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Open access

The Sustainability of Science

How Science Impacts the Environment, and What Can Be Done

Martin Farley

Synopsis

Scientific research is a resource intensive activity, and it is growing quickly worldwide. Yet the problems of climate change and pollution are also becoming more severe. Many researchers are working to improve the sustainability of industries or products and are committed to reducing the environmental impact of everyday life. The important questions then are how can we measure the environmental impact of research and what steps can we take to minimise that impact? From energy use in the laboratory, through reducing single use plastics and even to looking at wider considerations for facilities design this book will be a comprehensive handbook for anyone wanting to improve the sustainability of their research.

Key Features and Highlights

- Provides a comprehensive handbook to enable you to start understanding and reducing the environmental impact of your research
- Covers diverse topics including use and disposal of lab plastics, energy considerations relating to computation and even travel
- Brings together a range of view points including researchers, technicians and funders

Brief Contents

- Foreword
- The Scientist's Guide to Designing a Sustainable Laboratory
- The Environmental and Carbon Impact of Plastics in Scientific Research: Reporting, Accountability and Action
- Green and Sustainable Chemistry for a Circular Economy
- Estimating and Reducing the Carbon Footprint of Academic Travel
- Scientific Equipment Sustainability
- Research Quality, Reproducibility
- Equity and Justice in the Global Scientific Enterprise
- Sustainable Digital Science
- Certifications and Standards
- Education for Sustainability and Equity in Research
- Technicians: The Front Line of Impact
- Environmental Sustainability in Science – View from a Funder
- Climate Activism in Science

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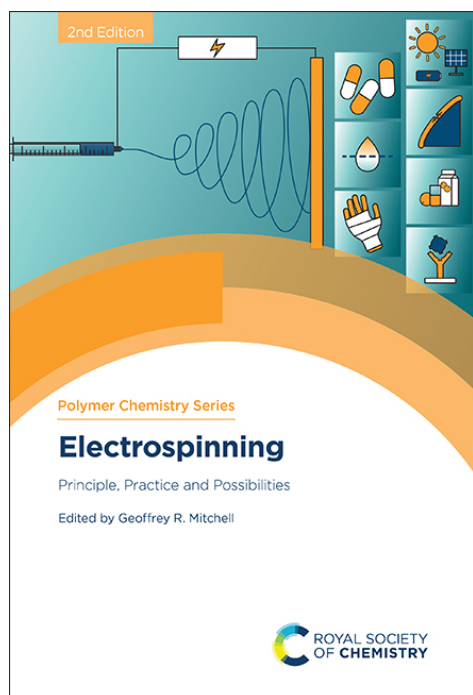
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Advance Book Information



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Publication Date: 11 March 2026
Target Audience: Professional and scholarly
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BIC: PNNP, TDH, PNRH, TGB, TDCP
THEMA: PNNP, TDPF, PNRH, TGMP
BISAC: TEC055000, SCI013100, TEC021000
Series: Polymer Chemistry Series
Volume 44

Electrospinning

Principle, Practice and Possibilities

Geoffrey R Mitchell Institute Polytechnic of Leiria, Portugal

Synopsis

Electrospinning techniques are used to produce novel nanoscale fibrous materials used in a diverse range of applications. The field has seen significant growth in the past 10 years and this new edition fully revised with new chapters added in more topical areas, in particular:

- Voltage polarity
- Nanofiber-based face masks

It provides a snapshot of the current cutting-edge developments of the field. This balanced and authoritative book will appeal to a broad audience of postgraduate students, industrial and academic researchers in the physical and life sciences as well as engineering.

Brief Contents

- Introduction
- Glossary of Terms
- The Development of Electrospinning Technologies for Commercial Application
- Structure Development in Electrospun Fibres
- Electrospinning of Biopolymers
- Nanoparticle/Nanofibres Composites by Colloid-electrospinning
- Organised Assembly of Electrospun Nanofibres: From 1D to 3D
- Voltage Polarity in Electrospinning: Way to Control Properties of Polymer Fibres
- Electrospinning for Medical Applications
- Design and Fabrication of Electrospun Nanofiber-based Face Masks
- Electro Spun Membranes for Separation Applications
- Design of Electrospinning Made Materials Using 3D Computational Simulation
- Future Perspectives on Electrospinning

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Audience:

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BIC: PNND, PNK, TQ

THEMA: PNND, PNK, TQ

BISAC: SCI013030, SCI013080

Series: Inorganic Materials Series
Volume 18

MOFs for Gas Adsorption and Separation

Sihai Yang University of Manchester, UK

Synopsis

MOFs for Gas Adsorption and Separation explores the cutting-edge world of metal–organic frameworks (MOFs), showcasing their transformative potential in gas storage and separation. This comprehensive guide explores the chemical and structural versatility of MOFs, highlighting their applications in capturing pollutants, CO₂, hydrocarbons, and water. With contributions from leading experts, the book offers a fundamental overview of MOF materials, their exceptional sorption properties, and the host–guest chemistry that drives their functionality. Ideal for advanced undergraduates, postgraduates, and researchers, this essential resource provides a historical context and a detailed examination in the context of contemporary inorganic materials science. Whether you're a scientist, engineer, or student, this book is your gateway to understanding the fast-developing field of MOFs and their impact on materials, energy, and the environment.

