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# Acces PDF Applications Commercial Future And Present Nanotubes Carbon

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## KEY=APPLICATIONS - SINGLETON LEE

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### CHEMICALLY MODIFIED CARBON NANOTUBES FOR COMMERCIAL APPLICATIONS

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*Wiley-VCH Discover the go-to handbook for developers and application-oriented researchers who use carbon nanotubes in real products Carbon nanotubes have held much interest for researchers since their discovery in 1991. Due to their low mass density, large aspect ratio, and unique physical, chemical, and electronic properties, they provide a fertile ground for innovation in nanoscale applications. The development of chemical modifications that can enhance the poor dispersion of carbon nanotubes in solvents and improve interactions with other materials have enabled extensive industrial applications in a variety of fields. As the chemistry of carbon nanotubes and their functionalization becomes better understood, Chemically Modified Carbon Nanotubes for Commercial Applications presents the most recent developments of chemically modified carbon nanotubes and emphasizes the broad appeal for commercial purposes along many avenues of interest. The book reviews their already realized and prospective applications in fields such as electronics, photonics, separation science, food packaging, environmental monitoring and protecting, sensing technology, and biomedicine. By focusing on their commercialization prospects, this resource offers a unique approach to a significant and cutting-edge discipline. Chemically Modified Carbon Nanotubes for Commercial Applications readers will also find: Case studies that emphasize the information presented in each chapter Each chapter includes important websites and suggested reading materials Discussion of current applications of the relevant methodologies in every chapter A look at future perspectives in each application area to highlight the scope for next steps within the industry Chemically Modified Carbon Nanotubes for Commercial Applications is a valuable reference for material scientists, chemists (especially those focused on environmental concerns), and chemical and materials engineering scientists working in R&D and academia who want to learn more about chemically modified carbon nanotubes for various scalable commercial applications. It is also a useful resource for a broad audience: anyone interested in the fields of nanomaterials, nano-adsorbents, nanomedicine, bioinspired nanomaterials, nanotechnology, nanodevices, nanocomposites, biomedical application of nanomaterials, nano-engineering, and high energy applications.*

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### SINGLE-WALLED CARBON NANOTUBES

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#### PREPARATION, PROPERTIES AND APPLICATIONS

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*Springer The series Topics in Current Chemistry Collections presents critical reviews from the journal Topics in Current Chemistry organized in topical volumes. The scope of coverage is all areas of chemical science including the interfaces with related disciplines such as biology, medicine and materials science. The goal of each thematic volume is to give the non-specialist reader, whether in academia or industry, a comprehensive insight into an area where new research is emerging which is of interest to a larger scientific audience. Each review within the volume critically surveys one aspect of that topic and places it within the context of the volume as a whole. The most significant developments of the last 5 to 10 years are presented using selected examples to illustrate the principles discussed. The coverage is not intended to be an exhaustive summary of the field or include large quantities of data, but should rather be conceptual, concentrating on the methodological thinking that will allow the non-specialist reader to understand the information presented. Contributions also offer an outlook on potential future developments in the field.*

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### NANOARMORING OF ENZYMES WITH CARBON NANOTUBES AND MAGNETIC NANOPARTICLES

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*Academic Press Nanoarchitectures Built with Carbon Nanotubes and Magnetic Nanoparticles, Volume 630, the latest volume in the Methods in Enzymology series, continues the legacy of this premier serial with quality chapters authored by leaders in the field. New chapters in this volume include updates from well-known, established leaders. Contains the authority of authors who are leaders in their field Provides a comprehensive source on new methods and research in enzymology*

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### CONDUCTING POLYMERS, FUNDAMENTALS AND APPLICATIONS

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#### INCLUDING CARBON NANOTUBES AND GRAPHENE

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*Springer The second edition of this popular textbook thoroughly covers the practical basics and applications of conducting polymers. It also addresses materials that have gained prominence since the first edition of this book was published, namely carbon nanotubes and graphene. The features of this new edition include: New and updated chapters on novel concepts in conducting polymers Details on interdisciplinary applications of conducting polymers An in depth description of classes of conducting polymers*

