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KEY=ADVANCED - EATON STERLING

UNDERSTANDING ADVANCED ORGANIC AND ANALYTICAL CHEMISTRY: THE LEARNER'S APPROACH (REVISED EDITION)

World Scientific Publishing Company **This revised edition has been updated to meet the minimum requirements of the new Singapore GCE A level syllabus that would be implemented in the year 2016. Nevertheless, this book is also highly relevant to students who are studying chemistry for other examination boards. In addition, the authors have also included more Q&A to help students better understand and appreciate the chemical concepts that they are mastering.**

ADVANCED SOLID CATALYSTS FOR RENEWABLE ENERGY PRODUCTION

IGI Global **In recent years, the replacement of non-renewable crude oil by renewable sources has been addressed, particularly in developed countries. Its main driving force has been the increasing demand and limited reserves of fossil fuels, the greenhouse gas effect, and the need of securing energy supplies. Advanced Solid Catalysts for Renewable Energy Production provides emerging research on renewable energy production, catalysts, and environmental effects of increased productivity. While highlighting the challenges for future generations to develop in the sustainable energy age, readers will learn the importance of new approaches not only for synthesizing more active and selective (nano)catalysts, but also, for designing innovative catalytic processes that can eventually meet the growing energy efficiency demand and overcome the environmental issues. This book is an important resource for academicians, university researchers, technology developers, and graduate level students.**

SELENIUM CONTAMINATION IN WATER

John Wiley & Sons **The contamination of environment and water resources by Selenium (Se) and its oxyanions from various sources are emerging contaminants of significant health and environmental concern. The primary sources include agricultural drainage water, mine drainage, residues from fossil fuels, thermoelectric power plants, oil refineries, and metal ores. Various methods and technologies have been developed which focus on the treatment of selenium-containing waters and wastewater. High concentrations of selenium in water cause various adverse impact to human health, such as carcinogenic, genotoxic, and cytotoxic effects. But in the lower concentrations, it is a useful constituent of the biological system. The range between toxicity and deficiency of selenium is minimal (40 to 400 µg per day), due to its dual nature. Selenium Contamination in Water contains the latest status and information on selenium's origin, its chemistry and its toxicity to humans. The book represents a comprehensive and advanced reference book for students, researchers, practitioners, and policymakers in working in the field of metalloids, in particular selenium. A special emphasis is given on its geological distribution, monitoring techniques, and remedial technologies. As such, the authors critically analyze the various techniques used for the monitoring and removal of selenium from water. Featuring chapters arranged according to the major themes of the latest research, with specific case-studies from industrial experiences of selenium detection and removal, Selenium Contamination in Water will be particularly valued by researchers, practitioners, and policymakers in working in the field of metalloids including selenium.**

ATOMIC FORCE MICROSCOPY FOR ENERGY RESEARCH

CRC Press **Atomic force microscopy (AFM) can be used to analyze and measure the physical properties of all kinds of materials at nanoscale in the atmosphere, liquid phase, and ultra-high vacuum environment. It has become an important tool for nanoscience research. In this book, the basic principles of functional AFM techniques and their applications in energy materials—such as lithium-ion batteries, solar cells, and other energy-related materials—are addressed. FEATURES First book to focus on application of AFM for energy**

research Details the use of advanced AFM and addresses many types of functional AFM tools Enables readers to operate an AFM instrument successfully and to understand the data obtained Covers new achievements in AFM instruments, including electrochemical strain microscopy, and how AFM is being combined with other new methods such as infrared (IR) spectroscopy With its substantial content and logical structure, Atomic Force Microscopy for Energy Research is a valuable reference for researchers in materials science, chemistry, and physics who are working with AFM or planning to use it in their own fields of research, especially energy research.

SCIENCE, TECHNOLOGY AND ADVANCED APPLICATION OF SUPERCAPACITORS

BoD – Books on Demand **Application fields of supercapacitors are expanding because they have a very large charge/discharge current density and a cycle durability of tens of thousands of cycles or more compared to secondary batteries. There are various kinds of supercapacitor: electric double layer capacitors with a relatively long history, pseudocapacitors that utilize electrochemical reactions, and the progress of hybrid capacitor technology that combines double layer capacity and electrochemical reactions. Development of electrode materials and electrolytes and new cell design for constructing devices support the performance improvement and expansion of new applied fields such as automobiles, heavy machinery, and energy harvesting. This book aims to provide engineers with the opportunity to review the latest information by integrating cutting-edge papers on science, technology, and the application of supercapacitors.**