Key Features and Highlights

- Offers a focused overview of MOFs for gas adsorption and separation, addressing urgent challenges in clean air and carbon capture.
- Highlights recent industrial breakthroughs, including commercial deployment of MOF-based CO₂ capture systems.
- Covers emerging MOF technologies like water-stable frameworks and mixed-matrix membranes, aligning with current materials research trends.

Brief Contents

- MOFs for Hydrogen and Methane Storage
- MOFs for CO₂ Capture
- MOFs for Hydrocarbon Separations
- MOFs for Clean Air
- MOFs for Water Separation

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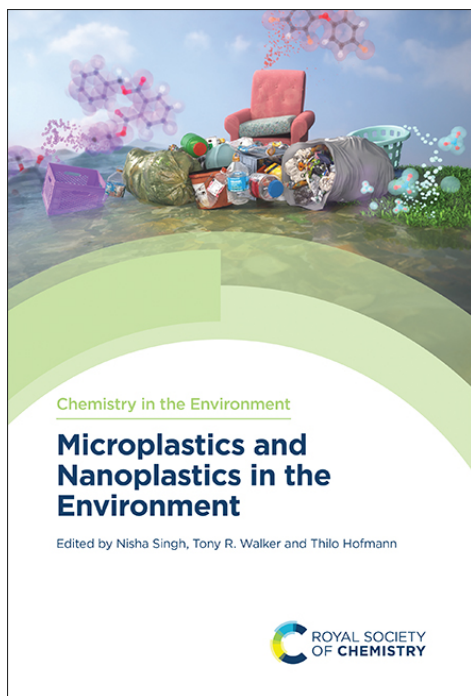
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Microplastics and Nanoplastics in the Environment

Nisha Singh Japan Agency for Marine-Earth Science and Technology, Japan

Thilo Hofmann University of Vienna, Austria

Tony R Walker Dalhousie University, Canada

Synopsis

Microplastics typically range in size from about 5 millimeters down to the lower micrometer scale, while nanoplastics extend to the smallest particles, with sizes down to 1 nanometer. Both types have now been found in every biome on the planet and can be detected in the air, in water, and even in the organs of the human body. Taking a broad look at the sources, fates and behaviours these particles **Microplastics and Nanoplastics in the Environment** is an ideal resource for researchers interested in environmental pollutants in general, plastic pollution in particular and pollution control, mitigation or remediation.

Key Features and Highlights

- Provides a broad overview of the sources of micro- and nanoplastics as well as their fate and impact in the environment.
- Discusses challenges and advances in analytical techniques and approaches to understanding degradation and other environmental processes.
- Offers insight into international regulations, negotiations and approaches to addressing plastic pollution.

Brief Contents

- Understanding Microplastics and Nanoplastics as Conventional and Emerging Contaminants in the Environment
- Sampling and Sample Preparation Techniques for Micro- and Nanoplastics
- Challenges and Advances in Analytical Techniques to Detect Micro- and Nanoplastics
- Plastic Currents: Distribution, Fate, and Risks of Micro- and Nanoplastics in Freshwater Systems
- Implications of Micro- and Nanoplastics in the Marine Environment
- The Fate and Risk of Micro- and Nanoplastics in Terrestrial Ecosystems
- Mass Transfer of Organic Compounds at Plastic Interfaces – Why Chemical Complexity and Environmental Factors Matter
- Micro- and Nanoplastic Processes: Degradation, Fragmentation, Aggregation and the Need for Environmentally Relevant Reference Materials
- Environmental Transport and Fate Modelling of Micro- and Nanoplastics
- Plastic Particles on the Plate: Impact on Food Security and Human Health
- Emerging Technology and Trends to Remove Micro- and Nanoplastics in Aquatic Media
- Regulations, International Negotiations and Transformative Approaches to Address Plastic Pollution