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## **2021 INTERNATIONAL CONFERENCE ON DEVELOPMENT AND APPLICATION OF CARBON NANOMATERIALS IN ENERGETIC MATERIALS**

*Springer Nature* This book features selected papers presented at the 2021 International Conference on Development and Application of Carbon Nanomaterials in Energetic Materials. It discusses the latest progress in the field of advanced carbon nanomaterials in energetic materials; including the structural design, theoretical calculation, synthesis, properties, and applications of carbon materials. It also presents the new technology and applications of advanced carbon nanomaterials in energetic materials. It can be used as a reference book for researchers in energetic materials and related fields. It is also useful for undergraduates and postgraduates studying these topics.

## **RESEARCH ANTHOLOGY ON RELIABILITY AND SAFETY IN AVIATION SYSTEMS, SPACECRAFT, AND AIR TRANSPORT**

*IGI Global* As with other transportation methods, safety issues in aircraft can result in a total loss of life. Recently, the air transport industry has come under immense scrutiny after several deaths occurred due to aircraft design and airlines that allowed improperly inspected aircraft to fly. Spacecraft too have found errors in system software that could lead to catastrophic failure. It is imperative that the aviation and aerospace industries continue to revise and refine safety protocols from the construction and design of aircraft, to secure and improve aviation systems, and to test and inspect aircraft. The Research Anthology on Reliability and Safety in Aviation Systems, Spacecraft, and Air Transport is a vital reference source that examines the latest scholarly material on the use of adaptive and assistive technologies in aviation to establish clear guidelines for the design and implementation of such technologies to better serve the needs of both military and civilian pilots. It also covers new information technology use in aviation systems to streamline the cybersecurity, decision making, planning, and design processes within the aviation industry. Highlighting a range of topics such as air navigation systems, computer simulation, and airline operations, this multi-volume book is ideally designed for pilots, scientists, engineers, aviation operators, air traffic controllers, air crash investigators, teachers, academicians, researchers, and students.

## **FIBROUS AND TEXTILE MATERIALS FOR COMPOSITE APPLICATIONS**

*Springer* This book focuses on the fibers and textiles used in composite materials. It presents both existing technologies currently used in commercial applications and the latest advanced research and developments. It also discusses the different fiber forms and architectures, such as short fibers, unidirectional tows, directionally oriented structures or advanced 2D- and 3D-textile structures that are used in composite materials. In addition, it examines various synthetic, natural and metallic fibers that are used to reinforce polymeric, cementitious and metallic matrices, as well as fiber properties, special functionalities, manufacturing processes, and composite processing and properties. Two entire chapters are dedicated to advanced nanofiber and nanotube reinforced composite materials. The book goes on to highlight different surface treatments and finishes that are applied to improve fiber/matrix interfaces and other essential composite properties. Although a great deal of information about fibers and textile structures used for composite applications is already available, this is the only book currently available that discusses all types of fibers and structures used to reinforce polymers, cement, metal or soil to improve their general performance and multi-functional behaviors. As such, it fills an important gap in the available literature and provides a valuable resource for a wide range of students and researchers from academia and industry.

## **CURRENT AND FUTURE DEVELOPMENTS IN NANOMATERIALS AND CARBON NANOTUBES**

*Bentham Science Publishers* Current and Future Developments in Nanomaterials and Carbon Nanotubes presents thematic volumes that highlight research in the field of nanomaterials. The book series covers the theory and application of nanomaterials including carbon nanotubes, composites, metallic nanomaterials and much more. It is essential reading to researchers interested in keeping up to date with nanomaterial applications in a wide variety of fields such as medicine, engineering and biotechnology.

