Nanoparticles Nanocomposites Nanomaterials An Introduction For Beginners

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Nanomaterials Springer Nature
Structurally the work is demarcated into the six most popular areas of research: (1) biocompatibility of nanomaterials with living organisms in their various manifestations (2) nanobiosensors for clinical diagnostics, detecting biomolecules which are useful in the clinical diagnosis of genetic, metabolically acquired, induced or infectious disease (3) targeted drug delivery for nanomaterials in their various modifications (4) nanomedical devices and structures which are used in the development of implantable medical devices and structures such as nanorobots (5) nanopharmacology, as novel nanoparticles are increasingly engineered to diagnose conditions and recognize pathogens, identify ideal pharmaceutical agents to treat the condition or pathogens, fuel high-yield production of matched pharmaceuticals (potentially in vivo), locate, attach or enter target tissue,
Nanomaterials for Medical Applications Springer Nature
Nanomaterials and Nanocomposites: Characterization, Processing, and Applications discusses the most recent research in nanomaterials and nanocomposites for a range of applications as well as modern characterization tools and techniques. It deals with nanocomposites that are dispersed with nanosized particulates and carbon nanotubes in their matrices (polymer, metal, and ceramic). In addition, the work: Describes different nanomaterials, such as metal and metal oxides, clay and POSS, carbon nanotubes, cellulose, and biobased polymers in a structured manner Examines the processing of carbon nanotube-based nanocomposites, layered double hydroxides, and cellulose nanoparticles as functional fillers and reinforcement materials Covers size effect on thermal, mechanical, optical, magnetic, and electrical properties Details machining and joining aspects of nanocomposites Discusses the development of smart nanotextiles (intelligent textiles), self-cleaning glass, sensors, actuators, ferrofluids, and wear-resistant nanocoatings. This book enables an efficient comparison of properties and capabilities of these advanced materials, making it relevant for materials scientists and chemical engineers conducting academic research and industrial R&D into nanomaterial processing and applications.
Nanomaterials and Nanocomposites John Wiley & Sons
Polymer Nanocomposite Materials Discover an authoritative overview of zero-, one-, and two-dimensional polymer nanomaterials Polymer Nanocomposite Materials: Applications in Integrated Electronic Devices delivers an original and insightful treatment of polymer nanocomposite applications in energy, information, and biotechnology. The book systematically reviews the preparation and characterization of polymer nanocomposites from zero-, one-, and two-dimensional nanomaterials. The two distinguished editors have selected resources that thoroughly explore the applications of polymer nanocomposites in energy, information, and biotechnology devices like sensors, solar cells, data storage devices, and artificial synapses. Academic researchers and professional developers alike will enjoy one of the first books on the subject of this environmentally friendly and versatile new technology. Polymer Nanocomposite Materials discusses challenges associated with the devices and materials, possible

strategies for future directions of the technology, and the possible commercial applications of electronic devices built on these materials. Readers will also benefit from the inclusion of: A thorough introduction to the fabrication of conductive polymer composites and their applications in sensors An exploration of biodegradable polymer nanocomposites for electronics and polymer nanocomposites for photodetectors Practical discussions of polymer nanocomposites for pressure sensors and the application of polymer nanocomposites in energy storage devices An examination of functional polymer nanocomposites for triboelectric nanogenerators and resistive switching memory Perfect for materials scientists and polymer chemists, Polymer Nanocomposite Materials: Applications in Integrated Electronic Devices will also earn a place in the libraries of sensor developers, electrical engineers, and other professionals working in the sensor industry seeking an authoritative one-stop reference for nanocomposite applications.

Handbook of Nanomaterials and Nanocomposites for Energy and Environmental Applications John Wiley & Sons

Engineered nanopolymer and nanoparticles, with their extraordinary mechanical and unique electronic properties, have garnered much attention in recent years. With a broad range of potential applications, including nanoelectronics, composites, chemical sensors, biosensors, microscopy, nanoelectromechanical systems, and many more, the scientific comm

Two-dimensional Inorganic Nanomaterials for Conductive Polymer Nanocomposites John Wiley & Sons

Nanomaterials for Biosensors: Fundamentals and Applications provides a detailed summary of the main nanomaterials used in biosensing and their application. It covers recent developments in nanomaterials for the fabrication of biosensor devices for healthcare diagnostics, food freshness and bioprocessing. The various processes used for synthesis and characterization of nanostructured materials are examined, along with the design and fabrication of bioelectronic devices using nanostructured materials as building blocks. Users will find the fundamentals of the main nanomaterials used in biosensing, helping them visualize a systematic and coherent picture of how nanomaterials are used in biosensors. The book also addresses the role of bio-conjugation of nanomaterials in the construction of nano-biointerfaces for application in biosensors. Such applications, including metal nanoparticles, metal oxide nanoparticles, nanocomposites, carbon nanotubes, conducting polymers and plasmonic nanostructures in biosensing are discussed relative to each nanomaterial concerned. Finally, recent advancements in protein functionalized nanomaterials for cancer diagnostics and bio-imaging are also included. - Provides a detailed study on how nanomaterials are used to enhance sensing capabilities in biosensors - Explains the properties, characterization methods and preparation techniques of the nanomaterials used in biosensing - Arranged in a material-by-material way, making it clear how each nanomaterial should be used