BORON PROXIES IN PALEOCEANOGRAPHY AND PALEOCLIMATOLOGY

Wiley-Blackwell **Anthropogenic carbon dioxide emissions do not only warm our planet but also acidify our oceans. It is currently unclear to which degree Earth's climate and marine life will be impacted by these changes but information from Earth history, particularly the geochemical signals of past environmental changes stored in the fossil remains of marine organisms, can help us predict possible future changes. This book aims to be a primer for scientists who seek to apply boron proxies in marine carbonates to estimate past seawater carbonate chemistry and atmospheric pCO2. Boron proxies (δ11B and B/Ca) were introduced nearly three decades ago, with subsequent strides being made in understanding their mechanistic functioning. This text reviews current knowledge about the aqueous systematics, the inorganic and biological controls on boron isotope fractionation and incorporation into marine carbonates, as well as the analytical techniques for measurement of boron proxies. Laboratory and field calibrations of the boron proxies are summarized, and similarities between modern calibrations are explored to suggest estimates for proxy sensitivities in marine calcifiers that are now extinct. Example applications illustrate the potential for reconstructing paleo-atmospheric pCO2 from boron isotopes. Also explored are the sensitivity of paleo-ocean acidity and pCO2 reconstructions to boron isotope proxy systematics that are currently less well understood, including the elemental and boron isotopic composition of seawater through time, seawater alkalinity, temperature and salinity, and their collective impact on the uncertainty of paleo-reconstructions. The B/Ca proxy is based on the same mechanistic principles as the boron isotope proxy, but empirical calibrations suggest seawater pH is not the only controlling factor. B/Ca therefore has the potential to provide a second carbonate parameter that could be paired with δ11B to fully constrain the ocean carbonate system, but the associated uncertainties are large. This text reviews and examines what is currently known about the B/Ca proxy systematics. As more scientists embark on characterizing past ocean acidity and atmospheric pCO2, Boron in Paleoceanography and Paleoclimatology provides a resource to introduce geoscientists to the opportunities and complications of boron proxies, including potential avenues to further refine them.**

CARBON DOTS IN ANALYTICAL CHEMISTRY

DETECTION AND IMAGING

Elsevier **Carbon Dots in Analytical Chemistry: Detection and Imaging explores recent progress in the field of carbon dots synthesis and properties and their integration with various miniaturized analytical devices for the detection of chemical species and imaging of cells. This book is dedicated to exploring the potential applications of carbon dots in analytical chemistry for clinical microbiology, pharmaceutical analysis and environmental analysis. Sections cover synthetic approaches and properties, sample preparation, analytical techniques for the detection of chemical species, imaging of molecules and cells, and analytical tools for biomedical and food analysis. The will be a valuable book for analytical and materials scientists, physical and chemical scientists, and engineers investigating the use of carbon nanomaterials in their analytical procedures. Provides basic knowledge on the preparation and properties of carbon dots and their uses to remove toxic chemical species Integrates knowledge from the fabrication, mechanics, materials science and reliability points-of-view Covers carbon-dot-based optical methods for assaying trace-level target analytes**

CELL ASSEMBLY WITH 3D BIOPRINTING

John Wiley & Sons **This book covers comprehensive information of 3D bioprinting from methods to design of bioink, to biofabrication approaches and their applications.**

BIOSENSORS AND NANOTECHNOLOGY

APPLICATIONS IN HEALTH CARE DIAGNOSTICS

John Wiley & Sons **General introduction to biosensors and recognition receptors -- Biomarkers in health care -- The use of nanomaterials and microfluidics in medical diagnostics -- SPR-based biosensor technologies in disease detection and diagnostics -- Piezoelectric-based biosensor technologies in disease detection and diagnostics -- Electrochemical-based biosensor technologies in disease detection and diagnostics -- MEMS-based cell counting methods -- Lab-on-a-chip platforms for disease detection and diagnosis -- Applications of quantum dots in biosensors and diagnostics -- Applications of molecularly imprinted nanostructures in biosensors and diagnostics -- Smart nanomaterial's : applications in biosensors and diagnostics -- Applications of magnetic nanomaterial's in biosensors and diagnostics -- Graphene applications in biosensors and diagnostics -- Optical biosensors and applications to drug discovery for cancer cases -- Biosensors for detection of anticancer drug-DNA interactions**

