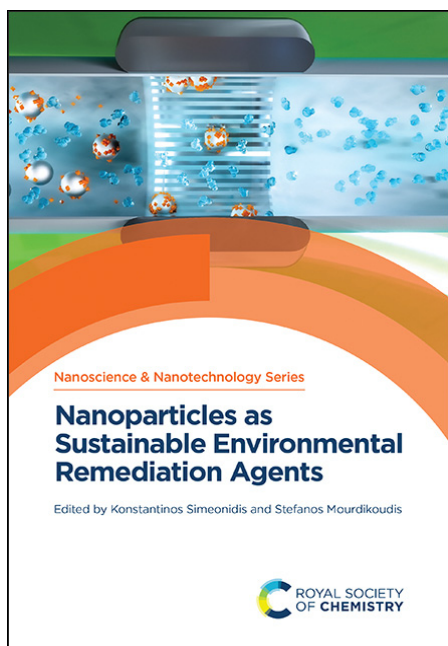


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THEMA: PDG, PDT, PNC, TBN

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Nanoparticles as Sustainable Environmental Remediation Agents

Konstantinos Simeonidis Aristotle University of Thessaloniki, Greece

Stefanos Mourdikoudis Flemish Institute for Technological Research (VITO), Belgium

Synopsis

The book aims to cover the intense research field looking at nanoparticle utilisation as remediation agents for the capture of toxic pollutants before reaching human consumption, either in primary or secondary organisms, or through aqueous and soil ecosystems in general. Special attention is given to aspects such as their post-application recovery, monitoring of their fate if released, risk assessment methods and life cycle analysis.

Brief Contents

- Applications of Nanoparticles and Nanomaterials in Bioremediation for Environmental Safety: An Overview
- Nanomaterials: Double-edged Sword as Pollution Busters or Pollutants?
- Soil Remediation Applications of Nanoparticles
- Source, Remediation and Health Effects of Nanoparticles in Urban Air
- Post-use Recovery of Nanoparticles
- Fate of Nanoparticles in Soil and Water
- Engineered Magnetic Nanoparticles as Environmental Remediation Agents
- Risk Assessment of Large-scale Nanoparticle Uses
- Multiphysics Simulation on Nanoparticle Environmental Paths and Recovery
- Advances and Challenges on the LCA Applied to Nanomaterials for Environmental Remediation
- Nanotoxicity Assessment of Engineering Nanoparticles
- X-ray Absorption Fine Structure Techniques: A Structural Probe for Addressing Remediation Mechanisms Using Nano-adsorbents

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Price: £85.00 | \$115.00

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Format: Hardback

Size: 234 x 156 (Royal 8vo) mm

Pages: 357

BIC: PNK, PNR, TGM, TJFD5

THEMA: 4TC, PNK, PNR, TGM, TJFD

BISAC: SCI013030, SCI013050, TEC008090, TEC021020

Chemistry of Semiconductors

Sergio Pizzini University of Milano-Bicocca, Italy

Synopsis

Authored by a leading expert in the field, this textbook will cover the synthesis, spectroscopic characterisation and optimisation of semiconductor materials, accounting for the most recent developments in the field of nanomaterials. This easily accessible text is appropriate for advanced undergraduates and postgraduates studying materials science and technology.

Brief Contents

- Thermochemistry of Semiconductors
- Role of Defects, Impurities and Deviations from the Stoichiometry in the Optoelectronic Properties of Semiconductors
- Physico-chemical Aspects of Growth Processes of Elemental and Compound Semiconductors
- Chemistry of Semiconductor Impurity Processing
- Semiconductor Nanomaterials

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Target Audience: Professional and scholarly

Format: Hardback

Size: 234 x 156 (Royal 8vo) mm

Pages: 443

BIC: PNRD, RNU

THEMA: PNRD, RNU

BISAC: SCI013050

Advances in Microwave-assisted Heterogeneous Catalysis

Jianli Hu West-Viginia University, USA

Benjaram M Reddy BITS Pilani, India

Synopsis

Historically, the field of heterogeneous catalysis has focussed on the design and optimisation of the catalytic materials. However, as these optimisations start to reach diminishing returns, attention has turned to non-conventional means for improving reaction conditions. Microwave-assisted catalysis has been demonstrated to be useful in a wide range of applications including ammonia synthesis, desulfurization and production of chemicals from biomass. This book begins with the basics of microwave heating and the role of microwaves in heterogeneous catalysis. It goes on to cover mechanisms of microwave specific reaction rate enhancement, microwave-assisted synthesis of porous, nonporous and supported metal catalysts, microwave augmented reactor technology and microwave-induced microwave catalysis.