## **2D MONOELEMENTS**

### **PROPERTIES AND APPLICATIONS**

*John Wiley & Sons* 2D Monoelements: Properties and Applications explores the challenges, research progress and future developments of the basic idea of two-dimensional monoelements, classifications, and application in field-effect transistors for sensing and biosensing. The thematic topics include investigations such as: Recent advances in phosphorene The diverse properties of two-dimensional antimonene, of graphene and its derivatives The molecular docking simulation study used to analyze the binding mechanisms of graphene oxide as a cancer drug carrier Metal-organic frameworks (MOFs)-derived carbon (graphene and carbon nanotubes) and MOF-carbon composite materials, with a special emphasis on the use of these nanostructures for energy storage devices (supercapacitors) Two-dimensional monoelements classification like graphene application in field-effect transistors for sensing and biosensing Graphene-based ternary materials as a supercapacitor electrode Rise of silicene and its applications in gas sensing

## **ICE TEMPLATING AND FREEZE-DRYING FOR POROUS MATERIALS AND THEIR APPLICATIONS**

*John Wiley & Sons* Filling a gap in the literature, this is the first book to focus on the fabrication of functional porous materials by using ice templating and freeze drying. Comprehensive in its scope, the volume covers such techniques as the fabrication of porous polymers, porous ceramics, biomimetic strong composites, carbon nanostructured materials, nanomedicine, porous nanostructures by freeze drying of colloidal or nanoparticle suspensions, and porous materials by combining ice templating and other techniques. In addition, applications for each type of material are also discussed. Of great benefit to those working in the freeze-drying field and researchers in porous materials, materials chemistry, engineering, and the use of such materials for various applications, both in academia and industry.

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**NANOSCIENCE FOR SUSTAINABLE AGRICULTURE**

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*Springer Nature* 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.

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**CARBON NANOTUBE SCIENCE**

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**SYNTHESIS, PROPERTIES AND APPLICATIONS**

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*Cambridge University Press* Provides coverage of all of the important aspects of carbon nanotube research, including synthesis, properties and potential applications.

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**COMPOSITES MATERIALS FOR FOOD PACKAGING**

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*John Wiley & Sons* The novel insights, as well as the main drawbacks of each engineered composites material is extensively evaluated taking into account the strong relationship between packaging materials, environmental and reusability concerns, food quality, and nutritional value. Composites, by matching the properties of different components, allow the development of innovative and performing strategies for intelligent food packaging, thus overcoming the limitations of using only a single material. The book starts with the description of montmorillonite and halloysite composites, subsequently moving to metal-based materials with special emphasis on silver, zinc, silicon and iron. After the discussion about how the biological influences of such materials can affect the performance of packaging, the investigation of superior properties of sp<sup>2</sup> carbon nanostructures is reported. Here, carbon nanotubes and graphene are described as starting points for the preparation of highly engineered composites able to promote the enhancement of shelf-life by virtue of their mechanical and electrical features. Finally, in the effort to find innovative composites, the applicability of biodegradable materials from both natural (e.g. cellulose) and synthetic (e.g. polylactic acid - PLA) origins, with the aim to prove that polymer-based materials can overcome some key limitations such as environmental impact and waste disposal.

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**ENCYCLOPEDIA OF INFORMATION SCIENCE AND TECHNOLOGY, FOURTH EDITION**

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*IGI Global* In recent years, our world has experienced a profound shift and progression in available computing and knowledge sharing innovations. These emerging advancements have developed at a rapid pace, disseminating into and affecting numerous aspects of contemporary society. This has created a pivotal need for an innovative compendium encompassing the latest trends, concepts, and issues surrounding this relevant discipline area. During the past 15 years, the Encyclopedia of Information Science and Technology has become recognized as one of the landmark sources of the latest knowledge and discoveries in this discipline. The Encyclopedia of Information Science and Technology, Fourth Edition is a 10-volume set which includes 705 original and previously unpublished research articles covering a full range of perspectives, applications, and techniques contributed by thousands of experts and researchers from around the globe. This authoritative encyclopedia is an all-encompassing, well-established reference source that is ideally designed to disseminate the most forward-thinking and diverse research findings. With critical perspectives on the impact of information science management and new technologies in modern settings, including but not limited to computer science, education, healthcare, government, engineering, business, and natural and physical sciences, it is a pivotal and relevant source of knowledge that will benefit every professional within the field of information science and technology and is an invaluable addition to every academic and corporate library.

