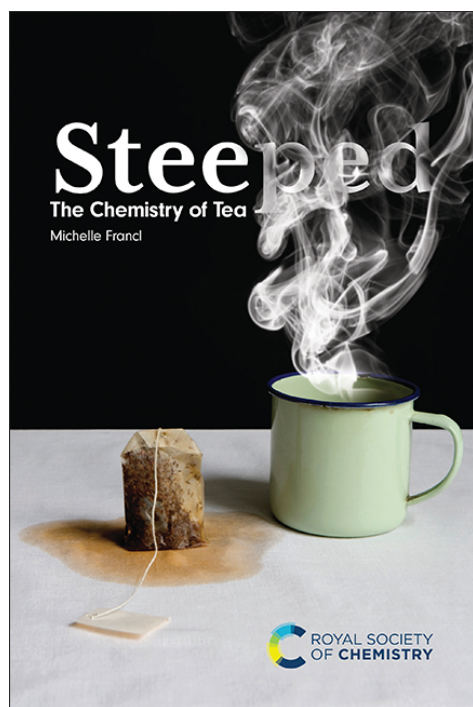


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Publisher: Royal Society of Chemistry

ISBN: PB 9781837071036
HB 9781839165917

Price: £14.99 | \$20.99 | €18.99

Publication Date: 07 July 2025

Date:

Target Audience: General/trade

Audience:

Size: 228mm x 152mm

Pages: 240

BIC: TDCT, PDZ

THEMA: PND, WBXN1, PDZ

BISAC: TEC012010,

Steeped

The Chemistry of Tea

Michelle Franci Bryn Mawr College & Vatican Observatory, USA

Synopsis

Now available to order in paperback, **Steeped** explores the chemistry behind tea, the world's most popular beverage. Brewed from the leaves of the *Camellia sinensis* plant, tea is drunk in countries all over the world, and the chemistry of both the plant and its preparation is fascinating. Beginning with a leaf to cup introduction, this book looks at the molecular makeup of different types of tea, discusses brewing and steeping and the age-old question of when, or even whether, to add milk.

Brief Contents

- A Cup of Chemistry
- Reading the Tea Leaves
- The Drug in the Cup
- The Taste of Zen
- The Agony of the Leaves
- Sugar and Spice
- Earth, Wind, Fire, and Water

Review

Like many good teachers, Franci scaffolds her knowledge with sip-sized summaries to go along with some of the deeper dives into the molecular world of tea.

Matthew R. Hartings, Nature Chemistry

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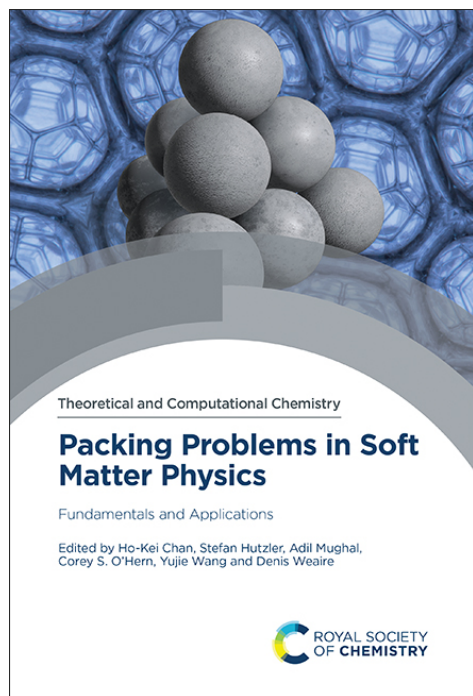
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Packing Problems in Soft Matter Physics

Fundamentals and Applications

Ho-Kei Chan Harbin Institute of Technology, China

Stefan Hutzler Trinity College Dublin, Ireland

Adil Mughal Aberystwyth University, UK

Corey S O'Hern Yale University, USA

Yujie Wang Chengdu University of Technology, China

Denis Weaire Trinity College Dublin, Ireland

Synopsis

Packing problems, which concern the optimal arrangements of objects in space, are cross-disciplinary in nature and have applications in mathematics, physics, chemistry, biology, engineering, and architecture. Such problems not only provide intellectual challenges for mathematicians but also yield useful solutions for physicists or chemists interested in understanding condensed matter's structural properties. This book provides a comprehensive overview of current trends in this emerging field of research.