Brief Contents

- Basics of Microwave Heating and Recent Advances
- Role of Microwaves in Heterogeneous Catalysis
- Microwave-assisted Synthesis of Nanostructured Oxide Catalysts
- Microwave-assisted Synthesis of Porous Materials
- Microwave Assisted Reactions with Solid Acid and Base Catalysts
- Activation of Stable Molecules by Microwave Catalytic Processing
- Microwave-assisted Depolymerization of Polymeric Materials
- Microwave-assisted Pyrolysis of Municipal Solid Wastes
- Microwave-assisted Catalytic Biodiesel Production
- Microwave-augmented Carbon Capture
- Microwave-assisted Catalytic Transformation of Biomass
- Microwave-assisted Extraction of Lignin from Biomass
- Microwave Catalysis in Energy and Environmental Applications
- Application of Microwave Irradiation for Fischer-Tropsch Synthesis
- Microwave-assisted Glycerol Conversion into Valuable Chemicals
- Non-uniform Microwave Heating of Heterogeneous Systems
- Scale-up of Microwave-assisted Heterogeneous Catalytic Processes

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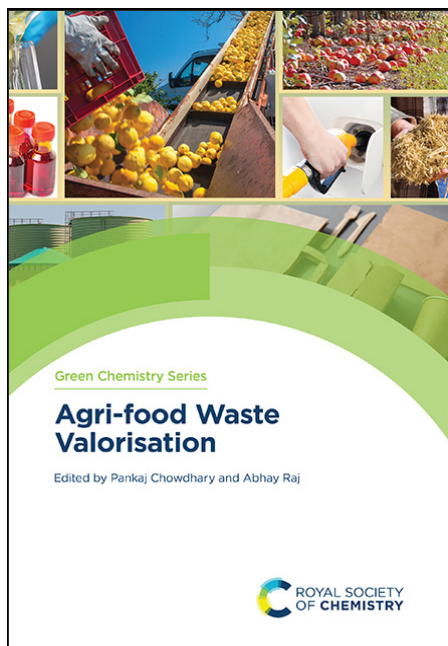
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Agri-food Waste Valorisation

Pankaj Chowdhary CSIR Indian Institute of Toxicology Research, India

Abhay Raj CSIR-Indian Institute of Toxicology Research, India

Synopsis

The agri-food industry creates a vast amount of waste each year. If current waste streams can be converted into useful resources this will have multiple benefits by reducing the amount of waste sent to landfill or similar, reducing the need for other feedstocks and removing the pressure from feedstocks that could be used as food. Covering the latest developments in the valorisation of food and agricultural waste, such as valorisation of citrus peel and industrial wastes, this book is a great resource for researchers interested in waste management, sustainability and the circular economy.

Brief Contents

- Valorisation of Agro-industrial Waste: Recent Advances in Recovery of Bioactive Compounds and Environmental Perspectives
- Agri-food Waste: An Adjuvant for the Management of Oxidative Stress-related Disorders?
- Sustainable Environmental Remediation by Valorization of Agro-food Industrial Waste and By-products
- Valorisation of Coproducts and By-products Obtained from Nuts
- Chemical and Biological Valorization of Tomato Waste
- Agro-wastes for Cost Effective Production of Industrially Important Microbial Enzymes
- Converting Agricultural Waste Biomass into Value-added Fuels *via* Thermochemical Processes
- Agri-food Waste to Biofuels: Current Trends and Challenges
- Valorization of Agricultural Residue Generated from Corn and Maize: Acquiring Valuables from Waste
- Advanced Food Waste Valorization Techniques for Bioenergy Production: A Path in the Direction of Environmental Sustainability
- Techno-economic Analysis for Low Cost In-vessel Food Waste Composting at Universiti Malaysia Sabah
- Techno-economic Analysis and Life Cycle Assessment of Value-added Products from Agri-food Waste

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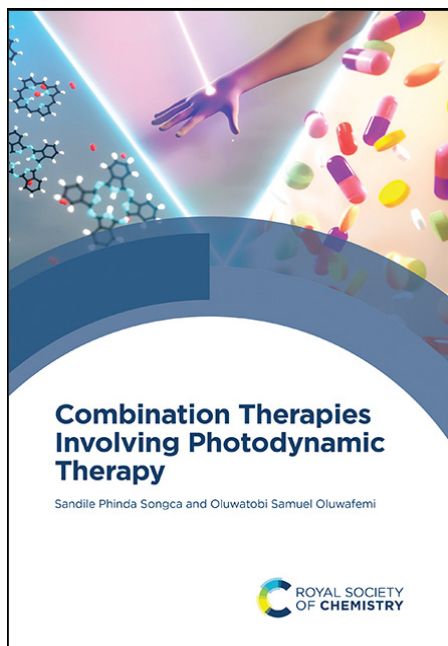
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THEMA: MJA, MJCL, MKS, MKZ, PNRL
BISAC: SCI013020, SCI013050