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**COUNTER ELECTRODES FOR DYE-SENSITIZED AND PEROVSKITE SOLAR CELLS (2 VOLS.)**

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*John Wiley & Sons* A guide to one of the most important aspects for affordable and highly efficient dye-sensitized solar cells Dye-sensitized solar cells have the potential to be one of the most promising photovoltaic technologies for production of renewable and clean energy. Counter Electrodes for Dye-Sensitized and Perovskite Solar Cells offers an introduction to the various types of counter electrode catalysts for dye-sensitized solar cells and perovskite solar cells, including metal and metal compounds, carbon materials, polymers, and composites. With contributions from an international panel of experts, the book contains a discussion of the design and synthesis of the catalysts, characterization and stability of the devices, as well as calculations on properties. The contributors cover a wide range of topics including information on: carbon nanotubes electrocatalysts for I-mediated dye-sensitized solar cells; Pt-loaded composite electrocatalysts for I-mediated dye-sensitized solar cells; metal contact electrodes for perovskite solar cells; and much more. The book also includes insight into the future developments in the field. This important resource Covers the various types of counter electrode catalysts and presents design strategies, synthesis methods, theoretical calculation and stability evaluation Includes information on low-cost counter electrode catalysts and commercial applications of dye-sensitized solar cells Discusses how electrode catalysts can be applied in a range of fields, such as solar cells, fuel cells, hydrogen production, and photocatalysis Offers contributions from leading experts in the field including Anders Hagfeldt, one of the world's leading researchers in this field Written for materials scientists, solid state chemists, electrochemists, catalytic chemists, solid state physicists, and chemical industry professionals, Counter Electrodes for Dye-Sensitized and Perovskite Solar Cells is a comprehensive and authoritative guide to dye-sensitized solar cells.

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**SYNTHESIS AND APPLICATIONS OF NANOCARBONS**

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*John Wiley & Sons* A crucial overview of the cutting-edge in nanocarbon research and applications In Synthesis and Applications of Nanocarbons, the distinguished authors have set out to discuss fundamental topics, synthetic approaches, materials challenges, and

various applications of this rapidly developing technology. Nanocarbons have recently emerged as a promising material for chemical, energy, environmental, and medical applications because of their unique chemical properties and their rich surface chemistries. This book is the latest entry in the Wiley book series *Nanocarbon Chemistry and Interfaces* and seeks to comprehensively address many of the newly surfacing areas of controversy and development in the field. This book introduces foundational concepts in nanocarbon technology, hybrids, and applications, while also covering the most recent and cutting-edge developments in this area of study. *Synthesis and Applications of Nanocarbons* addresses new discoveries in the field, including: · Nanodiamonds · Onion-like carbons · Carbon nanotubes · Fullerenes · Carbon dots · Carbon fibers · Graphene · Aerographite This book provides a transversal view of the various nanocarbon materials and hybrids and helps to share knowledge between the communities of each material and hybrid type.

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## **NANOTECHNOLOGY IN AEROSPACE AND STRUCTURAL MECHANICS**

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*IGI Global* The realms of aerospace and structural mechanics have been revolutionized due to a plethora of technological advances. These two important sectors most notably have been impacted by the advancement of nanotechnology and have introduced potential groundbreaking changes for lightweight, high strength, and improved electronic properties of nanomaterials. *Nanotechnology in Aerospace and Structural Mechanics* aims to provide a collection of innovative research on the latest development of materials and methods for designing smart and intelligent devices for use in the field of space research and structural mechanics. It provides a thorough study of the fabrication and control of mechanical systems required for the successful application of nanotechnology in aerospace and structural engineering. While highlighting topics including nanomaterial properties, aerospace electronics, and polymer nanocomposites, this book is ideally designed for engineers, researchers, students, and academicians with interests in the fields of civil engineering, mechanical engineering, aerospace engineering, and nanoscience.

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## **TAILORED FUNCTIONAL MATERIALS**

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### **SELECT PROCEEDINGS OF MMETFP 2021**

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*Springer Nature* This book presents the select proceedings of the International Symposium entitled "Materials of the Millennium: Emerging Trends and Future Prospects" (MMETFP 2021). It discusses the synthesis, tailoring, and characterization of different materials for functional applications in various sectors which include but not limited to energy, environment, biomedical/ health care, construction, transportation etc. Topics covered in this book are synthesis and characterization of polymers, ceramics, composites, biomaterials, carbon-based nanostructures as well as materials for green environment, structural materials, modeling and simulation of materials. The book also covers the topic of emerging trends in nanostructured materials, thin films, and devices. The book is useful for students, researchers, and professionals working in the various areas of materials science and engineering.