ADVANCED NANOMATERIALS FOR INEXPENSIVE GAS MICROSENSORS

SYNTHESIS, INTEGRATION AND APPLICATIONS

Elsevier **Advanced Nanomaterials for Inexpensive Gas Microsensors presents full coverage of the area of gas sensing nanomaterials, from materials, transducers and applications to the latest advanced results and future directions. A number of experts in the field present work on gas sensing nanomaterials including metal oxides, carbon based and hybrid materials, together with their fabrication and application. The book brings together three major themes: Several chapters address synthesis, functionalization, characterization of advanced nanomaterials, with emphasis on synthesis techniques to ease the integration of nanomaterials in transducers. These chapters encompass a wide spectrum of sensing technologies including advanced nanomaterials such as metal oxides, carbon materials and graphene, organic molecular materials, and atomic layers such as MoS2. The authors examine the coupling of sensitive nanomaterials to different types of transducer elements and their applications, including direct growth and additive fabrication techniques as a way to obtain inexpensive gas microsensors, principal transduction schemes, and advanced operating methods. Assess the value of major applications for gas microsensors, including air quality monitoring both indoors (buildings and vehicles) and outdoors, monitoring perishable goods and medical. For each application, potential issues are clearly identified, research directions to overcome these are suggested, and market analysis data is included. Advanced Nanomaterials for Inexpensive Gas Microsensors presents the latest research and most comprehensive coverage in the field of gas micro and nano sensors for research scientists, academics, graduate students, and R&D managers working on synthesis of nanomaterials and fabrication of sensing systems, in a wide range of areas in electrical and material engineering, physical chemistry, electrochemistry and physics. Presents technological solutions and applications of gas sensors in varied areas of chemistry, physics, material science, and engineering Examines advanced operating methods (e.g., temperature modulation, self-heating, light-activated response, noise methods) to enhance stability, sensitivity, selectivity and reduce power consumption Provides a critical review of current applications and their expected future evolution, demonstrating which are the most promising approaches and what can be expected from the development of inexpensive gas micro- and nanosensors**

THE UNIVERSITY OF VIRGINIA RECORD

ADVANCED ELECTRODE MATERIALS

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.

METHODOLOGIES AND APPLICATIONS FOR ANALYTICAL AND PHYSICAL CHEMISTRY

CRC Press **This volume presents an up-to-date review of modern materials and concepts, issues, and recent advances in analytical and physical chemistry. Distinguished scientists and engineers from key institutions worldwide have contributed chapters that provide a deep analysis of their particular subjects. The chapters discuss the composition and properties of complex materials as well as mixtures, processes, and the need for new and improved analytical technology.**

NANOBIOSENSORS

FROM DESIGN TO APPLICATIONS

John Wiley & Sons **Containing cutting edge research on the hot topic of nanobiosensor, this book will become highly read Biosensor research has recently re-emerged as most vibrant area in recent years particularly after the advent of novel nanomaterials of multidimensional features and compositions. Nanomaterials of different types and striking properties have played a positive role in giving the boost and accelerated pace to biosensors development technology. Nanobiosensors - From Design to Applications covers several aspects of biosensors beginning from the basic concepts to advanced level research. It will help to bridge the gap between various aspects of biosensors development technology and applications. It covers biosensors related material in broad spectrum such as basic concepts, biosensors & their classification, biomarkers & their role in biosensors, nanostructures-based biosensors, applications of biosensors in human diseases, drug detection, toxins, and smart phone based biosensors. Nanobiosensors - From Design to Applications will prove a source of inspiration for research on biosensors, their local level development and consequently using for practical application in different industries such as food, biomedical diagnosis, pharmaceutics, agriculture, drug discovery, forensics, etc. * Discusses the latest technology and advances in the field of nanobiosensors and their applications in human diseases, drug detection, toxins * Offers a broad and comprehensive view of cutting-edge research on advanced materials such as carbon materials, nitride based nanomaterials, metal and metal oxide based nanomaterials for the fast-developing nanobiosensors research * Goes to a wide scientific and industry audience Nanobiosensors - From Design to Applications is a resource for polymer chemists, spectroscopists, materials scientists, physical chemists, surface chemists, and surface physicists.**

COMPUTATIONAL CHEMISTRY METHODS IN STRUCTURAL BIOLOGY

Academic Press **Published continuously since 1944, the Advances in Protein Chemistry and Structural Biology serial has been a continuous, essential resource for protein chemists. Covering reviews of methodology and research in all aspects of protein chemistry, including purification/expression, proteomics, modeling and structural determination and design, each volume brings forth new information about protocols and analysis of proteins while presenting the most recent findings from leading experts in a broad range of protein-related topics. This volume features articles on Computational Chemistry methods in Structural Biology. Essential resource for protein chemists This volume features articles on Computational Chemistry methods in Structural Biology**