Polymer Nanocomposites Based on Silver Nanoparticles Woodhead Publishing

This book focuses on polymer/silver nanocomposites as the main component in bioengineering systems. It describes in detail the synthesis and characterization (morphological, thermal, mechanical & dynamic mechanical properties), as well as the different applications of these composites. A special chapter is dedicated to the toxicity aspects of silver nanoparticles

Nanomaterials and Nanocomposites Elsevier

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 at bio-nanomaterials. The contents of this book will prove useful for researchers and professionals working in the field of nanomaterials and green technology.

Processing of Polymer-based Nanocomposites Woodhead Publishing

Written by a bestselling author and expert in nanochemistry, this title is ideal for interdisciplinary courses in chemistry, materials science, or physics.

Introduction to Nanoscale Science and Technology John Wiley & Sons

It has been almost thirty years since the publication of a book that is entirely dedicated to the theory, description, characterization and measurement of the thermal conductivity of solids. The recent discovery of new materials which possess more complex crystal structures and thus more complicated phonon scattering mechanisms have brought innovative challenges to the theory and experimental understanding of these new materials. With the development of new and novel solid materials and new measurement techniques, this book will serve as a current and extensive resource to the next generation researchers in the field of thermal conductivity. This book is a valuable resource for research groups and special topics courses (8-10 students), for 1st or 2nd year graduate level courses in Thermal Properties of Solids, special topics courses in Thermal Conductivity, Superconductors and Magnetic Materials, and to researchers in Thermoelectrics, Thermal Barrier Materials and Solid State Physics.

Nanomaterials and Nanocomposites CRC Press

"Part of this book adapted from "Introduction aux nanosciences et aux nanotechnologies" published in France by Hermes Science/Lavoisier in 2006."

Novel Nanomaterials for Biomedical, Environmental and Energy Applications John Wiley & Sons

Novel nanoscale materials are now an essential part of meeting the current and future needs for clean water, and are at the heart of the development of novel technologies to desalinate water. The unique properties of nanomaterials and their convergence with current treatment technologies present great opportunities to revolutionize water and wastewater treatment. Nanoscale Materials for Water Purification brings together sustainable solutions using novel nanomaterials to alleviate the physical effects of water scarcity. This book covers a wide range of nanomaterials, including noble metal nanoparticles, magnetic nanoparticles, dendrimers, bioactive nanoparticles, polysaccharidebased nanoparticles, nanocatalysts, and redox nanoparticles for water purification. Significant properties and characterization methods of nanomaterials such as surface morphology, mechanical properties, and adsorption capacities are also investigated - Explains how the unique properties of a range of nanomaterials makes them important water purification agents - Shows how the use of nanotechnology can help create cheaper, more reliable, less energy-intensive, more environmentally friendly water purification techniques - Includes case studies to show how nanotechnology has successfully been integrated into water purification system design

Green Biosynthesis of Nanoparticles CRC Press

Novel Nanomaterials for Biomedical, Environmental, and Energy Applications is a comprehensive study on the cutting-edge progress in the synthesis and characterization of novel nanomaterials and their subsequent advances and uses in biomedical, environmental and energy applications. Covering novel concepts and key points of interest, this book explores the frontier applications of nanomaterials. Chapters discuss the overall progress of novel nanomaterial applications in the biomedical, environmental and energy fields, introduce the synthesis, characterization, properties and applications of novel nanomaterials, discuss biomedical applications, and cover the electrocatalytical and photothermal effects of novel nanomaterials for efficient energy applications. The book will be invaluable to academic researchers and biomedical clinicians working with nanomaterials. - Offers comprehensive details on novel and emerging nanomaterials - Presents a comprehensive view of new and emerging tactics for the synthesis of efficient nanomaterials - Describes and monitors the functions of applications of new and emerging nanomaterials in the biomedical, environmental and energy fields

Research Anthology on Synthesis, Characterization, and Applications of Nanomaterials McGraw Hill Professional

There are physical and chemical methods of synthesis of nanomaterials. But due to the damage caused by these methods to the environment there is a pressing need of green nanotechnology, which is a clean and eco-friendly technology for the development of nanomaterials. The present book includes green synthesis of nanoparticles by algae, diatoms and plants. The mechanism behind the synthesis of nanoparticles will also be discussed. The book would be a valuable resource for students, researchers and teachers of biology, chemistry, chemical technology, nanotechnology, microbial technology and those who are interested in green nanotechnology.