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## **GRAPHENE AND NANOPARTICLES HYBRID NANOCOMPOSITES**

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### **FROM PREPARATION TO APPLICATIONS**

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*Springer Nature* This book covers the recent research on nanomaterials and nanotechnology based on the hybridization of graphene with other nanoparticles. With their simple synthesis, nanoscale dimensions, high aspect ratio, mechanical, electrical and thermal properties, graphene and its hybridized materials have witnessed a great interest, and the chapters in this book cover the spectrum of research from the preparation and synthesis of novel nanocomposites to their potential use in aeronautic, automotive, energy and environmental applications. Written by respected researchers from both industry and academia, this book is of interest to researchers and students working on nanomaterials.

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## **FUNCTIONALIZED NANOMATERIALS FOR CATALYTIC APPLICATION**

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*John Wiley & Sons* With the rapid development in nanotechnology, it is now possible to modulate the physical and chemical properties of nanomaterials with molecular recognition and catalytic functional applications. Such research efforts have resulted in a huge number of catalytic platforms for a broad range of analytes ranging from metal ions, small molecules, ionic liquid and nucleic acids down to proteins. Functionalized nanomaterials (FNMs) have important applications in the environmental, energy and healthcare sectors. Strategies for the synthesis of FNMs have contributed immensely to the textile, construction, cosmetics, biomedical and environmental industries among others. This book highlights the design of functionalized nanomaterials with respect to recent progress in the industrial arena and their respective applications. It presents an inclusive overview encapsulating FNMs and their applications to give the reader a systematic and coherent picture of nearly all relevant up-to-date advancements. Herein, functionalization techniques and processes are presented to enhance nanomaterials that can substantially affect the performance of procedures already in use and can deliver exciting consumer products to match the current lifestyle of modern society.

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## **ORGANIC POLLUTANTS IN WASTEWATER II**

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### **METHODS OF ANALYSIS, REMOVAL AND TREATMENT**

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*Materials Research Forum LLC* Wastewater represents an alternative to freshwater if it can be treated successfully for re-use applications. Promising techniques involve photocatalysis, photodegradation, adsorption, bioreactors, nanocomposites, nanofiltration and membranes. Keywords: Wastewater Treatment, Biohydrogen Production, Bioethanol Production, Biological Wastewater, Carbon Nanotubes, Dairy Wastewater, Graphene-based Nanocomposites, Hormones in Wastewater, Malachite Green Removal, Membrane Bioreactors, Nanocomposites, Nanofiltration, Nanomembranes, Nanotubes, Organic Pollutants, Pesticides Removal, Photocatalysis, Photodegradation, Reversed Osmosis, Textile Wastewater.

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## **ECONOMIC GROWTH AND BREAKTHROUGH INNOVATIONS: A CASE STUDY OF NANOTECHNOLOGY**

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*WIPO* This paper examines the role of intellectual property and other innovation incentives in the development of one field of breakthrough innovation: nanotechnology. Because nanotechnology is an enabling technology across a wide range of fields, the nanotechnology innovation ecosystem appears to be a microcosm of the global innovation ecosystem. Part I describes the nature of nanotechnology and its economic contribution, Part II explores the nanotechnology innovation ecosystem, and Part III focuses on the role of IP systems in the development of nanotechnology.

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## **NANOTECHNOLOGY, FOOD SECURITY AND WATER TREATMENT**

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*Springer* This book reviews advanced nanotechnology in food, health, water and agriculture. In food, nanobiosensors display an unprecedented efficiency for the detection of allergens, genetically modified organisms and pathogens. In agriculture, nanofertilisers improve plant nutrition by releasing nutrients slowly and steadily. Nanomaterials synthesised using biomass such as fungi are further found remarkable to clean waters polluted by heavy metals. However, as newly introduced materials in the environment, nanoparticles may exhibit toxic effects, which are reviewed in this book. In the context of climate change, methods for water desalination are also presented.

