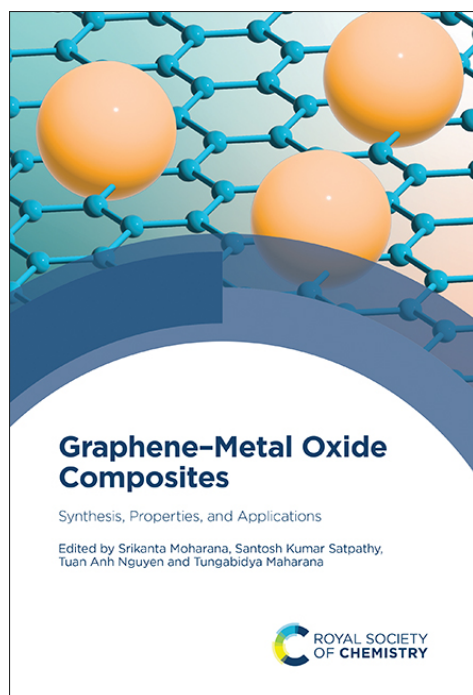


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Graphene–Metal Oxide Composites

Synthesis, Properties, and Applications

Srikanta Moharana Centurion University of Technology and Management, India

Santosh Kumar Satpathy Centurion University of Technology and Management, India

Tuan Anh Nguyen Vietnam Academy of Science and Technology, Vietnam

Tungabidya Maharana National Institute of Technology Raipur, India

Synopsis

Combining graphene with metal oxides offers new opportunities in areas such as biomedicine, renewable energy, and optoelectronics. This book discusses various approaches to the synthesis, processing, and characterisation of graphene–metal composites. Several chapters address the individual properties of composites while others focus on specific applications. Written with engineers and industrial researchers in mind, academic researchers will also benefit from this concise and contemporary resource.

Brief Contents

- Concepts and Recent Advancements of Graphene-based Metal Oxide Composites
- Graphene–Metal Oxide Composites: Structure, Properties and Applications
- Conventional Approaches to Synthesis and Deposition
- Graphene and Its Derivatives: Synthesis, Properties, and Applications
- Physical and Chemical Properties of Polymer Composites
- Magnetic Properties of Graphene-based Composites
- Effect of Rare-earth Impurities on the Structural, Dielectric and Electrical Properties
- Synthesis and Application of Graphene-based Composites
- Electrical and Chemical Properties of Polymer Percolative Composites
- Poly(Vinylidene Fluoride) Composites for Dielectric Applications
- Potential Candidates for Electronic and Optoelectronics
- Fabrication for Electromagnetic Shielding and Supercapacitor Applications
- Graphene/Transition Metal Oxide Nanocomposites for Oxygen Reduction Reaction
- Graphene–Metal Oxide Composite Electrode Materials for LIBs and SIBs
- Energy Storage Applications of Graphene–Metal Oxide Composites
- Graphene–Metal Oxide Composite Materials for Biomedical Applications
- Graphene–Metal Oxide-based Hybrid Materials for Fuel Cell Applications
- Application of Graphene–Metal Oxide Composites in Solar Cells
- Graphene–Metal Oxide Composite-based LEDs and Lasers
- Composites as Novel Adsorbents for Removal of Heavy Metals
- Composites for Electrochemical Energy Storage and Conversion
- Application of Composite Materials in Photocatalysis and Environment-related Areas
- Photoelectrochemical Applications of Graphene–Metal Oxide Composites
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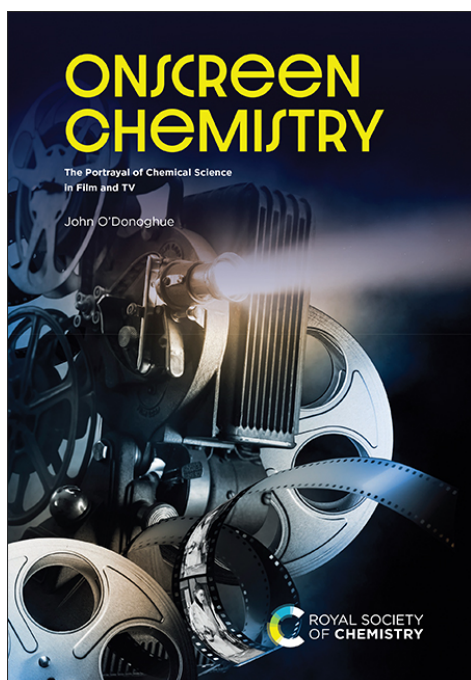
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Onscreen Chemistry

