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 Engineered Carbon Nanotubes and Nanofibrous Material
 Advanced Fuzzy Logic Approaches in Engineering Science

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ALVARADO KATELYN

British Journal of Applied Physics CRC Press
 The world faces significant challenges as the population and consumption continue to grow while nonrenewable fossil fuels and other raw materials are depleted at ever-increasing rates. Moreover, environmental consciousness and a penchant for thinking in terms of material cycles have caught on with consumers: the use of environmentally compatible materials and production methods is desired. This volume, *Green Materials and Environmental Chemistry: New Production Technologies, Unique Properties, and Applications* takes a technical approach to address these issues using green design and analysis. This book provides an overview of the latest developments in environmental chemistry and sustainable materials written by experts in their respective research areas. This interdisciplinary volume offers research with the aim to minimize environmental impacts across all lifecycle phases in the design and engineering of products, processes, and systems as just one possible

approach to addressing the larger issue of sustainability that includes environmental, economic, and social aspects.

Nanofluidics Springer Science & Business Media

This book provides a full analytical overview of the establishment and functioning of the Special Tribunal for Lebanon, the newest and most controversial of the UN-sponsored international criminal courts. In 2005, Lebanese Prime Minister Rafic Hariri was assassinated in a huge blast that reverberated across Lebanon and the region. The Tribunal was established with a mandate to try the perpetrators of the Hariri killing, as well as those responsible for other killings that are 'connected' to this core crime. Individuals associated with the Hezbollah group have been indicted to be tried in the court in The Hague-but in their absence as their locations are unknown. The Tribunal is the UN's first attempt at addressing terrorism in an international criminal court, and the first attempt to set up international trials following crimes committed in the Middle East region. The court's narrow mandate and unique procedures have led many to question what kind of precedent it will set in a volatile region. This book looks at how the court was established, its foundational principles based on the Statute of the International Criminal Court and Lebanese

domestic law, and the possible further development of its case law. It provides an authoritative guide to the procedure of the Tribunal, the status of the Registry, the rights of suspects and accused, trials in absentia, and the regulation of the conduct of counsel, drawing on comparisons to other international courts. The authors include those involved in setting up the court, prosecutors, defence counsel for the suspects, as well as judges and academic commentators who are experts on the issues covered in the book. They provide a probing insight into how the Tribunal came into being, its challenges, controversies, and its achievements to date.

Atomistic Simulation of Anisotropic Crystal Structures at Nanoscale BoD – Books on Demand

Carbon nanotubes, with their extraordinary engineering properties, have garnered much attention in the past 10 years. Because of the broad range of potential applications, the scientific community is more motivated than ever to move beyond basic properties and explore the real issues associated with carbon nanotube-based applications. Presenting up-to-date literature that presents the current state of the science, this book, *Engineered Carbon Nanotubes and Nanofibrous Material: Integrating Theory and Technique*, fully explores the development phase of carbon nanotube-based applications. It looks at carbon nanotubes and their applications in diverse areas of science and engineering and considers environmental engineering applications as well. This volume is a valuable resource for engineers, scientists, researchers, and professionals in a wide range of disciplines whose focus remains on the power and promise of carbon nanotubes.

Elsevier

Tribology of Polymers, Polymer Composites, and Polymer Nanocomposites combines fundamental knowledge with the latest findings in the area of polymer tribology. From testing of property-related mechanisms to prediction of wear using artificial neural networks, the book explores all relevant polymer types, including elastomers, epoxy-based, nylon, and more while also discussing their different types of reinforcement, such as particulates, short fibers, natural fibers, and beyond. New developments in sustainable materials, environmental effects, nanoscaled fillers, and self-lubrication are each discussed, as are applications of these materials, guidelines for when to use certain polymer systems, and functional groups of polymers.