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## **PHYTOTOXICITY OF NANOPARTICLES**

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*Springer* This book provides relevant findings on nanoparticles' toxicity, their uptake, translocation and mechanisms of interaction with plants at cellular and sub-cellular level. The small size and large specific surface area of nanoparticles endow them with high chemical reactivity and intrinsic toxicity. Such unique physicochemical properties draw global attention of scientists to study potential risks and adverse effects of nanoparticles in the environment. Their toxicity has pronounced effects and consequences for plants and ultimately the whole ecosystem. Plants growing in nanomaterials-polluted sites may exhibit altered metabolism, growth reduction, and lower biomass production. Nanoparticles can adhere to plant roots and exert physicochemical toxicity and subsequently cell death in plants. On the other hand, plants have developed various defense mechanisms against this induced toxicity. This book discusses recent findings as well as several unresolved issues and challenges regarding the interaction and biological effects of nanoparticles. Only detailed studies of these processes and mechanisms will allow researchers to understand the complex plant-nanomaterial interactions.

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## **APPLYING NANOTECHNOLOGY TO THE DESULFURIZATION PROCESS IN PETROLEUM ENGINEERING**

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*IGI Global* As regulations push the fossil fuel industry toward increasing standards of eco-friendliness and environmental sustainability, desulfurization (the removal of SO<sub>2</sub> from industrial waste byproducts) presents a new and unique challenge that current technology is not equipped to address. Advances in nanotechnology offer exciting new opportunities poised to revolutionize desulfurization processes. *Applying Nanotechnology to the Desulfurization Process in Petroleum Engineering* explores recent developments in the field, including the use of nanomaterials for biodesulfurization and hydrodesulfurization. The timely research presented in this volume targets an audience of engineers, researchers, educators as well as students at the undergraduate and post-graduate levels.

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## **MEMBRANES FOR ENVIRONMENTAL APPLICATIONS**

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*Springer Nature* This book introduces recent developments of membrane technologies applied to gas and water treatments, energy processes and environmental issues. Novel knowledge and mechanisms on membrane fabrication and usage in energy, chemical, and environmental engineering are detailed in 12 book chapters from France, UK, Spain, China, Nigeria, Iran and Pakistan. The information in this book will be useful for engineers, students, and experts in these fields.

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## **ADVANCED METHODOLOGIES AND TECHNOLOGIES IN DIGITAL MARKETING AND ENTREPRENEURSHIP**

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*IGI Global* As businesses aim to compete internationally, they must be apprised of new methods and technologies to improve their digital marketing strategy in order to remain ahead of their competition. Trends in entrepreneurship that drive consumer engagement and business initiatives, such as social media marketing, yields customer retention and positive feedback. *Advanced Methodologies and Technologies in Digital Marketing and Entrepreneurship* provides information on emerging trends in business innovation, entrepreneurship, and marketing strategies. While highlighting challenges such as successful social media interactions and consumer engagement, this book explores valuable information within various business environments and industries such as e-commerce, small and medium enterprises, hospitality and tourism management, and customer relationship management. This book is an ideal source for students, marketers, social media marketers, business managers, public relations professionals, promotional coordinators, economists, hospitality industry professionals, entrepreneurs, and researchers looking for relevant information on new methods in digital marketing and entrepreneurship.

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## **NANOMECHANICS**

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*BoD - Books on Demand* In recent years, nanotechnology is the basis for the development of modern production. This determined the urgency of the intensive development of the new direction of mechanics and nanomechanics, for the scientific description of nanotechnological processes and the solution of several topical nanotechnology problems. Topics included in the book cover a wide range of research in the field of nanomechanics: thermomass theory of nanosystems; deformation of nanomaterials; interface mechanics of assembly carbon nanotube; nanomechanics on surface; molecular interactions and transformations; nanomechanical sensors, nanobeams, and micromembranes; nanostructural organic and inorganic materials; green synthesis of metallic nanoparticles. The main goal of these works is the establishment of the nanosystem macroparameter dependence on its nanoparameters using nanomechanics. This book will be useful for engineers, technologists, and researchers interested in methods of nanomechanics and in advanced nanomaterials with complex behavior and their applications.

