and applications of green nanoparticles.

Biosynthesized Nanomaterials

Green synthesis of copper and zinc nanoparticles using different varieties of banana starch, latex and sap and evaluation of their antifungal activity against Fusarium oxysporum cubense

This book covers various strategies for the synthesis of green nanoparticles using plant extracts and microalgae, including the advantages and disadvantages of different methods and their applications. After discussing strategies for the potential green synthesis of noble metal nanoparticles, it highlights the role of the solvent system. The book then explores the stability/tokicity of nanoparticles and the associated surface engineering techniques for achieving biocompatibility, and examines the antimicrobial efficacy of green nanoparticles with regard to various bacterial pathogens, as well as the underlying cytotoxicity mechanisms. Lastly, the book addresses the potential applications of various green nanoparticles in cancer theranostics, and reviews a series of plant-mediated nanoparticles as potential pharmaceutical agents. Given its scope, the book will be of interest to all scientists and students wanting to learn more about the synthesis and applications of green nanoparticles.

Green and Sustainable Advanced Materials

This book provides the state-of-the-art survey of green technologies in preparation of different classes of nanomaterials, with an emphasis on the use of renewable sources. Key topics covered include fabrication of nanomaterials using green techniques as well as their properties and applications, the use of renewable sources to obtain nanomaterials of different classes, from simple metal and metal oxide nanoparticles to complex bionspired nanomaterials, economic contributions of nanotechnology to green and sustainable growth, and more. This is an ideal book for students, lecturers, researchers and engineers dealing with versatile (mainly chemical, biological, and medical) aspects of nanotechnology, including fabrication of nanomaterials using green techniques and their properties and applications.

Advances in Green Synthesis

This book introduces the principles and mechanisms of the biological synthesis of nanomaterials from microorganisms, including bacteria, fungi, viruses, algae, and protozoans. It provides an in-depth overview of the fundamental concepts and experimental techniques for eco-friendly synthesis of organic compounds and metal/metal oxide nanoparticles and nanomaterials. It also emphasizes the mechanisms, designing and industrial technologies for green synthesis and its applications. Each chapter brings the recent developments, state of the art, challenges and perspectives which cover all the aspects in one place, and which concern the green synthesis and evaluation. Authored by world-renowned experts in a broad range of green chemistry sectors, this book is an archival reference guide for researchers, engineers, scientists and postgraduates working in the field of sustainable science, green chemistry, environmental science, engineering sciences and industrial technologies.
Green Synthesis of Silver Nanomaterials

Sustainable development is a very prevalent concept of modern society. This concept has appeared as a critical force in the formation of growth and development by maintaining a balance of using human resources and the ecosystem in which we are living. The development of new and advanced materials is one of the priorities of the modern society concept. Green nanomaterial has superior and special properties. These fulfills today’s growing demand for equipment, machines and devices with better quality for an extensive range of applications in various sectors such as paper, biotextile, textile, and much more. Volume 1 gives overview on a variety of topics of characterization of green and sustainable advanced materials including biopolymers, biocomposites, nanomaterials, polymeric materials, green functional textiles materials and hybrid materials, as well as processing chapters on the design and process aspects of nanofabrication.

Nanomaterials and Nanocomposites

Green Synthesis, Characterization and Applications of Nanoparticles shows how eco-friendly nanoparticles are engineered and used. In particular, metal nanoparticles, metal oxide nanoparticles and other categories of nanoparticles are discussed. The book outlines a range of methodologies and explores the appropriate use of each. Characterization methods include spectrophotometric, microscopic and diffraction methods, but magnetic resonance methods are also included as they can be used to understand the mechanism of nanoparticle synthesis using organisms. Applications covered include targeted drug delivery, water purification and hydrogen generation. This is an important research resource for those wishing to learn more about how eco-efficient nanoparticles can be best used. Theoretical details and mathematical derivations are kept to a minimum to suit the need of interdisciplinary audiences and those who may be relatively new to the field. Explore recorded grounds in growth, characterization, properties and applications of nanoparticles gives readers an understanding on how they are applied through the use of case studies and examples. Includes the advantages and disadvantages of a variety of synthesis and characterization techniques for green nanoparticles in different situations.

Biological Synthesis of Nanoparticles and Their Applications

The book provides a thorough survey of current topics in quantum dots synthesis, properties, and applications. The unique properties of these new nanomaterials offer multifunctional applications in such fields as photovoltaics, light-emitting diodes, field-effect transistors, lasers, photodetectors, solar cells, biomedical diagnostics and quantum computing. Keywords: Quantum Dots (QDs), Photovoltaics, Light-emitting Diodes, Field-effect Transistors, Lasers, Photodetectors, Solar Cells, Biomedical Diagnostics, Quantum Computing.