Experimental methods and modeling and prediction techniques are also outlined. The tribology of graphene-based, biodegradable, hybrid nanofiller/polymer nanocomposites and other types of polymers is discussed at length. Synthesizes the latest cutting-edge research in the tribological behaviors and applications of polymeric materials. Covers all relevant polymer types and concepts, including elastomers and natural fibers, different types of reinforcement materials, sustainable materials, interfacial modifiers and the environmental effects of self-lubrication. Outlines modeling techniques and how filler-matrix pairings and other approaches can control wear mechanisms. *Carbon Nanomaterials: Modeling, Design, and Applications* OUP Oxford

Colloids are submicron particles that are ubiquitous in both natural and industrial products. Colloids and colloidal systems play a significant role in human health as well as commercial and industrial situations. Colloids have important applications in medicine, sewage disposal, water purification, mining, photography, electroplating, agriculture, and more. This book gathers recent research from experts in the field of colloids and discusses several aspects of colloid morphology, synthesis, and applications. The book is divided into three sections that cover different techniques for the synthesis of colloids, the structure,

dynamic and stability of colloids, and applications of colloidal particles, respectively.

Electrochemistry for the Environment CRC Press

Lasers And Holography | Nano Technology & Super Conductivity | Crystallography & Modern Engineering | Ultrasonics | Fibre Optics Applications Of Optical Fibres

Modern Engineering Physics John Wiley & Sons

Design, Fabrication, and Characterization of Multifunctional Nanomaterials covers major techniques for the design, synthesis, and development of multifunctional nanomaterials. The chapters highlight the main characterization techniques, including X-ray diffraction, scanning electron microscopy, high-resolution transmission electron microscopy, energy dispersive X-ray spectroscopy, and scanning probe microscopy. The book explores major synthesis methods and functional studies, including: Brillouin spectroscopy; Temperature-dependent Raman spectroscopic studies; Magnetic, ferroelectric, and magneto-electric coupling analysis; Organ-on-a-chip methods for testing nanomaterials; Magnetron sputtering techniques; Pulsed laser deposition techniques; Positron annihilation spectroscopy to probe defects in nanomaterials; Electroanalytic techniques. This is an important reference source for materials science students, scientists, and engineers who are looking to increase their understanding of design and fabrication techniques for a range of multifunctional nanomaterials. Explains the major design and fabrication techniques and processes for a range of multifunctional nanomaterials; Demonstrates the design and development of magnetic, ferroelectric, multiferroic, and carbon nanomaterials for electronic applications, energy generation, and storage; Green synthesis techniques and the development of nanofibers and thin films are also emphasized.

A Textbook of Engineering Physics Elsevier

Swift ion beam analysis (IBA) of materials and their surfaces has been widely applied to many fields over the last half century, constantly evolving to meet new requirements and to take advantage of developments in particle detection and data treatment. Today, emerging fields in nanosciences introduce extreme demands to analysis methods at the nanoscale. This book addresses how analysis with swift ion beams is rising to meet such needs. Aimed at early stage researchers and established researchers wishing to understand how IBA can contribute to their analytical requirements in nanosciences, the basics of the interactions of charged particles with matter, as well as the operation of the relevant equipment, are first presented. Many recent examples from nanoscience research are then explored in which the specific analytical capabilities of IBA are emphasized, together with the place of IBA alongside the wealth of other analytical methods.

Optical and Molecular Physics *Optical and Molecular Physics Fundamentals and Properties of Multifunctional Nanomaterials* outlines the properties of highly intricate nanosystems, including liquid crystalline nanomaterials, magnetic nanosystems, ferroelectrics, nanomultiferroics, plasmonic nanosystems, carbon-based nanomaterials, 1D and 2D nanomaterials, and bio-nanomaterials. This book reveals the electromagnetic interference shielding properties of nanocomposites. The fundamental attributes of the nanosystems leading to the multifunctional applications in diverse areas are further explored throughout this book. This book is a valuable reference source for researchers in materials science and engineering, as well as in related disciplines, such as chemistry and physics. Explains the concepts and fundamental applications of a variety of multifunctional nanomaterials; Introduces fundamental principles in the fields of magnetism and multiferroics; Addresses ferromagnetics, multiferroics, and carbon nanomaterials.

Tribology of Polymers, Polymer Composites, and Polymer Nanocomposites S. Chand Publishing

Wastewater treatment technology is undergoing a profound transformation due to the fundamental changes in regulations governing the discharge and disposal of hazardous pollutants. Established design procedures and criteria, which have served the industry well for decades, can no longer meet the ever-increasing demand. Toxicity reduction requirements dictate in the development of new technologies for the treatment of these toxic pollutants in a safe and cost-effective manner. For most among these technologies are electrochemical processes. While electrochemical technologies have been known and utilized for the treatment of wastewater containing heavy metal cations, the application of these processes is only just a beginning to be developed for the oxidation of recalcitrant organic pollutants. In fact, only recently the electrochemical oxidation process has been recognized as an advanced oxidation process (AOP). This is due to the development of boron-doped diamond (BDD) anodes on which the oxidation of organic pollutants is mediated via the formation of active hydroxyl radicals.