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## **PROCESSING AND CHARACTERIZATION OF MATERIALS**

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### **SELECT PROCEEDINGS OF CPCM 2020**

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*Springer Nature* This book includes selected conference proceedings of Conference on Processing and Characterization of Materials (CPCM-2020). The content of the book includes processing of and characterization of materials, sustainable energy materials, defense materials, functionally graded materials, and composites which has significant impact on cutting-edge applications. The book also includes surface engineering, computational methods and materials, waste utilization, and corrosion and environmental degradation of materials. Design, research, and development studies, experimental investigations, theoretical analysis, and fabrication techniques relevant to the application of materials in various assemblies, ranging from individual components to complete structure are presented in the book. The book is useful for graduate students, researchers, and industry professionals alike.

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### **PHOTOCATALYSIS**

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#### **ADVANCED MATERIALS AND REACTION ENGINEERING**

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*Materials Research Forum LLC* Photocatalysis is important in fighting environmental pollution, such as pharmaceutical effluents, dyes, pesticides and endocrine disruptors. It is also used for the production of clean energy, e.g. by way of hydrogen production from watersplitting, or CO<sub>2</sub> conversion into fuels. Further, photocatalytic N<sub>2</sub> fixation is promising for achieving sustainable ammonia synthesis. The book discusses new materials and reaction engineering techniques, such as heterojunction formations, composites, ion exchangers, photocatalytic membranes, etc. Keywords: Photocatalysis, Pollutant Degradation and Mineralization, Pharmaceutical Effluents, Dyes, Pesticides, Endocrine Disruptors, Water Detoxification, Photocatalytic Hydrogen Production, CO<sub>2</sub> Conversion into Fuels, N<sub>2</sub> Fixation, Degradation of Organic Molecules, Heavy Metal Removal from Water, Photocatalytic Membranes, Carbon Nitride for Photocatalytic Applications, Carbon Nanotubes, Nanohybrids, Composite Ion Exchangers, Perovskites-based Nano Heterojunctions.

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### **SMART ELECTRONIC SYSTEMS**

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#### **HETEROGENEOUS INTEGRATION OF SILICON AND PRINTED ELECTRONICS**

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*John Wiley & Sons* Unique in focusing on both organic and inorganic materials from a system point of view, this text offers a complete overview of printed electronics integrated with classical silicon electronics. Following an introduction to the topic, the book discusses the materials and processes required for printed electronics, covering conducting, semiconducting and insulating materials, as well as various substrates, such as paper and plastics. Subsequent chapters describe the various building blocks for printed electronics, while the final part describes the resulting novel applications and technologies, including wearable electronics, RFID tags and flexible circuit boards. Suitable for a broad target group, both industrial and academic, ranging from mechanical engineers to ink developers, and from chemists to engineers.

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### **TMS 2016 145TH ANNUAL MEETING & EXHIBITION, ANNUAL MEETING SUPPLEMENTAL PROCEEDINGS**

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*Springer*

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### **ADVANCES IN MACHINING OF COMPOSITE MATERIALS**

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#### **CONVENTIONAL AND NON-CONVENTIONAL PROCESSES**

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*Springer Nature* This book covers a wide range of conventional and non-conventional machining processes of various composite materials, including polymer and metallic-based composites, nanostructured composites and green/natural composites. It presents state-of-the-art academic work and industrial developments in material fabrication, machining, modelling and applications, together with current practices and requirements for producing high-quality composite components. There are also dedicated chapters on physical properties and fabrication techniques of different composite material groups. The book also has chapters on health and safety considerations when machining composite materials and recycling composite materials. The contributors present machining composite materials in terms of operating conditions; cutting tools; appropriate machines; and typical damage patterns following machining operations. This book serves as a useful reference for manufacturing engineers, production supervisors, tooling engineers, planning and application engineers, and machine tool designers. It can also benefit final-year undergraduate and postgraduate students, as it provides comprehensive information on the machining of composite materials to produce high-quality final components. The book chapters were authored by experienced academics and researchers from four continents and nine countries including Canada, China, Egypt, India, Malaysia, Portugal, Singapore, United Kingdom and the USA.