Key Features and Highlights

- Provides an overview of packing problems that will be of interest across disciplines
- Covers topics such as ordered and disordered packings, and applications in biology

Brief Contents

- A Brief Overview of Packing Problems
- Packings of Spheres in Cylindrical Confinement
- Packings of Shape-anisotropic Particles in Quasi-1D Confinement
- Packing by Phyllotactic Planforms on Disks
- Symmetric Packings of Curvilinear Cylinders
- Amorphous Packings of Spheres
- Random Packings of Ellipsoidal Particles and Their Local Packing Properties
- Hyperuniform Quasi-long-range Correlations in Maximally Random Jammed Hard-particle Packings
- Deformable Particles: Modelling and Applications
- Packing Problems in Foams
- On the Role of Friction and Particle Size Distribution in Granular Packings
- On Transitions in Granular Packings Exposed to Compression
- Advances in Imaging of Granular Matter
- A Packing Perspective on the Glass-forming Ability of Particle-based Materials
- Seek "Order" Out of Disorder: An Exploration of the Structure of Amorphous Matter
- Machine-learning Methods for Amorphous Packings
- Packings of Charged Spheres
- Packings of Colloids for Optics and Wettability
- Self-assembly and Packings of Quasi-2D Suspensions of Colloidal Ellipsoids
- Packings of Soft Spheres Self-assembled from Block Copolymers
- Fractal Packings of Nanomaterials

Publisher: Royal Society of Chemistry

ISBN: HB 9781837671465
PDF 9781837673940
EPUB 9781837673957

Price: £219.00 | \$305.00 | €275.00

Publication Date: 27 August 2025

Target Audience: Professional and scholarly

Size: 234 x 156 (Royal 8vo) mm

Pages: 606

BIC: PHFC, PNR, UYM

THEMA: PHFC, PNRA

BISAC: SCI077000, SCI013050,
SCI013070

Series: Theoretical and
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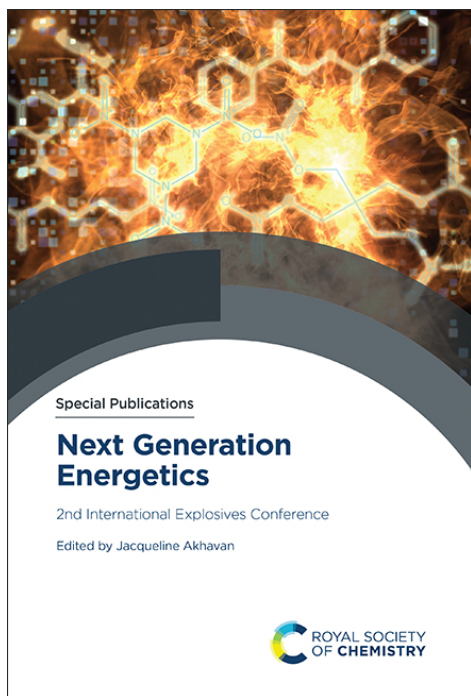
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Publisher: Royal Society of Chemistry

ISBN: HB 9781837671731
PDF 9781837677559
EPUB 9781837677542

Price: £99.99 | \$140.00 | €125.00

Publication Date: 18 July 2025

Date:

Target Audience: Professional and scholarly

Audience:

Size: 234 x 156 (Royal 8vo) mm

Pages: 240

BIC: TG, PNK, TH, PNR

THEMA: TG, PNK, TH, PNR

BISAC: TEC021000, SCI013030,
SCI013060

Series: Special Publications Volume
359

Next Generation Energetics

2nd International Explosives Conference

Jacqueline Akhavan Cranfield University, UK

Synopsis

Held for the second time in the UK, the international conference in explosives and other energetics took place in June 2024. This book contains the proceedings of this meeting and comprises unique, peer reviewed papers which are highly desirable for researchers in this field. Divided into two sections on synthesis, characterisation and diagnostics and artificial intelligence, simulation and modelling, the book captures the fundamental science of explosives and energetic materials that underpins deeper understanding of explosives, propellants, pyrotechnics and gas generators. All professionals from early careers through to subject matter experts will find topics of interest in this snapshot of research.