FUNDAMENTALS AND APPLICATIONS OF MICROFLUIDICS, THIRD EDITION

Artech House **Now in its Third Edition, the Artech House bestseller, Fundamentals and Applications of Microfluidics, provides engineers and students with the most complete and current coverage of this cutting-edge field. This revised and expanded edition provides updated discussions throughout and features critical new material on microfluidic power sources, sensors, cell separation, organ-on-chip and drug delivery systems, 3D culture devices, droplet-based chemical synthesis, paper-based microfluidics for point-of-care, ion concentration polarization, micro-optofluidics and micro-magnetofluidics. The book shows how to take advantage of the performance benefits of microfluidics and serves as an instant reference for state-of-the-art microfluidics technology and applications. Readers find discussions on a wide range of applications, including fluid control devices, gas and fluid measurement devices, medical testing equipment, and implantable drug pumps. Professionals get practical guidance in choosing the best fabrication and enabling technology for a specific microfluidic application, and learn how to design a microfluidic device. Moreover, engineers get simple calculations, ready-to-use data tables, and rules of thumb that help them make design decisions and determine device characteristics quickly.**

DEVELOPMENTS AND ADVANCES IN DEFENSE AND SECURITY

PROCEEDINGS OF MICRADS 2019

Springer **This book gathers the proceedings of the Multidisciplinary International Conference of Research Applied to Defense and Security (MICRADS), held at the Military Engineering Institute, Rio de Janeiro, Brazil, from 8 to 10th May 2019. It covers a variety of topics in systems, communication and defense; strategy and political-administrative vision in defense; and engineering and technologies applied to defense. Given its scope, it offers a valuable resource for practitioners, researchers, and students alike.**

ENDOPHYTES

POTENTIAL SOURCE OF COMPOUNDS OF COMMERCIAL AND THERAPEUTIC APPLICATIONS

Springer Nature **This book describes the various therapeutic and commercial applications of compounds produced by endophytes. Endophytes are microorganisms that reside in the living internal tissues of plants without showing any apparent symptom of their presence. During their life cycle, they establish a symbiotic or parasitic relationship with the host plant. The book discusses different kinds of compounds that these endophytes produce, and their potential properties such as antimicrobial, anti-oxidative, anti-inflammatory, anticancer, neutraceutical, immunomodulatory etc. Other prospects of entophytic biology such as fungi of wild and domesticated crop plants and their applications in sustainable agriculture have also been included. The book also provides details about various techniques used in endophyte research, metabolite detection and bioactivity-based assays to explore endophytes. Endophytes with phytohormones-producing potential and their role in plant —microbial interactions under stress are also discussed. The book also highlights novel strategies to tap into the hidden potential of endophytic fungi for the production of novel biomolecules using an integrated approach. These microorganisms have attracted a lot of scientific attention worldwide because of their huge potential for novel phytochemicals, pharmaceuticals and lead compounds. Hundreds of new novel endophytic fungi have been isolated, identified and systematically studied in last decade. However, this is the first of its kind, systematic compilation of potential biotechnological applications of endophytic compounds. Chapter contributions from groups across the globe make this book very up-to-date and informative. This book is very useful and interesting for students and researchers in the field of microbiology, plant sciences, mycology and pharmacology. It is also helpful for industry experts working on developing novel compounds.**

UNCONVENTIONAL LIQUID CRYSTALS AND THEIR APPLICATIONS

Walter de Gruyter GmbH & Co KG **The work focuses on recent developments of the rapidly evolving field of Non-conventional Liquid Crystals. After a concise introduction it discusses the most promising research such as biosensing, elastomers, polymer films , photoresponsive properties and energy harvesting. Besides future applications it discusses as well potential frontiers in LC science and technology.**

ADVANCED BIOSENSORS FOR VIRUS DETECTION

SMART DIAGNOSTICS TO COMBAT SARS-COV-2

Academic Press **Advanced Biosensors for Virus Detection: Smart Diagnostics to Combat Against the SARS-CoV2 Pandemic covers the development of biosensor-based approaches for the diagnosis and prognosis of viral infections, specifically coronaviruses. The book discusses wide-ranging topics of available biosensor-based technologies and their application for early viral detection. Sections cover the emergence of SARS-CoV, MERS-CoV and SARS-CoV2, the global health response, the impact on affected populations, state-of-the art biomarkers, and risk factors. Specific focus is given to COVID-19, with coverage of genomic profiling, strain variation and the pathogenesis of SARS-CoV2. In addition, current therapeutics, nano-abled advancements and challenges in the detection of SARS-CoV2 and COVID-19 management are discussed, along with the role of nanomaterials in the development of biosensors and how biosensors can be scaled up for clinical applications and commercialization. Deals with biosensors-based approaches that could be exploited to design and develop high throughput, rapid and cost-effective diagnostics technologies for the early detection of viral infections Illustrates the development of multiplexed, miniaturized analytical systems for point-of-care applications Provides information about fabrication protocols for various biosensor based diagnostic approaches that could be directly implemented to develop a novel biosensor Includes the past, present and future status of biosensors, along with information about biosensors currently under clinical trials**