The Portrayal of Chemical Science in Film and TV

John O'Donoghue Trinity College Dublin, Ireland

Synopsis

Lights. Camera. *Reaction!*—How do real world discoveries affect what we see on screen? What impact does the world of film have on how we view chemistry? Are chemists the villains or the heroes? From Transylvania and Chernobyl to generic geniuses and meth makers, explore the fascinating world of the big and small screen through a chemist's eye as cinema and television are passed under the microscope. From the earliest silent films through to modern, multi-episode television, discover the real-life chemistry that inspired your favourite shows. Learn how depictions of chemists have changed through the years. Are chemists always pictured as relentless in their quest, are the dangers and risks accurately represented and did the image of chemistry teachers change after the portrayal of a teacher turned illicit drug supplier? Uncover the facts and fiction around these questions and many more with **Onscreen Chemistry**.

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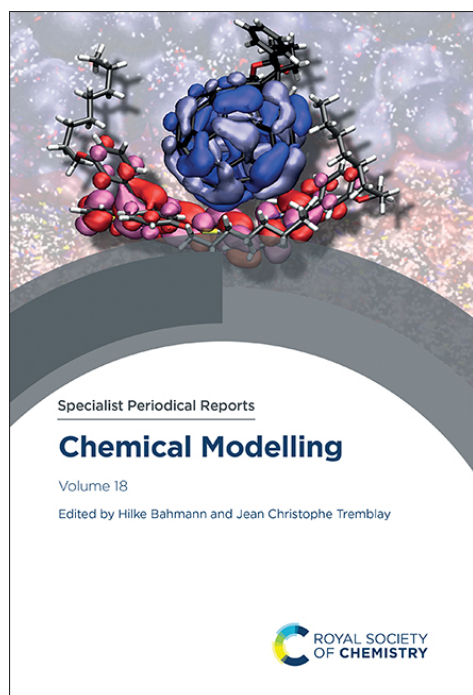
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Chemical Modelling

Volume 18

Hilke Bahmann Wuppertal University, Germany

Jean Christophe Tremblay Freie Universität Berlin, Germany

Synopsis

Chemical modelling covers a wide range of disciplines, and this book is the first stop for any chemist, materials scientist, biochemist, or molecular physicist wishing to acquaint themselves with major developments in the applications and theory of chemical modelling. Containing both comprehensive and critical reviews, it is a convenient reference to the current literature. Coverage includes, but is not limited to, adiabatic connection formalism in DFT, excited states in porous framework materials, proton-coupled electron transfer as a challenge for quantum chemical methods, modelling plasmon-assisted electron dynamics and atomistic modelling of large biological systems and the need for (un-)realistic approaches.

Brief Contents

- The adiabatic connection formalism in DFT: Theory and practice
- Electronic orbital responses of extended systems to static, homogeneous, electromagnetic fields
- Proton-coupled electron transfer as a challenge for quantum chemical methods
- Atomistic modeling of large biological systems and the need for (un-)realistic approaches
- Recent advances in modelling plasmon-assisted electron dynamics
- A theoretical chemistry approach to vibro-polaritonic chemistry with application to infrared spectroscopy and reaction kinetics

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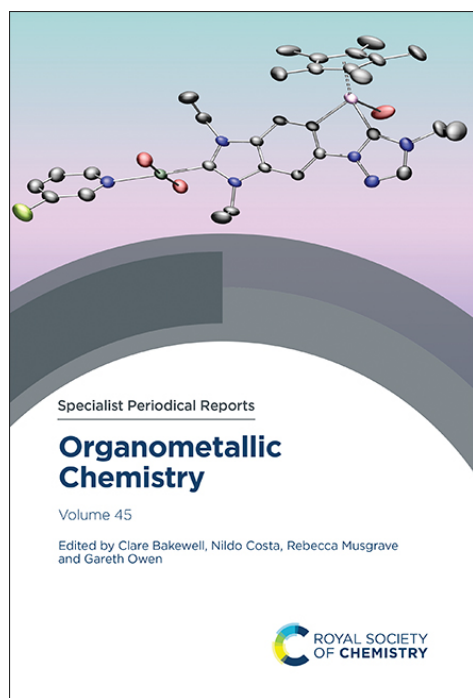
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Organometallic Chemistry