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Volume 18

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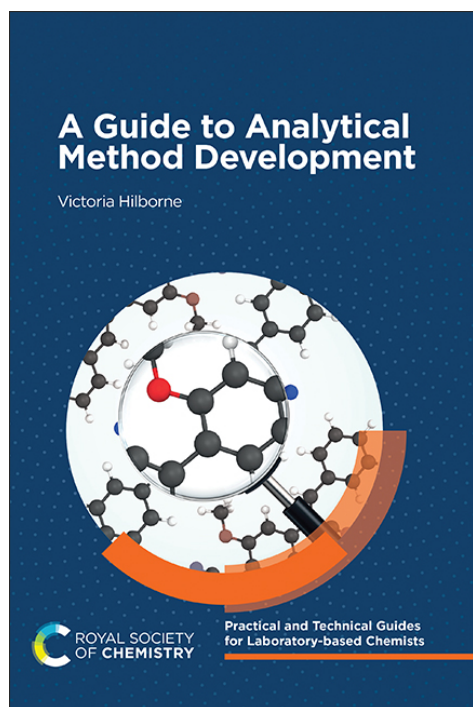
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Audience:

Size: 234 x 156 (Royal 8vo) mm

Pages: 92

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THEMA: PNF, PDN, 4CP

BISAC: SCI013010,

Series: Practical and Technical
Guides for Laboratory-based
Chemists Volume 3

A Guide to Analytical Method Development

Victoria Hilborne University College London, UK

Synopsis

Analytical chemists are often presented with a sample of unknown matter and there are reasonable steps to be taken to ascertain what that sample is. This book guides analytical chemists, at various stages of their careers, through the logical steps in planning and developing appropriate analytical measurement methods from selecting techniques for identification to method validation. It fills a gap in the literature where there are few, to no, general guides on what to consider when developing chemical measurement methods. Written for the novice, it is also appropriate for established analytical chemists looking for new ideas.

Key Features and Highlights

- Demystifies the process of identifying unknown matter, offering a clear, step-by-step guide to developing and validating chemical measurement methods - perfect for anyone facing the challenge of a new analytical problem.
- Provides a rare, comprehensive overview of method development - from managing complex sample matrices to selecting techniques and assessing data - making it an indispensable resource for both beginners and seasoned professionals.
- With a focus on minimizing cost and optimizing time, empowers readers to choose appropriate solutions, adapt existing methods and innovate with confidence - removing the stress of starting new projects or solving elusive measurement puzzles.

Brief Contents

- Introduction
- Sustainability in Analytical Science
- Principles for Method Development
- Considerations and Strategies
- Validity and Reliability of Analytical Measurement Methods: Data Analytics

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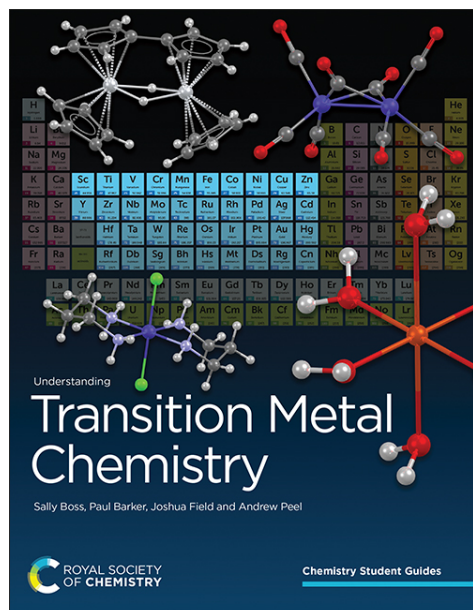
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Advance Book Information



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Understanding Transition Metal Chemistry

Sally Boss University of Cambridge, UK

Paul Barker University of Cambridge, UK

Joshua Field University of Oxford, UK

Andrew Peel The Cambridge Crystallographic Data Centre, UK

Synopsis

This book is part of the Chemistry Student Guides series and has been co-authored by lecturers and students from the Universities of Cambridge and Oxford and a structural scientist from the Cambridge Crystallographic Data Centre. The book provides a comprehensive grounding in first row transition metal chemistry. Two topics that are central to transition metal chemistry are coordination chemistry and organometallic chemistry and this book provides one text which builds students understanding of the structure, bonding and reactivity of all first-row transition metal compounds.

Brief Contents

- Transition Metals – Properties, Periodicity, Orbitals and Energy Levels
- Common Ligands for Transition Metals
- Bonding in Transition Metal Compounds: Part One
- Bonding in Transition Metal Compounds: Part Two
- The Spectrochemical Series
- Electron Counting and the 18-electron Rule
- Arene Complexes of Transition Metals
- Redox Chemistry of Transition Metals
- Transition Metal Complexes – Key Properties and Reactivities
- Catalytic Reaction Steps
- Catalytic Cycles

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Audience:

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BISAC: SCI013030

Series: Chemistry Student Guides
Volume 3

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