REACTIVE AND FUNCTIONAL POLYMERS VOLUME THREE

ADVANCED MATERIALS

Springer Nature **Reactive and functional polymers are manufactured with the aim of improving the performance of unmodified polymers or providing functionality for different applications. These polymers are created mainly through chemical reactions, but there are other important modifications that can be carried out by physical alterations in order to obtain reactive and functional polymers. This volume presents a comprehensive analysis of these reactive and functional polymers. Reactive and Functional Polymers Volume Three considers advanced polymeric materials such as electroactive polymers, multi-responsive polymers, shape memory polymers, stimuli responsive polymers, and active and intelligent polymers as topics for analysis. World renowned researchers from Argentina, Austria, China, Egypt, France, India, Iran, Japan, Pakistan, Romania and Spain have participated in this book. With its comprehensive scope and up-to-date coverage of issues and trends in Reactive and Functional Polymers, this is an outstanding book for students, professors, researchers and industrialists working in the field of polymers and plastic materials.**

ADVANCED COMPOSITE MATERIALS

John Wiley & Sons **Composites materials is basically the combining of unique properties of materials to have synergistic effects. A combination of materials is needed to adapt to certain properties for any application area. There is an everlasting desire to make composite materials stronger, lighter or more durable than traditional materials. Carbon materials are known to be attractive in composites because of their combination of chemical and physical properties. In the recent years, development of new composites has been influenced by precision green approaches that restrict hazardous substances and waste created during production. This book ranges from the fundamental principles underpinning the fabrication of different composite materials to their devices, for example, applications in energy harvesting, memory devices, electrochemical biosensing and other advanced composite-based biomedical applications. This book provides a compilation of innovative fabrication strategies and utilization methodologies which are frequently adopted in the advanced composite materials community with respect to developing appropriate composites to efficiently utilize macro and nanoscale features. The key topics are: Pioneer composite materials for printed electronics Current-limiting defects in superconductors High-tech ceramics materials Carbon nanomaterials for electrochemical biosensing Nanostructured ceramics and bioceramics for bone cancer Importance of biomaterials for bone regeneration Tuning hydroxyapatite particles Carbon nanotubes reinforced bioceramic composite Biomimetic prototype interface**

APPLICATION OF BIG DATA, DEEP LEARNING, MACHINE LEARNING, AND OTHER ADVANCED ANALYTICAL TECHNIQUES IN ENVIRONMENTAL ECONOMICS AND POLICY

Frontiers Media SA

DEVELOPMENTS IN STRATEGIC CERAMIC MATERIALS

CERAMIC ENGINEERING AND SCIENCE PROCEEDINGS, VOLUME 36

John Wiley & Sons

ADVANCED VLSI DESIGN AND TESTABILITY ISSUES

CRC Press **This book facilitates the VLSI-interested individuals with not only in-depth knowledge, but also the broad aspects of it by explaining its applications in different fields, including image processing and biomedical. The deep understanding of basic concepts gives you the power to develop a new application aspect, which is very well taken care of in this book by using simple language in explaining the concepts. In the VLSI world, the importance of hardware description languages cannot be ignored, as the designing of such dense and complex circuits is not possible without them. Both Verilog and VHDL languages are used here for designing. The current needs of high-performance integrated circuits (ICs) including low power devices and new emerging materials, which can play a very important role in achieving new functionalities, are the most interesting part of the book. The testing of VLSI circuits becomes more crucial than the designing of the circuits in this nanometer technology era. The role of fault simulation algorithms is very well explained, and its implementation using Verilog is the key aspect of this book. This book is well organized into 20 chapters. Chapter 1 emphasizes on uses of FPGA on various image processing and biomedical applications. Then, the descriptions enlighten the basic understanding of digital design from the perspective of HDL in Chapters 2–5. The performance enhancement with**

alternate material or geometry for silicon-based FET designs is focused in Chapters 6 and 7. Chapters 8 and 9 describe the study of bimolecular interactions with biosensing FETs. Chapters 10–13 deal with advanced FET structures available in various shapes, materials such as nanowire, HFET, and their comparison in terms of device performance metrics calculation. Chapters 14–18 describe different application-specific VLSI design techniques and challenges for analog and digital circuit designs. Chapter 19 explains the VLSI testability issues with the description of simulation and its categorization into logic and fault simulation for test pattern generation using Verilog HDL. Chapter 20 deals with a secured VLSI design with hardware obfuscation by hiding the IC's structure and function, which makes it much more difficult to reverse engineer.

