Cucurbituril-based Functional Materials

Dönüs Tuncel Bilkent University, Turkey

Synopsis

Smart materials constructed through supramolecular assemblies have been receiving considerable attention because of their potential applications including self-healing materials, energy storage, photonic devices, sensors and theranostics. This book will provide an overview of the synthesis, properties and application of cucurbituril (CB) based nanostructures, as well as recent advances in the field. It will appeal to graduate students and researchers working in materials science, as well as those working on CB materials in organic and physical chemistry.

Brief Contents

- Cucurbituril containing functional materials in the context of smart materials
- Cucurbituril Homologues and Derivatives: Syntheses and Functionalization
- Key Roles of Cavity Portals in Host-Guest Binding Interactions by Cucurbituril Hosts
- Rotaxanes and polyrotaxanes
- Hybrid Supramolecular Assemblies of Cucurbit[n]uril Supported Metal and Other Inorganic Nanoparticles
- Cucurbituril-assisted Supramolecular Polymeric Hydrogels
- Cucurbituril containing supramolecular nanomaterials

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DNA Techniques to Verify Food Authenticity

Applications in Food Fraud

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Synopsis

Describing the science behind DNA as a target analyte, its extraction, amplification, detection and quantitation as applied to the detection of food fraud and food crime, this book covers this topical and growing area post the horsemeat scandal. Worldwide authorities in the area have been bought together to provide comprehensive coverage of all issues ranging from sampling of DNA through to emerging techniques such as next generation sequencing. It will appeal to a two-fold market – food-testing laboratories worldwide and food policy professionals and regulatory organisations who use these techniques to back up legislation.

Brief Contents

- Forensic DNA - Criminal and Paternity Aspects
- Overview of Sampling with a Focus on Subsequent PCR
- Extraction of DNA from Food
- Overview of DNA Techniques
- DNA Approaches Developed in the UK Food Authenticity Programme
- Ensuring Fitness for Purpose in Investigating Authenticity
- Next Generation Sequencing, NGS
- A Perspective on DNA Quantitation
- DNA in Food and Feed Legislation
- Introduction to The Case Studies

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Electronic Waste Management

G H Eduljee  Retired, UK
R M Harrison  University of Birmingham, UK

Synopsis
This new edition of Electronic Waste Management provides an updated overview of waste management across the world as well as presenting new chapters on current issues in recycling and waste management. It is an essential reference not only for those working in recycling and waste management but also for those working in manufacturing and product development who wish to consider the full lifecycle of their product. It also provides valuable insights for policymakers developing more environmentally sound and sustainable systems and strategies for the management of electronic waste.

Brief Contents
- Materials used in Manufacturing Electrical, Electronic and Related Equipment
- A Circular Economy for Consumer Electronics
- Electronic waste management in the UK: Arisings, Performance and Prospects
- Export to and Management of Electronic Waste in Africa
- Electronic waste management in the Asia-Pacific
- Traceability of Electronic Waste using Blockchain Technology
- Defining the Roles of Consumers and Companies in relation to Electronic waste

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Flow Chemistry
Integrated Approaches for Practical Applications

Santiago V Luis University Jaume I, Spain
Eduardo Garcia-Verdugo University Jaume I, Spain

Synopsis
In flow chemistry, reactions are performed in a reactor with the reactants pumped through it. It has the benefit of being easily scaled up and it is straightforward to integrate synthesis, workup and analysis into one system. This volume provides an update on recent advances in the field of flow chemistry, with special emphasis on new, integrated approaches for green and efficient chemistry. This book is a valuable resource for researchers in green chemistry, chemical engineers and industrial chemists working in the pharmaceutical and fine chemicals industries.

Brief Contents
- General Presentation
- Recent perspectives in catalysis under continuous-flow, Biotransformations under flow conditions
- Flow processes involving metals and organometallic processes from an industrial perspective
- Flow synthesis utilising solids
- Perspectives in phototransformations under flow conditions
- Electrochemistry under flow conditions
- Green synthetic tools based on safer reaction media, heterogeneous catalysis, and flow technology

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Immunosensors

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Eiichi Tamiya Osaka University, Japan

Synopsis
Immunosensors are widely used and are particularly important for diagnosis of diseases in remote environments as well as point-of-care devices. This book is a compilation of recent advances in several areas of immunosensors for multiple target analysis using laboratory based or point-of-care set-up. A selection of high quality representative examples from the past five years will be covered by expert scientists. Filling a gap in the literature, it showcases the multidisciplinary, innovative developments in this highly important area and provides pointers towards commercialisation. Providing a single, comprehensive work, it appeals to graduate students and professional researchers across academia and industry.

Brief Contents

- Introduction to Immunosensors
- Antibody’s Structure, Function, Orientation, Characterization and Immobilization for Immunosensor Development
- Immunosensing with Electro-Active Photonic Devices
- Nanostructured Based Plasmonic Device for Biosensing Applications
- Current Approaches in Quantifying IgE Antibody in Allergic Diseases
- Nanostructure Based Sensitive Electrochemical Immunosensors
- Repetitive Immunosensors
- Electrochemical Magneto Immunosensors As Fast and Efficient Tools for Point-of-Care Diagnostics

All information is subject to change without notice
Magnesium Batteries
Research and Applications
Maximilian Fichtner Helmholtz Institute Ulm, Germany

Synopsis
Magnesium batteries, in particular rechargeable non-aqueous systems, are an area of intense research as they present a sustainable energy storage system that has the potential to outperform Li-ion batteries. The book covers scientific and technical challenges, bringing together contributions in the field of anodes, cathodes, electrolytes and particularly promising systems such as the Mg–S cell. Edited by a leading name in the field, this title will appeal to students and researchers both new to and already working in battery materials across chemistry, physics, engineering and materials science.

Brief Contents
- Motivation for Magnesium Battery
- Non-aqueous electrolytes for Mg batteries
- Solid-State Magnesium-Ion Conductors
- Theoretical modelling of multivalent ions in inorganic hosts
- Anode materials for rechargeable Mg-ion batteries
- Mg stripping and plating at magnesium metal and intermetallic anodes
- Insertion Electrodes for Magnesium Batteries: Intercalation and Conversion
- High energy density insertion cathode materials
- Organic compounds as electrodes for rechargeable Mg batteries
- Magnesium-Sulfur Batteries

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Synthetic Polymer Chemistry

Innovations and Outlook

Zheng Zhao  The Hong Kong University of Science & Technology, Hong Kong
Rong Hu  South China University of Technology, China
Anjun Qin  South China University of Technology, China
Ben Zhong Tang  The Hong Kong University of Science and Technology, Hong Kong

Synopsis

The increasing demand for polymers with new structures and functions has inspired the development of new synthetic techniques. This book focuses on breakthroughs and progress in synthetic polymer chemistry, providing efficient tools for the synthesis of linear and topological polymers. Synthetic Polymer Chemistry will be a valuable reference for those working in polymer chemistry, as well as students and researchers interested in opto-electronic, biological and materials sciences.

Brief Contents

- New polymers from SuFEx click chemistry: syntheses and perspectives
- Thiol Chemistry for Precision Polymer Synthesis
- Precise Synthesis of Polyethylene-based Star Polymers: From Anionic Polymerization to Polyhomologation
- Fabrication of Supramolecular Polymers
- Olefins (Co)polymerizations Enabled by Catalyst Design Based on Side Arm Strategy
- Bimetallic Complexes Mediated Meso-epoxides Desymmetrization Copolymerization
- Carbon Dioxide Copolymer from Delicate Metal Catalyst: New Structure Leading to Practical Performance

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