Volume 45

Clare Bakewell King's College London, UK

Nildo Costa The University of South Wales, UK

Rebecca Musgrave King's College London, UK

Gareth Owen The University of South Wales, UK

Synopsis

Compiled by a new editorial team, this volume provides an invaluable resource covering many aspects of organometallic and coordination chemistry. The book has been developed through contributions from future leaders in organometallic chemistry at the forefront of their research. With continued increases and expansion of chemical literature, researchers can find it challenging to keep up with recent developments. The volume provides a comprehensive overview of emerging themes and key developments in the field.

Brief Contents

- Synthesis and catalytic applications of heterobimetallic complexes involving bis-N-heterocyclic carbenes
- Preparation and reactivity of compounds containing group 10–group 13 element bonds
- The roles of Lewis acids in nickel catalysis
- Recent advances in iron-catalysed hydroboration
- Development of Mn(I)-based catalysts for CO₂ hydrogenation/dehydrogenation in the context of hydrogen storage/release systems
- Recent progress in dinitrogen functionalization: stoichiometric and catalytic reactions
- Photochemistry of main group metals and metalloids
- Catalysts based on the heavier group 13 elements for the cycloaddition of carbon dioxide to three-membered saturated heterocycles
- Computational strategies for modelling excited states in organometallic chemistry

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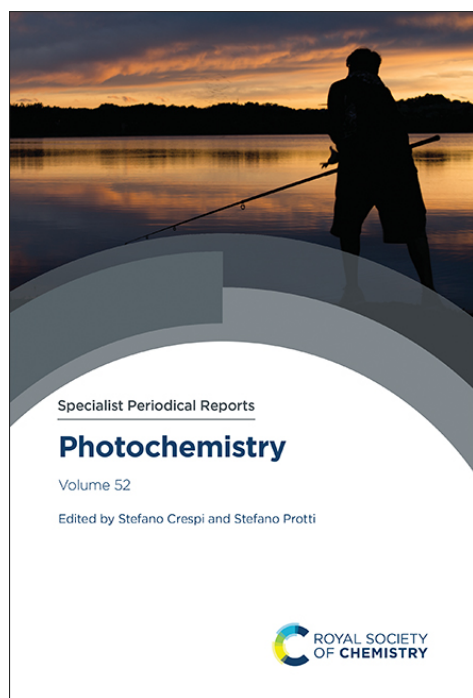
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Photochemistry

Volume 52

Stefano Crespi University of Groningen, The Netherlands

Stefano Protti University of Pavia, Italy

Synopsis

Reviewing photo-induced processes that have relevance to a wide number of academic and commercial disciplines, this volume reflects the current interests in chemistry, physics, biology and technology. Section one covers organic and computational aspects of photochemistry while Section two highlights topics like photomagnetism in Prussian blue and Prussian blue analogues, *in silico* photochemistry and delayed fluorescence in photosynthetic systems. The final section covers the SPR lectures on photochemistry. The volume continues to provide essential reading for postgraduates, academics and industrialists working in the field of photochemistry, enabling them to keep on top of the literature.

Brief Contents

- Part 1. Periodical Reports: Organic and Computational aspects (2022–2023)
 - Introduction of the year 2023
 - Computational photochemistry: advances in 2022–2023
 - Organic aspects: photochemistry of alkenes, dienes and polyenes (2022–2023)
 - Strategic use of light-driven transformations in recent total syntheses
 - Recent advances in photoorganocatalysis (2019–2023)
- Part 2. Highlights
 - Photomagnetism in Prussian blue and Prussian blue analogues: between coordination chemistry and solid state physics
 - Advances in 4- π -photocyclisation reactions
 - *In silico* photochemistry
 - Singlet oxygen in organic photochemistry
 - Delayed fluorescence in anoxygenic photosynthesis
 - Principles and recent developments in visible-light photoclick chemistry
 - Mechanistic investigation of light-driven catalysis for solar fuel formation
- Part 3. SPR Lectures on Photochemistry
 - Gold catalysis under visible light
 - Perfluoroalkylation of aliphatic substrates *via* photoinduced radical processes
 - Photocycloadditions of aromatic compounds with alkenes: the role of spin multiplicity

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