FOOD LIPIDS

SOURCES, HEALTH IMPLICATIONS, AND FUTURE TRENDS

Academic Press **Food Lipids: Sources, Health Implications, and Future Trends presents specific and updated details related to human health and emerging technologies to obtain valuable lipids and lipid analysis of food products. The book covers the most relevant topics of food lipids as main sources (animal, marine and vegetable) and their composition, the implication of different lipids in human health, the main degradative processes and analytical methods for quality. Written for nutrition researchers, food scientists, food chemists and chemical engineers, R&D managers, new product developers, and other professionals working in the food industry and academia, including students, this book is sure to be a welcomed reference. Lipids are vital for human nutrition as they provide energy to the biological processes of the body and contain substances with high importance as essential fatty acids or fat-soluble vitamins. Furthermore, lipids are responsible for many desirable characteristics of foods. However, in recent years consumers are increasingly aware of the diet-health relationship, especially the implication that some lipids exert in the development of different diseases. Provides clear information on obtaining, characterizing and applying lipids in several food products Offers strategies to apply new emerging technologies to the recovery of valuable lipids from food by-products, the use of innovative techniques of encapsulation to protect highly oxidizable lipids, and the use of this lipids to produce healthier foods Includes definitions, applications, literature reviews, recent developments, methods and end-of-chapter glossaries**

HANDBOOK OF RESEARCH ON TRIBOLOGY IN COATINGS AND SURFACE TREATMENT

IGI Global **Advances are continuously being made in applying the coatings and surface treatments by different techniques to reduce the damages from tribology. Engineers need more detailed information to compare the capability of each coating process in wear resistant and lubrication applications. It is also important to focus on the concepts of tribology in various applications such as the manufacturing process, bio implants, machine elements, and corrosive environments. The need for a comprehensive resource addressing these findings in order to improve wear resistance is unavoidable. The Handbook of Research on Tribology in Coatings and Surface Treatment evaluates the latest advances the fabrication of wear-resistant and lubricant coatings by different techniques and investigates wear-resistant coatings and surface treatments in various applications such as the automobile industry. Covering a wide range of topics such as lubricant coatings and wearable electronic devices, it is ideal for engineers, industry professionals, researchers, academicians, scholars, practitioners, instructors, and students.**

INNOVATIVE FOOD ANALYSIS

Academic Press **Innovative Food Analysis presents a modern perspective on the development of robust, effective and sensitive techniques to ensure safety, quality and traceability of foods to meet industry standards. Significant enhancements of analytical accuracy, precision, detection limits and sampling has expanded the practical range of food applications, hence this reference offers modern food analysis in view of new trends in analytical techniques and applications to support both the scientific community and industry professionals. This reference covers the latest topics across existing and new technologies, giving emphasis on food authenticity, traceability, food fraud, food quality, food contaminants, sensory and nutritional analytics, and more. Covers the last ten years of applications across existing and new technologies of food analytics Presents an emphasis on techniques in food authenticity, traceability and food fraud Discusses bioavailability testing and product analysis of food allergens and foodomics**

SMART MANUFACTURING

APPLICATIONS AND CASE STUDIES

Elsevier **Research efforts in the past decade have led to considerable advances in the concepts and methods of smart manufacturing. Smart Manufacturing: Applications and Case**

Studies includes information about the key applications of these new methods, as well as practitioners' accounts of real-life applications and case studies. Written by thought leaders in the field from around the world, Smart Manufacturing: Applications and Case Studies is essential reading for graduate students, researchers, process engineers and managers. It is complemented by a companion book titled Smart Manufacturing: Concepts and Methods, which describes smart manufacturing methods in detail. Includes examples of applications of smart manufacturing in process industries Provides a thorough overview of the subject and practical examples of applications through well researched case studies Offers insights and accounts of first-hand experiences to motivate further implementations of the key concepts of smart manufacturing

PRINTED ELECTRONICS

MATERIALS, TECHNOLOGIES AND APPLICATIONS

John Wiley & Sons **This book provides an overview of the newly emerged and highly interdisciplinary field of printed electronics • Provides an overview of the latest developments and research results in the field of printed electronics • Topics addressed include: organic printable electronic materials, inorganic printable electronic materials, printing processes and equipments for electronic manufacturing, printable transistors, printable photovoltaic devices, printable lighting and display, encapsulation and packaging of printed electronic devices, and applications of printed electronics • Discusses the principles of the above topics, with support of examples and graphic illustrations • Serves both as an advanced introductory to the topic and as an aid for professional development into the new field • Includes end of chapter references and links to further reading**