Quantum Dots

Covering fundamentals through applications, this book discusses environmentally friendly polymer nanocomposites and alternatives to traditional nanocomposites through detailed reviews of a variety of materials procured from different resources, their synthesis, and applications using alternative green approaches. The text discusses green polymeric nanocomposites that can be improved with design considerations in terms of biodegradability, biocompatibility, and biodegradability. Synthesis, practical tools for nanomaterials gives readers an understanding on how they are applied through the use of case studies and examples. Includes the advantages and disadvantages of a variety of synthesis and characterization techniques for green nanoparticles in different situations.

Titanium Dioxide (TiO2) and its Applications

This book highlights the complexity of spinel nanoparticles, their synthesis, physico-chemical properties and prospective applications in the area of advanced electronics, microwave devices, biotechnology as well as biomedical sciences. It presents an overview of spinel nanoparticles: synthesis, properties and applications for a wide audience of students, researchers, and engineers in the biomedical, pharmaceutical, and nanotechnology fields. The last section of the book highlights the importance of this class of nanomaterials in the field of biotechnology and biomedical sector with a special chapter on water purification.

Green Nanomaterials

This is the second volume on Environmental Nanotechnology. The first chapter discusses the synthesis of nanomaterial and mainly the green synthesis of inorganic nanomaterials. Furthermore, a comparative discussion about resistive and capacitive measurement of nano-based biosensor is reviewed and the efficient delivery of nucleic acid with the help of nano-vehicles is explained. Moreover, the book also includes reviews on such topics as nanopharaceuticals, health benefits and the toxic impact of heavy metal nanomaterials and the impact of several nanomaterials on plant abiotic stress and have focussed on the long term impacts of nanomaterials on plant abiotic stress and have focussed on the long term impacts of nanomaterials on plant abiotic stress and have focussed on the long term impacts of nanomaterials on plant abiotic stress and have focussed on the long term impacts of nanomaterials on plant abiotic stress and have focussed on the long term impacts of nanomaterials on plant abiotic stress and have focussed on the long term impacts of nanomaterials on plant abiotic stress and have focussed on the long term impacts of nanomaterials on plant abiotic stress and have focussed on the long term impacts of nanomaterials on plant abiotic stress and have focussed on the long term impacts of nanomaterials on plant abiotic stress and have focussed on the long term impacts of nanomaterials on plant abiotic stress and have focussed on the long term impacts of nanomaterials on plant abiotic stress and have focussed on the long term impacts of nanomaterials on plant abiotic stress and have focussed on the long term impacts of nanomaterials on plant abiotic stress and have focussed on the long term impacts of nanomaterials on plant abiotic stress and have focussed on the long term impacts of nanomaterials on plant abiotic stress and have focussed on the long term impacts of nanomaterials on plant abiotic stress.

Green Synthesis, Characterization and Applications of Nanoparticles

Green chemistry is defined as the use of a dozen principles that reduce or eliminate hazardous materials in the design, manufacture, and use of chemical products. Today, it is understood that focusing on precautions to reduce or eliminate existing pollution sources is more effective than looking for a cleaning path after exiting. This book presents the principles of green chemistry for clean production in light of the latest technological developments and increasing environmental awareness. Chapters cover such topics as synthesis and applications of nanomaterials for energy and environmental applications, climate process, alternative green energy sources, and removal of emerging pollutants from water.

Green Photo-active Nanomaterials

This book provides technological perspective and comprehensive overview on the research efforts related to biV-gas group cadmium based semiconductor nanomaterials, it describes state-of-the-art information on different synthesis methods for preparation of these materials using a variety of experimental strategies. The effects of synthesis roots on structural, thermal, mechanical, lattice vibronic, electronic, optical and carrier transport characteristics of these nano-structures are systematically analyzed. A wide target readership comprising of students, researchers, scholars, scientists, technicians, academicians, industrialists can benefit from this book as cadmium based semiconductors possess significant research and industrial interest thanks to their innovative properties.