Key Features and Highlights

- This book contains papers presented at the 2nd International Explosives Conference organised in June 2024.
- Divided into two sections: Synthesis, Characterisation and Diagnostics and Artificial Intelligence, Simulation and Modelling, it provides a unique, peer reviewed snapshot of the latest details on the fundamental science of explosives and energetic materials.
- Is of interest to all professionals from early careers through to subject matter experts.

Brief Contents

- Synthesis, Characterization, and Energetic Performance of a New Copper Complex Based on 3,4,5-Trinitro-1H-Pyrazole
- The Growth and Shock Testing of Large Single Crystal Energetics and Analogues
- Calculating the Heat of Explosion for Non-ideal Explosives
- Degradation Kinetics of Sea-dumped Decoy Flares
- Computed Tomography of a Polymer Bonded Explosive
- The Effects of Surface Finish on the Signal Return for Het-V Experiments Using Copper
- Prediction of Material Properties of Energetic Materials Using Machine Learning Methods
- UCM/MMP Cookoff Models for Explosives Containing RDX
- Monte Carlo Analysis for Hot-spot Burning in Generalized Polygons
- Expansion of High-fidelity Physics Capabilities for Simulating the Detonation and Behaviour of Explosive Materials
- TATB Thermal Decomposition: An Improved Kinetic Model for Explosive Safety Analysis
- Using AI for the Discovery and Synthesis of Advanced Energetic Materials
- Numerical Framework for the Optimization of HVRB Parameters from Experimental Measurements
- Analysis of the Burning of Spheres and Cubes
- Analysis Technique for Reconstructing 2D Cylinder Wall Expansion
- Frictional Heating Measurements in PBX 9501

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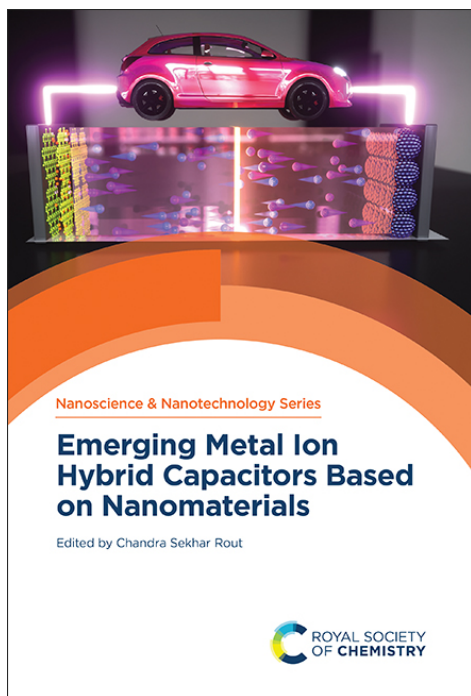
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Emerging Metal Ion Hybrid Capacitors Based on Nanomaterials

Chandra Sekhar Rout Jain University, India

Synopsis

Emerging Metal Ion Hybrid Capacitors Based on Nanomaterials covers recent developments, challenges and future perspectives of nanomaterials based metal ion hybrid capacitors for future energy storage devices. Edited by an expert in the field, the book is an essential companion for researchers, academics and industry workers.

Brief Contents

- Introduction
- Working Principles of Capacitors, Supercapacitors and Emerging Metal Ion Hybrid Capacitors
- Li Ion Hybrid Capacitors Based on Nanomaterials
- Na Ion Hybrid Capacitors Based on Nanomaterials
- Potassium Ion Hybrid Capacitors Based on Nanomaterials
- Mg Ion Hybrid Capacitors Based on Nanomaterials
- Al Ion Hybrid Capacitors Based on Nanomaterials
- Zn Ion Hybrid Capacitors Based on Nanomaterials
- Monovalent and Multivalent Metal Ion Hybrid Capacitors Based on Nanomaterials
- Applications of Metal Ion Hybrid Capacitors
- Summary

Publisher: Royal Society of Chemistry

ISBN: HB 9781837674190
EPUB 9781837678495
PDF 9781837678488

Price: £179.00 | \$250.00 | €225.00

Publication Date: 08 August 2025

Date:

Target: Professional and scholarly

Audience:

Size: 234 x 156 (Royal 8vo) mm

Pages: 318

BIC: THRH, THRB, TBN, TGM

THEMA: THY, TBN, TGM

BISAC: SCI013100,

Series: Nanoscience &
Nanotechnology Series
Volume 70

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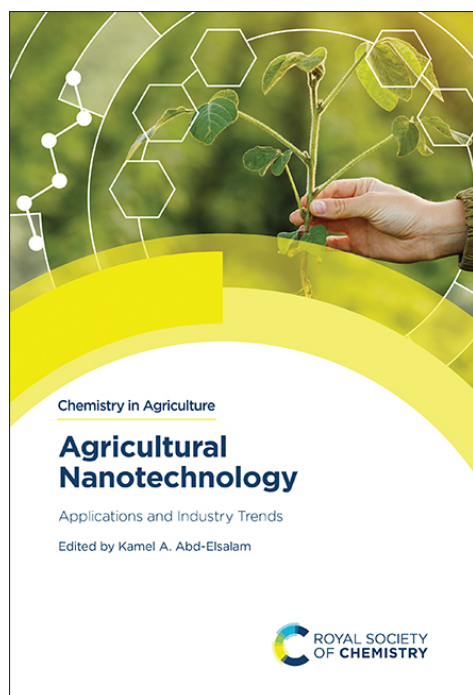
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Agricultural Nanotechnology

Applications and Industry Trends

Kamel A Abd-El Salam Agricultural Research Centre, Egypt

Synopsis

Agricultural nanotechnology offers solutions to industry challenges like food security and sustainability. This book explores nanoscale devices, materials, techniques, and agrochemicals, providing a global perspective with real-world examples. It emphasizes ethical implementation, addressing environmental and nanotoxicology concerns, and discusses regulatory implications. Case studies of successful products aim to inspire researchers and professionals.

Brief Contents

- Nano-agrochemicals: From Lab to Industry
- The Impact of Green Nanomaterials on the Agri-food Industry
- Nanoclay Composites: Innovative Agrochemical Delivery Systems for Enhanced Crop Production
- Nanofertilizers for Enhanced Nutrient Use Efficiency
- Graphene-based Nanomaterials Applied in Agriculture: Challenges, Applications, and Opportunities
- Engineered Biochar-based Nanocomposites for Enhanced Agricultural Productivity: A Sustainable Approach
- Nanoformulations for Postharvest Applications
- Nanoformulations for Safe and Effective Crop Protection
- Nanopesticides for Targeted Pest and Disease Management
- Nano-encapsulation for Controlled Release of Agrochemicals
- Nano-fungicides Industry: Status and Future Trends
- Nanotechnology in Weed Control and Herbicide Delivery
- Nanotechnology in Livestock and Animal Health
- Nanotechnology for Soil and Water Management
- Nanomaterials Health and Safety, and Regulation
- Scaling up Nanotechnology in Agribusiness
- Challenges and Opportunities in the Agricultural Nanotechnology Industry

Publisher: Royal Society of Chemistry

ISBN: HB 9781837674374
PDF 9781837677313
EPUB 9781837677320

Price: £219.00 | \$305.00 | €275.00

Publication Date: 08 August 2025

Date:

Target Audience: Professional and scholarly

Audience:

Size: 234 x 156 (Royal 8vo) mm

Pages: 558

BIC: TVB, TBN

THEMA: TVB, TBN

BISAC: TEC003080, SCI050000,
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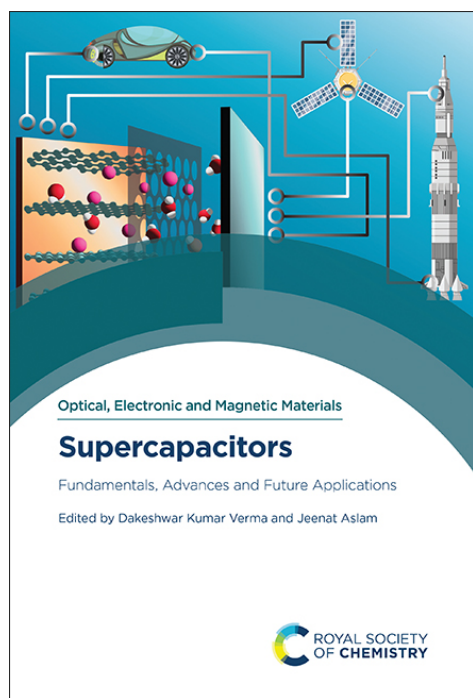
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Publisher: Royal Society of Chemistry
ISBN: HB 9781837674480
EPUB 9781837676682
PDF 9781837676774
Price: £219.00 | \$305.00 | €275.00
Publication Date: 26 September 2025
Target Audience: Professional and scholarly
Size: 234 x 156 (Royal 8vo) mm
Pages: 797
BIC: TJFD, THX, PNRH
THEMA: TJFD, THY, PNRH
BISAC: TEC008000, SCI013100,
SCI022000
Series: Optical, Electronic and
Magnetic Materials Volume 3