PURE AND FUNCTIONALIZED CARBON BASED NANOMATERIALS

ANALYTICAL, BIOMEDICAL, CIVIL AND ENVIRONMENTAL ENGINEERING APPLICATIONS

CRC Press **This book describes in a comprehensive manner latest studies conducted by various research groups worldwide focusing on carbon and related nanomaterials. Fourteen chapters of this book deal with a number of key research topics and applications of pure and functionalized carbon nanomaterials and their hybrid nanocomposites. Specifically, the authors have presented interdisciplinary investigations including: (i) carbon nanoparticles and layers synthesis, (ii) analytical aspects of carbon nanomaterials and their characterisation under different conditions as well as (iii) various applications of carbon nanoparticles. They have reported and summarised key applications of carbon particles or nanoobjects in pharmacy, biomedicine, agriculture and food industry, water treatment, physicochemical analysis, optoelectronics, electronic and magnetic materials for supercapacitors or radar adsorbing materials, tribology, chromatography, electrophoresis, bioanalysis, nanobiocatalysis, biofuels production as well as environmental remediation.**

NANOELECTRONICS AND MATERIALS DEVELOPMENT

BoD – Books on Demand **The current edited book presents some of the most advanced research findings in the field of nanotechnology and its application in materials development in a very concise form. The main focus of the book is dragged toward those materials where electronic properties are manipulated for development of advanced materials. We have discussed about the extensive usage of nanotechnology and its impact on various facets of the chip-making practice from materials to devices such as basic memory, quantum dots, nanotubes, nanowires, graphene-like 2D materials, and CIGS thin-film solar cells as energy-harvesting devices. Researchers as well as students can gain valuable insights into the different processing of nanomaterials, characterization procedures of the materials in nanoscale, and their different functional properties and applications.**

21ST CENTURY NANOSCIENCE

A HANDBOOK (TEN-VOLUME SET)

CRC Press **This 21st Century Nanoscience Handbook will be the most comprehensive, up-to-date large reference work for the field of nanoscience. Handbook of Nanophysics, by the same editor, published in the fall of 2010, was embraced as the first comprehensive reference to consider both fundamental and applied aspects of nanophysics. This follow-up project has been conceived as a necessary expansion and full update that considers the significant advances made in the field since 2010. It goes well beyond the physics as warranted by recent developments in the field. Key Features: Provides the most comprehensive, up-to-date large reference work for the field. Chapters written by international experts in the field. Emphasises presentation and real results and applications. This handbook distinguishes itself from other works by its breadth of coverage, readability and timely topics. The intended readership is very broad, from students and instructors to engineers, physicists, chemists, biologists, biomedical researchers, industry professionals,**

governmental scientists, and others whose work is impacted by nanotechnology. It will be an indispensable resource in academic, government, and industry libraries worldwide. The fields impacted by nanoscience extend from materials science and engineering to biotechnology, biomedical engineering, medicine, electrical engineering, pharmaceutical science, computer technology, aerospace engineering, mechanical engineering, food science, and beyond.

ION MOBILITY-MASS SPECTROMETRY

METHODS AND PROTOCOLS

Humana **This book focuses on ion mobility-mass spectrometry (IM-MS) and informatics approaches to improve traditional analysis of molecules by providing fundamentals and protocols for exploiting the potential of state-of-the-art IM-MS technology for the most common analytical applications. The chapters have been organized into four parts, each dealing with a particular set of IM-MS applications: 1) metabolomics and lipidomics; 2) proteomics and glycomics; 3) imaging and ambient ionization IM-MS; and 4) bioinformatic solutions for analyzing IM-MS data and deriving CCS values. Written for the highly successful Methods in Molecular Biology series, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Authoritative and practical, Ion Mobility-Mass Spectrometry: Methods and Protocols serves as an ideal resource for scientists delving into the technique's unprecedented analytical advantages, enabling novel qualitative and quantitative applications for the analysis of complex biological samples.**

CARBON- AND INORGANIC-BASED NANOSTRUCTURES FOR ENERGY APPLICATIONS

Frontiers Media SA

GRAPHENE SCIENCE HANDBOOK

ELECTRICAL AND OPTICAL PROPERTIES

CRC Press **Discover the Unique Electron Transport Properties of Graphene The Graphene Science Handbook is a six-volume set that describes graphene’s special structural, electrical, and chemical properties. The book considers how these properties can be used in different applications (including the development of batteries, fuel cells, photovoltaic cells, and supercapacitors based on graphene) and produced on a massive and global scale. Volume One: Fabrication Methods Volume Two: Nanostructure and Atomic Arrangement Volume Three: Electrical and Optical Properties Volume Four: Mechanical and Chemical Properties Volume Five: Size-Dependent Properties Volume Six: Applications and Industrialization This handbook describes the fabrication methods of graphene; the nanostructure and atomic arrangement of graphene; graphene’s electrical and optical properties; the mechanical and chemical properties of graphene; the size effects in graphene, characterization, and applications based on size-affected properties; and the application and industrialization of graphene. Volume three is dedicated to graphene’s electrical and optical properties and covers: Graphene and graphene nanoribbons for use in high-frequency transistors, energy-efficient electronics and photonic devices The interface of graphene/high-? dielectrics The strain-induced modifications of plasmons in graphene A possible advanced physical framework for treating graphenic structures Recent progresses in the electric lens based on graphene-like materials The thermal and thermoelectric transport properties of graphene A numerical method for simulating the electromagnetic field interaction with single-layer graphene and more**