Green Electrospinning

The main aims of this book are to summarize the fundamentals, synthesis methods, properties and applications of nanomaterials, so as to provide readers with a systematic knowledge on nanomaterials. In addition, the book covers mainly used characterization tools pertaining to nanomaterials. Further, it deals with relevant aspects of nanomaterials which contains dispersion of nano-sized particles, and carbon nanotubes (CNTs) in the matrices (polymer, metal and ceramic). It also discusses development of smart nano textiles (intelligent textiles), self-cleaning glass, sensors, actuators, ferro-fluids, and wear resistant nano-coatings.

Environmental Nanotechnology

The use of biological sources such as microbes and plants can help in synthesizing nanoparticles in a reliable and eco-friendly way. The synthesis of nanoparticles by these natural sources is characterized by processes that take place near to ambient temperature and pressures and also near neutral pH. This edition volume authored by subject specialists, provides all the latest research and builds a database of biofabrication agents to various metal nanoparticles using different precursor systems. The book also highlights the different strategies such as simplicity, cost-effectiveness, environment-friendly and easily scalable, and includes parameters for controlling the size and shape of the materials developed from the various green methods. In order to exploit the utmost potential metal nanoparticles synthesis from the different sources such as agricultural waste, flora and fauna, food waste, microbes and microbe polymers systems, it is also crucial to recognize the biochemical and molecular mechanisms of production of nanoparticles and their characterization.

Handbook of Green Synthesis of Nanomaterials and Compounds

Nanomaterials possess astonishing physical and chemical properties. They play a key role in the development of novel and effective drugs, catalysts, sensors, and nanotechnologies, to cite just a few examples. Notably, the synthesis of nanomaterials is usually achieved with chemical and physical methods needing the use of extremely
Green Polymeric Nanocomposites

CAG series highlights new advances in the current advances in the role of nanoparticles in plant biotechnology. Each chapter is written by international experts in the respective fields. Provides the authority and expertise of leading contributors from an international board of authors. Presents the latest release in the Comprehensive Analytical Chemistry series. Updated release includes the latest information on biosynthesized nanomaterials.

Optical and Molecular Physics

Optical and Molecular Physics: Theoretical Principles and Experimental Methods addresses many important applications and advances in the field. This book is divided into 5 sections: Plasmonics and carbon dots physics with applications, Optical films, fibers, and materials, Optical properties of advanced materials, Molecular physics, and diffusing and Molecular physics. Weaving together science and engineering, this new volume addresses the latest developments in the field of optical and molecular physics. It covers plasmonics and carbon dots physics with applications, optical films, fibers, and materials; optical properties of advanced materials; molecular physics; and diffusion and molecular physics. This book looks at the optical materials in the development of composite materials for the functionalization of glass, ceramic, and polymeric substrates to interact with electromagnetic radiation and presents state-of-the-art research in preparation methods, optical characterization, and usage of optical materials and devices in various photonic fields. The authors discuss devices and technologies used by the electronics, magnets, and photonics industries and offer perspectives on the manufacturing technologies used in device fabrication.

Green Approaches in Medicinal Chemistry for Sustainable Drug Design

Polymer Science and Innovative Applications: Materials, Techniques, and Future Developments introduces the science of innovative polymers and composites, their analysis via experimental techniques and simulation, and their utilization in a variety of application areas. This approach helps to unlock the potential of new materials for product design and other uses. The book also examines the role that these applications play in the human world, from pollution and health impacts, to their potential to make a positive contribution in areas including environmental remediation, medicine and healthcare, and renewable energy. Advantages, disadvantages, possibilities, and challenges relating to the utilization of polymers in human society are included. Presents the latest advanced applications of polymers and their composites and identifies key areas for future development. This book focuses on sustainable drug design.