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### **ADVANCED NANOTECHNOLOGIES FOR DETECTION AND DEFENCE AGAINST CBRN AGENTS**

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*Springer* This volume gives a broad overview of advanced technologies for detection and defence against chemical, biological, radiological and nuclear (CBRN) agents. It provides chapters addressing the preparation and characterization of different nanoscale materials (metals, oxides, glasses, polymers, carbon-based, etc.) and their applications in fields related to security and safety. In addition, it presents an interdisciplinary approach as the contributors come from different areas of research, such as physics, chemistry, engineering, materials science and biology. A major feature of the book is the combination of longer chapters introducing the basic knowledge on a certain topic, and shorter contributions highlighting specific applications in different security areas.

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### **NANOTOXICOLOGY**

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## EXPERIMENTAL AND COMPUTATIONAL PERSPECTIVES

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Royal Society of Chemistry

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## NANOMATERIALS, POLYMERS AND DEVICES

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### MATERIALS FUNCTIONALIZATION AND DEVICE FABRICATION

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*John Wiley & Sons* This book provides comprehensive coverage of shape-memory polymers (SMPs), a growing area within "smart materials" research. After offering an introduction to the topic and the nature of shape-memory effects and superelasticity, the author offers an in-depth look at the properties, mechanics, and characterization of SMPs and thermoplastic elastomers. Information on the wide range of applications for these materials follows, including: bioplastics and biomedical devices; textiles and fabrics; optical, electronic, and mechanical parts for control systems; cosmetics and beauty products; automotive (or other novel) materials.

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## NANOTECHNOLOGY FOR AGRICULTURE

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### ADVANCES FOR SUSTAINABLE AGRICULTURE

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*Springer Nature* 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.

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## NANOSCIENCES AND NANOTECHNOLOGY

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### EVOLUTION OR REVOLUTION?

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*Springer* This book provides information to the state of art of research in nanotechnology and nano medicine and risks of nano technology. It covers an interdisciplinary and very wide scope of the latest fundamental research status and industrial applications of nano technologies ranging from nano physics, nano chemistry to biotechnology and toxicology. It provides information to last legislation of nano usage and potential social impact too. The book contains also a reference list of major European research centers and associated universities offering licences and master of nano matter. For clarity and attractivity, the book has many illustrations and specific inserts to complete the understanding of the scientific texts.

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## ADVANCED ELECTRODE MATERIALS

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*John Wiley & Sons* This book covers the recent advances in electrode materials and their novel applications at the cross-section of advanced materials. The book is divided into two sections: State-of-the-art electrode materials; and engineering of applied electrode materials. The chapters deal with electrocatalysis for energy conversion in view of bionanotechnology; surfactant-free materials and polyoxometalates through the concepts of biosensors to renewable energy applications; mesoporous carbon, diamond, conducting polymers and tungsten oxide/conducting polymer-based electrodes and hybrid systems. Numerous approaches are reviewed for lithium batteries, fuel cells, the design and construction of anode for microbial fuel cells including phosphate polyanion electrodes, electrocatalytic materials, fuel cell reactions, conducting polymer based hybrid nanocomposites and advanced nanomaterials.

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## ADVANCED MANUFACTURING METHODS

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### SMART PROCESSES AND MODELING FOR OPTIMIZATION

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*CRC Press* Advanced Manufacturing Methods: Smart Processes and Modeling for Optimization describes developments in advanced manufacturing processes and applications considering typical and advanced materials. It helps readers implement manufacturing 4.0 production techniques and highlights why a consolidated source and robust platform are necessary for implementing machine learning processes in the manufacturing sector. Discusses the industrial impact of manufacturing process Provides novel fundamental manufacturing solutions Presents the various aspects of applications in advanced materials in correlation of physical properties with macro-, micro- and nanostructures Reviews both classical and artificial manufacturing when applied with typical and novel innovative materials Aimed at those working in manufacturing, mechanical and optimization of manufacturing processes, this work provides readers with a comprehensive view of current development in, and applications of, advanced manufacturing.