PROTEIN MISFOLDING

Academic Press **Protein Misfolding, Volume 118, covers the wide spectrum of diseases and disorders that are attributed to protein misfolding, including degenerative and neurodegenerative, cardiovascular, renal, glaucoma, cancer, cystic fibrosis, Gaucher's disease, and many others. Specific chapters cover Mass spectrometric approaches for profiling protein folding and stability, Biomembranes, a key player in protein misfolding, how Genetic and environmental factors interact to disrupt proteostasis and trigger protein misfolding diseases, Formation of oligomers and large amorphous aggregates by intrinsically disordered proteins, Protein misfolding in ER stress with applications to cardiovascular and renal disease, and much more. Integrates methods for studying protein misfolding, factors that trigger this process and its role in a wide spectrum of diseases and disorders Contains timely chapters written by well-renowned authorities in their field Provides data that is well supported by a number of high quality illustrations, figures and tables, and targets a very wide audience of specialists, researchers and students**

BIOENERGY RESEARCH: BASIC AND ADVANCED CONCEPTS

Springer Nature **This volume is first part of the five-part set on bioenergy research. This volume covers current developments and both basic and advanced concepts in bioenergy production. Based on bioenergy road map, the book will also evaluate about the ratio existing between current challenges associated and practical implementation of these biofuels. The book complies up to-date progressive development in available bioenergy options and discusses opportunities and existing risks. The main objective of the book is to provide insights into the opportunities and required actions for the development of an economically viable bioenergy industry for practical replacement of fossil fuels. This book is of interest to teachers, researchers, scientists, capacity builders and policymakers. Also the book serves as additional reading material for undergraduate and graduate students of environmental sciences. National and international bioenergy scientists, policy makers will also find this to be a useful read. Other four volumes of this set explore latest developments, commercial opportunities, waste to energy and integrated solution for bioenergy concerns.**

BIOSENSOR BASED ADVANCED CANCER DIAGNOSTICS

FROM LAB TO CLINICS

Academic Press **Early diagnosis of cancer and other non-oncological disorders gives a significant advantage for curing the disease and improving patient's life expectancy. Recent advances in biosensor-based techniques which are designed for specific biomarkers can be exploited for early diagnosis of diseases. Biosensor Based Advanced Cancer Diagnostics covers all available biosensor-based approaches and comprehensive technologies; along with their application in diagnosis, prognosis and therapeutic management of various oncological disorders. Besides this, current challenges and future aspects of these diagnostic approaches have also been discussed. This book offers a view of recent advances and is also helpful for designing new biosensor-based technologies in the field of medical science, engineering and biomedical technology. Biosensor Based Advanced Cancer Diagnostics helps biomedical engineers, researchers, molecular biologists, oncologists and clinicians with the development of point of care devices for disease diagnostics and prognostics. It also provides information on developing user friendly, sensitive, stable, accurate, low cost and minimally invasive modalities which can be adopted from lab to clinics. This book covers in-depth knowledge of disease biomarkers that can be exploited for designing and development of a range of biosensors. The editors have summarized the potential cancer biomarkers and methodology for their detection, plus transferring the developed system to clinical application by miniaturization and required integration with microfluidic systems. Covers design and development of advanced platforms for rapid diagnosis of cancerous biomarkers Takes a multidisciplinary approach to sensitive transducers development, nano-enabled advanced imaging, miniaturized analytical systems, and device packaging for point-of-care applications Offers an insight into how to develop cost-effective diagnostics for early detection of cancer**

ADVANCEMENTS OF MASS SPECTROMETRY IN BIOMEDICAL RESEARCH

Springer **This volume explores the use of mass spectrometry for biomedical applications. Chapters focus on specific therapeutic areas such as oncology, infectious disease, and psychiatry. Additional chapters focus on methodology, technologies and instrumentation, as well as on analysis of protein-protein interactions, protein quantitation, and protein post-translational modifications. Various omics fields such as proteomics, metabolomics, glycomics, lipidomics, and adductomics are also covered. Applications of mass spectrometry in biotechnological and pharmaceutical industry are also discussed. This volume provides readers with a comprehensive and informative manual that will allow them to appreciate mass spectrometry and proteomic research, but also to initiate and improve their own work. This book acts as a technical guide as well as a conceptual guide to the newest information in this exciting field.**