Pacific Northwest Laboratory Annual Report for 1978 to the DOE Assistant Secretary for Environment CRC Press

The definitive reference on the properties and applications of polyolefin blends Polyolefins account for more than half of total plastics consumption in the world. In recent years, usage of and research on polyolefin blends have increased significantly due to new applications in medicine, packaging, and other fields and the development of novel polyolefins. With a special emphasis on nano- and micro-structures of crystals and phase morphology, Polyolefin Blends condenses and consolidates current information on polyolefins so that the reader can compare, select, and integrate a material solution. Focusing exclusively on the fundamental aspects as well as applications of polyolefin blends, this authoritative reference: * Features an introductory chapter that serves as a guide to polyolefin blends * Includes chapters covering formulation design, processing, characterization, modeling and simulation, engineering performance properties, and applications * Covers polyolefin/polyolefin blends and polyolefin/non-polyolefin blends * Discusses miscibility, phase behavior, functionalization, compatibilization, microstructure, crystallization, hierarchical morphology, and physical and mechanical properties * Covers new research trends including in-situ reactor blending and reactive processing, such as compatibilization/functionalization in the melt * Contains practical examples from open literature sources and commercial products With chapters contributed by leading experts from several countries, this is a must-have reference for scientists and engineers conducting research on polyolefin blends and for professionals in medical, packaging, and other commodity fields. It is also an excellent text for graduate students studying polymer science and polymer processing.

CRC Concise Encyclopedia of Nanotechnology CRC Press

This book "Concepts of Semiconductor Photocatalysis" contains recent research on the preparation, characterization, and potential applications of the semiconductor photocatalyst. This research is promising and has received a lot of interest in the last few decades. The book covers advanced topics on the optical, physical, structural, and electro-catalysis and photo-catalysis applications. Development of new and noble efficient technology is pointing researchers toward the safe, facile, non-toxic, eco-friendly route of synthesis-to-applications, which can be used for manufacture at a large scale. This book presents an overview of the current photocatalyst fundamental theory, substantial applications, and use of the research worldwide. It is an important book for research organizations, government research-

centers, academic libraries, and R

Green Materials and Environmental Chemistry CRC Press

Carbon Nanomaterials: Modeling, Design, and Applications provides an in-depth review and analysis of the most popular carbon nanomaterials, including fullerenes, carbon nanotubes, graphene and novel carbon nanomaterial-based membranes and thin films, with emphasis on their modeling, design and applications. This book provides basic knowledge of the structures, properties and applications of carbon-based nanomaterials. It illustrates the fundamental structure-property relationships of the materials in both experimental and modeling aspects, offers technical guidance in computational simulation of nanomaterials, and delivers an extensive view on current achievements in research and practice, while presenting new possibilities in the design and usage of carbon nanomaterials. This book is aimed at both undergraduate and graduate students, researchers, designers, professors, and professionals within the fields of materials science and engineering, mechanical engineering, applied physics, and chemical engineering.

Journal of Zhejiang University CRC Press

This volume offers a comprehensive examination of the subject of heat and mass transfer with nanofluids as well as a critical review of the past and recent research projects in this area. Emphasis is placed on the fundamentals of the transport processes using particle-fluid suspensions, such as nanofluids. The nanofluid research is examined and presented in a holistic way using a great deal of our experience with the subjects of continuum mechanics, statistical thermodynamics, and non-equilibrium thermodynamics of transport processes. Using a thorough database, the experimental, analytical, and numerical advances of recent research in nanofluids are critically examined and connected to past research with medium and fine particles as well as to functional engineering systems. Promising applications and technological issues of heat/mass transfer system design with nanofluids are also discussed. This book also: Provides a deep scientific analysis of nanofluids using classical thermodynamics and statistical thermodynamics to explain and interpret experimental observations Presents the theory and experimental results for both thermodynamic and transport properties Examines all transport properties and transport processes as well as their relationships through the pertinent macroscopic coefficients Combines recent knowledge pertaining to nanofluids with the previous fifty years of research on particulate flows, including research on transient flow and heat transfer of particulate suspensions Conducts an holistic examination of the material from more than 500 archival publications