Combination Therapies Involving Photodynamic Therapy

Oluwatobi Oluwafemi University of KwaZulu-Natal,
South Africa

Sandile Phinda Songca University of KwaZulu-Natal,
South Africa

Synopsis

Photodynamic therapy (PDT) is increasingly used amongst health practitioners in combating a variety of diseases, most notably various types of cancer, and is often utilised in combination with other therapeutic options to enhance efficacy or reduce adverse reactions. This book reviews the current state of development of PDT and presents the foreseeable advancements of combination approaches to therapeutic strategies. It represents a novel approach to the therapeutic applications of five different technologies including the combinations of photodynamic therapy, photothermal hyperthermia therapy, magnetic hyperthermia therapy, chemotherapy, and cold atmospheric pressure plasma therapy. Ideal for students, researchers and practitioners in biological sciences, biotechnology, and photobiological and photochemical sciences, as well as medicinal and pharmaceutical chemistry.

Brief Contents

- Nanomaterials in PDT Combinations
- Basic Reflections on PDT
- Basic Reflections on Tumor Hypoxia
- Basic Reflections on Magnetic Hyperthermia
- Basic Reflections on Photothermal Hyperthermia Therapy
- Basic Reflections on Cold Atmospheric Pressure Plasma Therapy
- Basic Reflections on Chemotherapy
- Combination of PDT with Chemotherapy
- Combination of PDT with Magnetic Hyperthermia Therapy
- Combination of PDT with Magnetic Hyperthermia Therapy
- Combinations with Antimicrobial Chemotherapy
- Combinations with Cold Atmospheric Pressure Plasma Therapy
- Combinations with Sonodynamic Therapy
- Overall Opportunity Analysis

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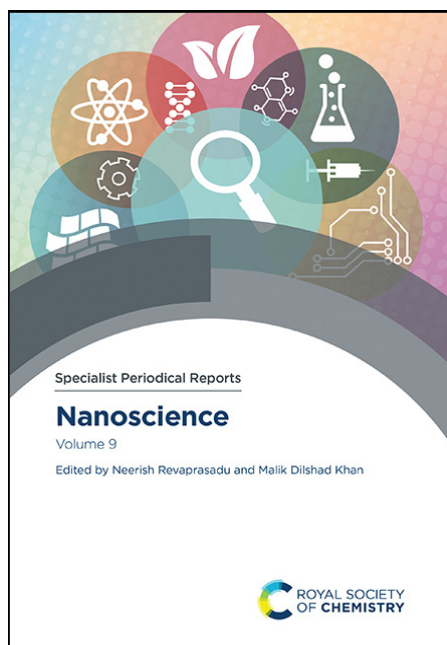
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Nanoscience Volume 9

Neerish Revaprasadu University of Zululand, South Africa
Malik Dilshad Khan University of Zululand, South Africa

Synopsis

The publications in nanoscience cross conventional boundaries from chemistry to specialised areas of physics and nanomedicine. With such a vast landscape of material, careful distillation of the most important discoveries helps researchers find the key information. Nanoscience provides a critical and comprehensive assessment of the most recent research and opinion from across the globe. Appealing to anyone practising in nano-allied fields or wishing to enter the nano-world, this useful resource provides a succinct reference on recent developments in this area now and looking to the future.

Brief Contents

- Carbon and boron based 2D nanomaterials: efficient lubricant additives
- Precious metal-carbon framework materials for supercapacitors
- Fundamentals of catalytic activities, recent progress, and perspectives in the oxygen reduction reaction
- Recent developments and challenges in flexible electrochemical energy devices
- Sustainable energy harvesting technologies with next-generation 3D magnetic nanostructures and nanocomposites
- Engineering metal/metal oxide nanoparticles for photocatalytic carbon dioxide reduction
- Nanomaterials for dye degradation
- Recent advances in single-atom catalysts for electrochemical water splitting
- Low-frequency noise spectroscopy of nano materials
- Nanotechnology for bacteriophages, bacteriophages for nanotechnology

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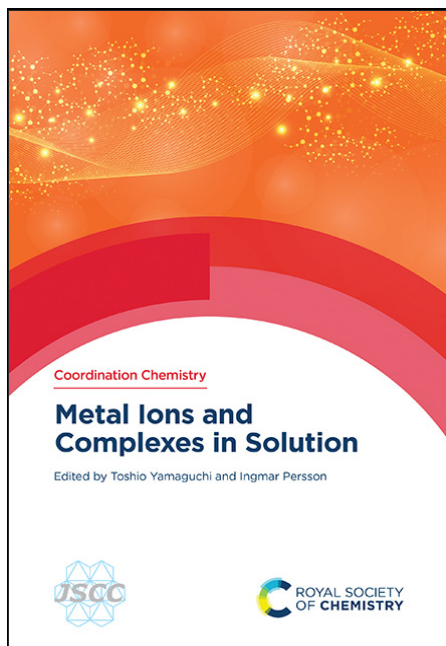
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Metal Ions and Complexes in Solution