Health and Environmental Safety of Nanomaterials Springer Nature

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 most commonly used characterization tools pertaining to nanomaterials. Further, it deals with relevant aspects of nanocomposites which contains dispersion of nano-sized particulates, 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. Aimed at senior undergraduate and graduate students, the key features on this book include: Top-down and bottom-up approaches for the synthesis of nanomaterials included Illustrates sample preparation and basic principle of characterization tools for nanomaterials Explains calculation of ratios of surface area to volume and surface atoms to bulk atoms Reviews synthesis, properties and applications of carbon nanotubes and magnetic nanomaterials Discusses size effect on thermal, mechanical, optical, magnetic and electrical properties

Nanostructures, Nanomaterials, and Nanotechnologies to Nanoindustry Cambridge University Press

How could nanotechnology not perk the interest of any designer, engineer or architect? Exploring the intriguing new approaches to design that nanotechnologies offer, Nanomaterials, Nanotechnologies and Design is set against the sometimes fantastic sounding potential of this technology. Nanotechnology offers product engineers, designers, architects and consumers a vastly enhanced palette of materials and properties, ranging from the profound to the superficial. It is for engineering and design students and professionals who need to understand enough about the subject to apply it with real meaning to their own work. - World-renowned author team address the hot-topic of nanotechnology - The first book to address and explore the impacts and opportunities of nanotech for mainstream designers, engineers and architects - Full colour production and excellent design: guaranteed to appeal to everyone concerned with good design and the use of new materials

Emerging Technologies for Nanoparticle Manufacturing Springer Science & Business Media

Nanomaterials-Based Coatings: Fundamentals and Applications presents the fundamental concepts and applications of nanomaterial-based coatings in anticorrosion, antiwear, antibacterial, antifungal, self-cleaning, superhydrophobic, super hard, super heat resistance, solar reflective, photocatalytic and radar absorbing coatings. It is an important resource for those seeking to understand the underlying phenomenal and fundamental mechanisms through which nanoparticles interact with polymeric and metallic matrices to create stronger coatings. As nanomaterials-enforced coatings are smarter, stronger and more durable, the information listed in this book will helps readers understand their usage and further applications.

Nanomaterials-Based Coatings John Wiley & Sons

This is the 2nd edition of the original “Nanostructures and Nanomaterials” written by Guozhong Cao and published by Imperial College Press in 2004.This important book focuses not only on the synthesis and fabrication of nanostructures and nanomaterials, but also includes properties and applications of nanostructures and nanomaterials, particularly inorganic nanomaterials. It provides balanced and comprehensive coverage of the fundamentals and processing techniques with regard to synthesis, characterization, properties, and applications of nanostructures and nanomaterials. Both chemical processing and lithographic techniques are presented in a systematic and coherent manner for the synthesis and fabrication of 0-D, 1-D, and 2-D nanostructures, as well as special nanomaterials such as carbon nanotubes and ordered mesoporous oxides. The book will serve as a general introduction to nanomaterials and nanotechnology for teaching and self-study purposes.

Polymer Composites with Functionalized Nanoparticles Royal Society of Chemistry

"This reference of contributed chapters seeks to address not only how nanomaterials are created, used, or characterized, but also to apply this knowledge to the multidimensional industries, fields, and applications of nanomaterials and nanoscience by including topics such as both natural and manmade nanomaterials; the size, shape, reactivity, and other essential characteristics of nanomaterials; challenges and potential effects of using nanomaterials; and the advantages of nanomaterials with multidisciplinary uses"--

Prussian Blue-Type Nanoparticles and Nanocomposites CRC Press

This book highlights the synthesis, chemistry and applications of two-dimensional (2D) inorganic nanoplatelets in polymer nanocomposites.

Nanoparticles - Nanocomposites Nanomaterials Elsevier

Dieses klar strukturierte Fachbuch legt den Schwerpunkt auf praktische Anwendungen von Nanokompositen und Nanotechnologien im Rahmen einer nachhaltigen Entwicklung. Es zeigt, wie Nanokomposite zur Lösung von Energie- und Umweltproblemen beitragen können, bietet zusätzlich einen breiten Überblick über Anwendungen im Energiebereich und behandelt eine einzigartige Auswahl an Umweltthemen. Der erste Teil beschäftigt sich mit Anwendungen wie Lithium-Ionen-Batterien, Solarzellen, Katalyse, Gewinnung von Wärme und Energie aus Abfällen mithilfe der Thermoelektrizität und Wasserspaltung. Der zweite Teil beleuchtet in einzigartiger Weise ökologische Themen, darunter Atommüllmanagement sowie die Abscheidung

und Speicherung von Kohlendioxid. Dieses Fachbuch vermittelt auf erfolgreiche Weise Grundlagenwissen für Einsteiger als auch die neuesten Erkenntnisse für erfahrene Wissenschaftler, Ingenieure und Forscher aus der Industrie.

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