The Special Tribunal for Lebanon BoD - Books on Demand

Renewable Materials and Green Technology Products: Environmental and Safety Aspects looks at the design, manufacture, and use of efficient, effective, safe, and more environmentally benign chemical products and processes. It includes a broad range of application-based solutions to the development of renewable materials and green technology. The latest trends in the green synthesis and properties of CNs are presented in the first chapter of this book for generating social awareness about sustainable developments. The book goes on to highlight the naissance and progressive trail of microwave-assisted synthesis of metal oxide nanoparticles, for a clean and green technology tool. Chapters discuss green technological alternatives for the global abatement of air pollution, effective use and treatment of water and wastewater, renewable power generation from solar PV cells, carbon-based nanomaterials synthesized using green protocol for sustainable development, green technologies that help to achieve economic development

without harming the environment, technical solutions to cut down the quantum of N losses, conventional processing techniques in developing the bionanocomposites as the biocatalyst, and more.

Hearings Springer

Spreading to every corner of the Earth, the COVID-19 virus has had an unparalleled impact on all aspects of our lives. This book explores in detail how the COVID-19 pandemic has affected clinical practice, education, and research in medical physics, and how colleagues on the frontline dealt with this unpredictable and unprecedented pandemic. It tackles key questions such as: How did medical physicists first respond to the situation? What innovative strategies were taken and how effective were they? How are medical physicists preparing for the future? There will be a focus on the different experiences of regional medical physicists and the responses and outlooks in clinical practice, education, and research in the affected continents, Asia-Pacific, the Middle East, Europe, Africa and North and Latin America. With over 91 contributors from 39 countries, this unique resource contains key perspectives from teams from each territory to ensure a global range of accounts. The collective opinion and wisdom from the major medical physics journal editors-in-chief are also explored, alongside how the pandemic has affected the quantity and quality of publications. Voices of early-career researchers and students of medical physics will be included, with narratives of their experiences coping with life during the pandemic. Lastly, communicating leadership in times of adversity is highlighted. This book will be a historic account of the impact of the COVID-19 virus on the field of medical physics. It will be an ideal reference for medical physicists, medical physics trainees and students, hospital administrators, regulators, and healthcare professionals allied with medical physics. Key features: The first book to cover the impact of COVID-19 on the field of medical physics Edited by two experts in the field, with chapter contributions from subject area specialists around the world Broad, global coverage, ranging from the impact on teaching, research, and publishing, with unique perspectives from journal editors and students and trainees

Grants and Awards for the Fiscal Year Ended ... S. Chand Publishing

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 diffusion Macromolecular physics Weaving together science and engineering, this new volume addresses important applications and advances in 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 macromolecular physics. This book looks at 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, magnetics, and photonics industries and offer perspectives on the manufacturing technologies used in device fabrication.

Japanese Journal of Applied Physics John Wiley & Sons

Contamination of Water: Health Risk Assessment and Treatment Strategies takes an interconnected look at various pollutants, sources of contamination, the effects of contamination on aquatic ecosystems and human health, and potential mitigation strategies. The book begins by examining the sources of potential contamination, including the current scenario of dyes, heavy metals, pesticides and oils contamination as well as regions impacted due to industrialization, mining or urbanization. It then analyzes various methods of water contamination, assesses health risk and adverse effects on those impacted, and concludes with an exploration of efficient, low-cost treatment technologies that remove toxic pollutants from the water. This book incorporates both theoretical and practical information that will be useful for researchers, professors, graduate students and professionals working on water contamination, environmental and health impacts, and the management and treatment of water resources. Provides practical case studies of various types of contamination and sources in different regions Offers an overview of inorganic and organic contaminants and their impact on human health Evaluates several low-cost, efficient and effective water treatment technologies to remove toxins from water and minimize risk

Renewable Materials and Green Technology Products S. Chand Publishing

A Textbook of Engineering Physics is written with two distinct objectives: to provide a single source of information for engineering undergraduates of different specializations and provide them a solid base in physics. Successive editions of the book incorporated topics as required by students pursuing their studies in various universities. In this new edition the contents are fine-tuned, modernized and updated at various stages.

Polymer Nanocomposite Membranes for Pervaporation CRC Press
Optical and Molecular Physics CRC Press

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