Toshio Yamaguchi Fukuoka University, Japan
Ingmar Persson Swedish Agriculture University, Sweden

Synopsis

Based on a translated Japanese title published in 2012, this book provides fundamental aspects of experimental and computational methods, the properties and structure of solvents, ion solvation and equilibria and reactions of metal complexes in solution. It includes the state-of-the-art details on metal complexes in newly developing sustainable liquids and applications in real life. Appealing to researchers working in coordination chemistry, including students and industrialists, it uses exercises, tables and figures to help the reader with their understanding of the topic.

Brief Contents

- Thermodynamic Measurements (Potentiometry, UV-Vis Spectrometry and Calorimetry)
- X-ray and Neutron Scattering
- X-ray Absorption Spectroscopy
- Nuclear Magnetic Resonance
- Vibrational Spectroscopy
- Computational Approach
- Solvent Properties
- Solvent Structures
- Hydration and Solvation of Metal Ions
- Ion Solvation in Non-aqueous and Mixed Solvents
- Reactions of Metal Complexes in Solution
- Electron Transfer Reactions in Solution
- Metal Complexes in Supercritical Fluids
- Reactions and Equilibria of Metal Complexes Under High Pressure
- Metal Complexes in Ionic Liquids
- Metal Complexes in Micellar and Liquid Crystalline Solutions
- Inorganic Biochemistry
- Solvent Extraction
- Complex Formation in Hyperalkaline Solutions
- Resources Separation from Salt Lake Brine

Series: Coordination Chemistry Fundamentals

ISSN: 2635-1498

Publisher: Royal Society of Chemistry

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Pages: 330

BIC: PNK, PNND

THEMA: PNK, PNND

BISAC: SCI013030, SCI013040

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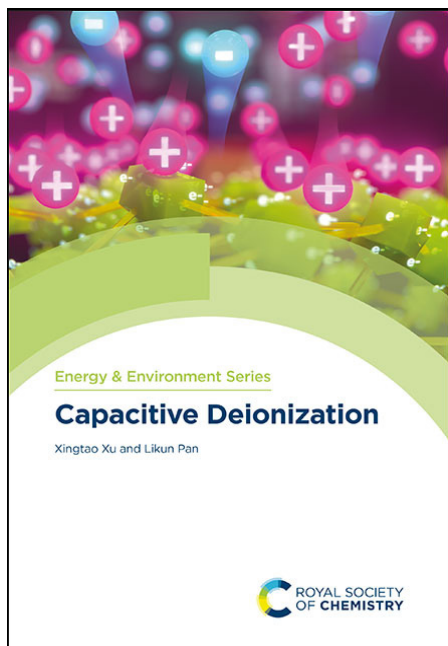
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Capacitive Deionization

Xingtao Xu Zhejiang Ocean University, China
Likun Pan East China Normal University, China

Synopsis

The exploration of new-family desalination techniques has become increasingly important in recent decades. Capacitive deionization (CDI) desalts saline water through storing ions in electrical double layers of porous carbons and is a promising alternative to commercial desalination techniques. This book showcases the fundamentals and progressive achievements of CDI over the years. Chapters cover theoretical models, the expansion of new-family electrode materials, exploitation of new-concept CDI devices and applications of CDI in new areas. Written by leaders in the field, **Capacitive Deionization** will be of interest to those interested in water desalination and purification, working across materials science, chemistry and environmental science.

Brief Contents

- Timeline of Capacitive Deionization: The Path to a New Era
- Carbon Nanomaterials for Capacitive Deionization: Heteroatom Doping and Its Functionalities
- Carbon Nanomaterials for Capacitive Deionization: Emerging Precursors via Pyrolysis
- Beyond Carbon Nanomaterials: The Rise of Faradic Nanomaterials
- Defining Capacitive Deionization from the Perspective of Faradic Nanomaterials
- Technological and Conceptual Evolution for Capacitive Deionization
- Membrane Capacitive Deionization
- Inverted Capacitive Deionization
- Flow-electrode Capacitive Deionization
- Hybrid Capacitive Deionization
- Capacitive Deionization for Ion Selective Capture
- Capacitive Deionization for Environmental Contamination Control
- Capacitive Deionization for Rare Metal Recovery
- Capacitive Deionization for Industrial Application: What Can We Expect?

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