Supercapacitors

Fundamentals, Advances and Future Applications

Dakeshwar Kumar Verma Govt. Digvijay Autonomous Postgraduate College,
India

Jeenat Aslam Taibah University, Saudi Arabia

Synopsis

Combining high energy density and power delivery, supercapacitors are an attractive form of energy storage. Their rapid charge/discharge cycles and superior longevity are of particular interest to many industries, including transport, telecommunications, defence, and energy distribution.

The book begins with the fundamentals of this growing technology, including design principles and fabrication approaches. The second part of the book explores electrode materials. Combining this knowledge, applications from around the world and case studies show opportunities for commercialisation and sustainability.

Key Features and Highlights

- An in-depth exploration of the complete lifecycle of supercapacitors, from fundamental principles and design to industrial-scale manufacturing.
- Presents a wide range of electrode materials, including biomass feedstocks and composites, offering a broad perspective on material selection and innovation in supercapacitor design.
- Gives insight to real-world applications and opportunities for commercialisation.

Brief Contents

- Supercapacitors: Fundamentals, Design, Electrolytes and Interfaces
- Synthesis Methods, Fabrication and Performance Evaluation Techniques
- Solid-state Supercapacitors: Structure, Capacitance, Power and Energy Densities
- Characterization Techniques Applied for Electrode Materials
- Manufacture of Industrial Supercapacitors
- Conducting Polymer Based Composites as Electrode Materials
- MXene-based Composite Materials for Supercapacitors
- Carbon Allotrope-based Materials as Supercapacitors
- Binary Composites as Advanced Electrode Materials
- Ternary Composites as Advanced Electrode Materials
- Metal Oxide and Organic Semiconductor-based Supercapacitors (SCs)
- Hybrid Nanostructures as Advanced Electrode Materials for Supercapacitors
- Bioinspired Materials for Enhanced Supercapacitor Performance
- Batteries, Capacitors and Supercapacitors: Comparative Analysis
- Hybrid Energy Devices Based on Supercapacitors (Hybrid Supercapacitors)
- Computational Study of Electrode Materials Used in Supercapacitors
- Advanced Applications of Supercapacitors in Electric and Hybrid-electric Vehicle
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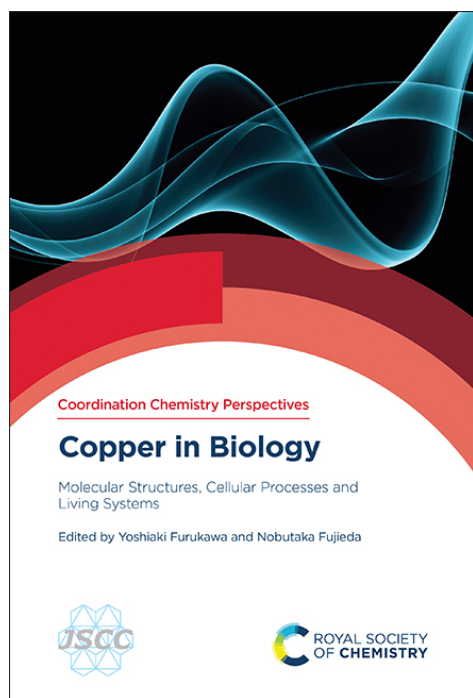
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Copper in Biology

Molecular Structures, Cellular Processes and Living Systems

Yoshiaki Furukawa Keio University, Japan

Nobutaka Fujieda Osaka Metropolitan University, Japan

Synopsis

Focusing on the biological significance of copper in our bodies, this book considers the maintenance of copper from different perspectives ranging from bio-inspired catalysts and mechanisms of copper proteins to pathological roles in diseases. Both quantity and quality of copper inside and outside the cell are essential for our health. Because of its high redox activity, copper acts as an active site for electron transfer and enzyme reactions in many proteins. Genetic and environmental disorders of copper metabolism are therefore associated with many diseases. In addition, copper-containing proteins are involved in the activation of molecular oxygen and have served as a good model for the development of inorganic copper complexes for industrial applications. Resulting from a 5-year project on Integrated Biometal Science in Japan, this book not only documents the latest research but also fills a gap between chemical understanding and our real life.