Green Synthesis of Nanomaterials for Bioenergy Applications

Nanotechnology is the application of science to control matter at the molecular level. It has become one of the most promising applied technologies in all areas of science. Nanoparticles have multi-functional properties and have created very interesting applications in various fields such as medicine, nutrition, bioenergy, agriculture and the environment. But the biogenic synthesis of monodispersed nanoparticles with specific sizes and shapes have been a challenge in biotechnology. Nanoparticles are of great interest due to their extremely small size and large surface-to-volume ratio, which lead to both chemical and physical differences in their properties (e.g., mechanical properties, biological and clinical properties, catalytic activity, thermal and electrical conductivity, optical absorption and melting point) compared to bulk of the same chemical composition. Recently, however, synthesizing metal nanoparticles using green technology via microorganisms, plants, viruses, and so on, has been extensively studied and has become recognized as a green and efficient method for further exploiting biological systems as convenient nanofactories. Thus the biological synthesis of nanoparticles is increasingly regarded as a rapid, eco-friendly, and easily scaled-up technology. Today researchers are developing new techniques and materials using nanotechnology that may be suitable for plants to boost their native functions. Recently, biogenic nanoparticles were found to be more pharmacologically active than physico-chemically synthesized nanoparticles. Various applications of biosynthesized nanoparticles have been discovered, especially in the field of biomedical research, such as applications to specific delivery of drugs, use for tumor detection, angiogenesis, genetic disease and genetic disorder diagnosis, photomagnetism, and photothermal therapy. Further, iron oxide nanoparticles have been applied to cancer therapy, phototherapy, drug delivery, tissue repair, cell labeling, targeting and immunoassays, detection of biological fluids, magnetic resonance imaging, and magnetically responsive drug delivery therapy. Nanotechnology in nanoscale systems for plant hypertropism for biotechnological applications has vast potential. This book offers researchers in plant science and biomedicine the latest research and opportunity to develop new tools for the synthesis of environmentally friendly and cost-effective nanoparticles for applications in biomedicine as well as other various fields.

Ferrite

Sustainable Nanocellulose and Nanohybrids from Natural Sources explores the use of biopolymers in specific application areas such as electronics, energy, consumer goods, packaging materials, textiles, water treatment and engineering, and what makes the particular polymer to engage it in these applications. This is an important reference source for those who would like to learn more about how biopolymeric nanocomposites are used in sustainability and environmental protection. Biopolymers, including plant and sea-based polymers, play an important role in the formation and maintaining the stability of industrial nanocomposites; their commercial use being the surface modification and protection for the highly oxidative-unstable cores, as stable base for holding multiple targets, and as a shield for the inorganic and highly toxic metals. These biopolymer-based nanocomposites are being used in the electronics, automobile, construction and biomaterials sectors. Explains the major design and development techniques of novel biopolymeric nanocomposites demonstrates how nanocellulose and Nanohybrids are being used for environmental health and safety. Explores how biopolymer-infused nanocellulose and nanohybrids are less toxic than their conventional counterparts.

Synthesis Techniques for Polymer Nanocomposites

This book comprises a collection of chapters on advances in green nanomaterials. The book looks at ways to establish long-term safe and sustainable forms of nanotechnology through implementation of nanoparticle biosynthesis with minimum impact on the ecosystem. The book looks at synthesis, processing, and applications of metal and metal oxide nanomaterials and also bio-nanomaterials. The contents of this book will prove useful for researchers and professionals working in the field of nanomaterials and green technology.

Spinel Nanoferrites

An authoritative summary of the quest for an environmentally sustainable synthesis process of nanomaterials and their application for environmental sustainability. Green Synthesis of Nanomaterials for Bioenergy Applications is an important guide that provides information on the fabrication of nanomaterials and the application of low-cost, greener methods. The book also explores the impact on various existing bioenergy approaches. Throughout the hot list of contributors, this book presents a reliable solution of the quest for an environmentally sustainable synthesis process of nanomaterials and their application to the field of environmental sustainability. The green synthesis of nanomaterials process has been widely accepted as a promising technique that can be applied to a variety of fields. The green technology-based production processes to fabricate nanomaterials operates under green conditions without the intervention of toxic chemicals. The book's exploration of more reliable and sustainable processes for the synthesis of nanomaterials, can lead to the commercial application of the economically viably of low-cost biosolid production. This important book summarizes the quest for an environmentally sustainable synthesis process of nanomaterials for their application to the field of environmental sustainability. Offers an alternate, sustainable green energy approach that can be commercially implemented worldwide. Covers recent approaches such as fabrication of nanomaterial that apply low-cost green methods and examines its impact on various existing bioenergy applications. Written for researchers, academics and students of nanotechnology, nanosciences, bioenergy, material science, environmental sciences, and pollution control. Green Synthesis of Nanomaterials for Bioenergy Applications is a must-have guide that covers green synthesis and characterization of nanomaterials for cost-effective bioenergy applications.

Silver Micro-Nanoparticles

Providing up-to-date coverage of green nanomaterials and systems, this book provides comprehensive information on nanomaterials, including their applications in energy and environmental sciences. The book focuses on photo-active nanstructured materials, from the basic understanding of solar energy activation to their sustainable preparation and applications in environmental remediation and fuel production from biomass and carbon dioxide. It also examines the health and environmental impacts of photo-catalytic nanoparticles. This book is an important reference for researchers and industrial chemists working in the fields of energy and environmental remediation.

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