Brief Contents

- Structure and Function of Cu/Zn-superoxide Dismutase
- Structure and Function of Dinuclear Copper Tyrosinase
- Structure and Catalytic Mechanism of Copper/TPQ-containing Amine Oxidase
- Reaction Mechanism of Cytochrome c Oxidase
- Copper Chaperones and Copper Transporters in Health and Disease
- Multicopper Oxidase
- Wilson Disease, Crime of Copper
- Menkes Disease: The Pathological Mechanisms
- Clinical Features of Copper Deficiency
- Pathological Role of Copper and Cu, Zn-superoxide Dismutase (SOD1) in Amyotrophic Lateral Sclerosis (ALS)
- Canine Degenerative Myelopathy Caused by Mutations in the Cu²⁺/Zn²⁺ Superoxide Dismutase 1 Gene
- Down Syndrome-related Copper Disturbance in the Brain
- Copper Metabolism in Cancer Development and Therapy
- Blue Copper Protein Model Complexes
- Copper-based Superoxide Dismutase Enzyme Mimics: From Functional Models to Nanozymes
- Molecular Mechanism of Phenolase Activity of Tyrosinase
- Copper Complexes for Theranostics: From PET Imaging to Therapy
- Cancer-cell-selective Cytotoxicity of Dicopper Complexes with Various Amide-tether Dinucleating Ligands

Publisher: Royal Society of Chemistry
ISBN: HB 9781837674572
PDF 9781837677955
EPUB 9781837677962
Price: £199.00 | \$280.00 | €250.00
Publication 08 August 2025
Date:
Target Professional and scholarly
Audience:
Size: 234 x 156 (Royal 8vo) mm
Pages: 360
BIC: PNK, PNND, PSB
THEMA: PNK, PNND, PSB
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SCI007000
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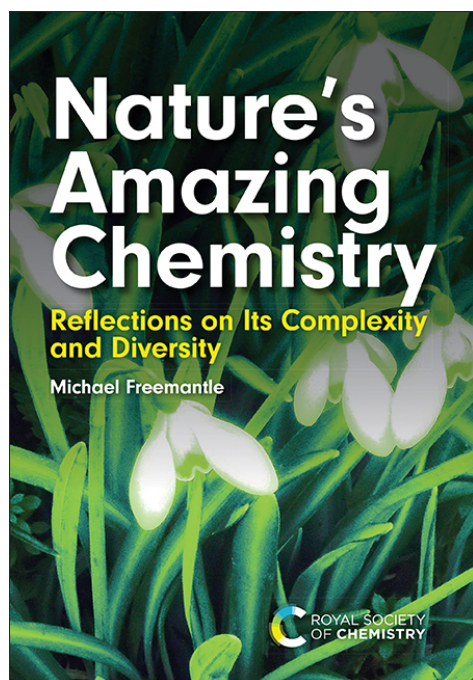
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Nature's Amazing Chemistry

Reflections on Its Complexity and Diversity

Michael Freemantle

Description

Nature's amazing chemistry has been producing all the raw materials essential for life on Earth for billions of years. The chemistry is, however, diverse and often complex and challenging. It has unfathomable depths that chemists and other scientists around the world are still attempting to probe and understand. Chapters in this book reflect Michael Freemantle's fascination with nature's chemistry not only of humans and other animals, but also of plants and minerals. You will discover:

- the chemistry of fruit flies, lobsters and beavers;
- the chemistry of snowdrops, wild cabbages and Himalayan blue poppies;
- the chemistry of minerals containing cobalt and other elements, the mining of which has in some cases led to environmental degradation and human rights abuses.

Michael Freemantle is a science writer who has written numerous books and articles on chemistry, the history of science and related topics. They include *The Chemists' War: 1914–1918* published by the Royal Society of Chemistry.

Brief Contents

- Nature's Chemical Treasure Trove
- The Scent of Beavers
- The Shepherd and The Draper
- Snakes and Hypertension
- Exotic Lobsters and Scarlet Ibises
- Toxic African Beetle Larvae
- Mediterranean Rock Snails and the Colour Purple
- Sleeping Beauties
- Keeping Time Day and Night
- Puddling in Mud
- Pigs and Pannage
- Dumb Cane
- Lady's Bedstraw
- The Common Snowdrop
- Himalayan Blue Poppies and Autumn Leaves
- An Ancient Blue Dye
- The First True Drug
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- Old Harry and Wild Cabbage
- Fixing Nitrogen
- Cobalt in Cornwall and the Congo
- Not Just a Nasty Gas
- The Rise and Fall of Mercury
- Blue John
- Dark Oxygen and Manganese Nodules
- The Secrets of Soil

Publisher:	Royal Society of Chemistry
ISBN:	HB 9781837674749 EPUB 9781837678068 PDF 9781837678051
Price:	£19.99 \$27.99 €24.99
Publication Date:	19 August 2025
Target Audience:	General/trade
Size:	228mm x 152mm
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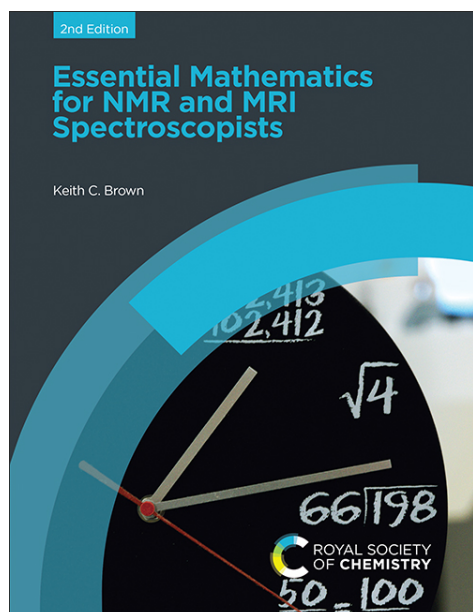
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Essential Mathematics for NMR and MRI Spectroscopists

Keith C Brown Retired, University of Saskatchewan, Canada

Synopsis

Thoroughly revised, this new edition begins by assessing the important areas of mathematics and then covers many of the underlying theoretical and practical aspects of NMR and MRI spectroscopy from a maths point of view. It bridges a gap between high level and introductory titles used in NMR or MRI spectroscopy taking a very careful pedagogical approach to the mathematics behind NMR and MRI. Coverage is comprehensive which distinguishes it from other books in the field. This essential text is aimed at graduate students beginning their careers in NMR or MRI spectroscopy and laboratory managers requiring the theoretical foundations of the technique.

Key Features and Highlights

- Provides comprehensive coverage of the important mathematics required to understand theoretical and practical aspects of NMR and MRI spectroscopy.
- Bridges a gap between high level and introductory titles used in NMR or MRI spectroscopy taking a very careful pedagogical approach to the mathematics.
- The author is sympathetic to the frustrations of trying to understand where some of the fundamental equations come so either explicitly derives all equations for the reader or directs them to derivations.

Brief Contents

- Complex Numbers
- Matrices
- Vectors
- Vector Calculus
- Introductory Tensor Analysis
- Probability and Statistics
- Waves
- Fourier Transforms
- Introductory Classical Mechanics
- Electric and Magnetic Fields
- The Magnetic Moment and the Bloch Equations
- Introductory Quantum Mechanics
- The Hamiltonians of NMR
- The Quantum Mechanics of Angular Momentum
- NMR Rotation Operators
- Density Operators and Matrices
- The Product Operator Formalism
- Coherence Transfer
- Relaxation and the NOE
- Dynamic NMR Spectroscopy
- Data Processing
- Magnetic Resonance Imaging
- Electronics

Publisher:	Royal Society of Chemistry
ISBN:	HB 9781837678778 PDF 9781837678785 EPUB 9781837678792
Price:	£99.00 \$138.00 €123.75
Publication Date:	12 September 2025
Target Audience:	College/higher education, , Professional and scholarly
Size:	Crown
Pages:	511
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