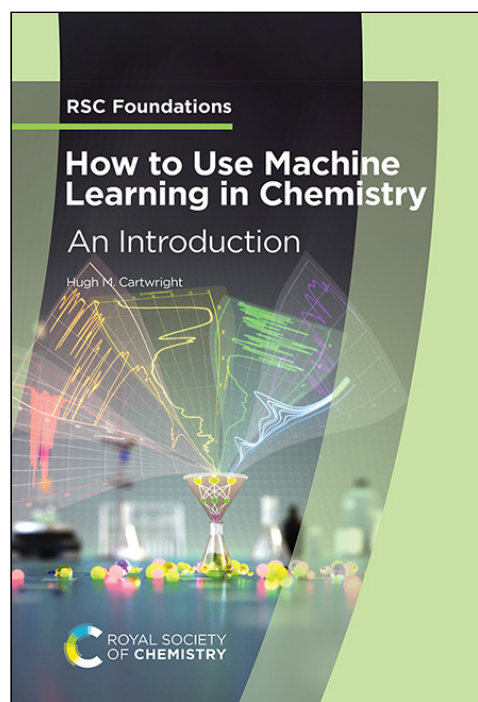


Advance Book Information



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How to Use Machine Learning in Chemistry

An Introduction

Hugh M Cartwright Oxford University (retired), UK

Synopsis

Written as a primer for anyone new to the area of machine learning this book provides an overview of the principles that underly its use in science together with how it can be a practical tool in research. Readers will develop an understanding of key terminology in the field and learn about critical factors that must be taken into account if machine learning is to be used successfully in scientific research.

Key Features and Highlights

- Offers a practical and concise starting point for those new to the field
- Provides a broad coverage at an accessible level
- Authored by a well-respected researcher known for their engaging and accessible writing style

Brief Contents

- Introduction
- Learning and Training
- Structure of a Machine Learning Model
- How Do We Know When Training Should End?
- The (Several) Roles of Random Numbers
- Hyperparameters: How to Make a Good Model Better
- How to Bungle Training in a Few Easy Steps
- Further Ways to Improve the Model and Data
- Representation, Descriptors and Properties
- Bayesian Optimisation
- Can We Understand How Machine Learning Models Reason?
- Other Types of Network
- A Glance Ahead

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Date:

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THEMA: PNRA, UYQM

BISAC: SCI013050, COM004000,
COM072000

Series: RSC Foundations Volume 8

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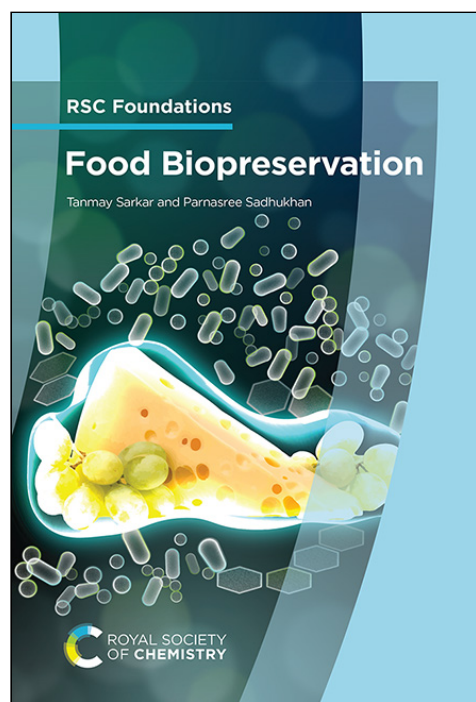
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Food Biopreservation

Tanmay Sarkar West Bengal State Council of Technical Education, India
Parnasree Sadhukhan J D Birla Institute, India

Synopsis

This book explores the chemistry and practical application of natural food preservation techniques using biopreservatives sourced from microorganisms, plants and animals. It highlights key bioactive agents and their roles in enhancing food safety, extending shelf life and maintaining quality across diverse food systems. Designed for both academic and industry professionals, the book offers targeted solutions tailored to specific food matrices, including optimal concentration ranges and storage conditions. Backed by current market data indicating growth in the biopreservatives sector, it positions natural preservation as a compelling alternative to chemical additives – one that supports both environmental stewardship and public health.

Key Features and Highlights

- Covers biopreservation across all major food categories (dairy, meat, seafood, fruits/vegetables) with detailed mechanisms of action, specific applications and regulatory frameworks.
- Bridges academic research with commercial implementation by including real-world case studies, regulatory approval status (FDA GRAS, EFSA classifications), acceptable limits for different biopreservatives and detailed tables showing targeted microorganisms and storage conditions.
- Addresses the growing consumer demand for natural preservation methods by covering emerging technologies like nanoencapsulation, synergistic combinations, active packaging innovations and sustainable approaches using food industry by-products.

Brief Contents

- Foundations of Biopreservation in Foods
- Classification of Biopreservatives in Food Systems
- Applications of Biopreservatives in Dairy Products
- Applications of Biopreservatives in Meat and Meat Products
- Applications of Biopreservatives in Seafood
- Applications of Biopreservatives in Fruits and Vegetables
- International Standards and Safety Regulations for Biopreservatives
- Conclusion

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Date:

Target Audience: Professional and scholarly

Audience:

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Pages: 116

BIC: TDCT, PN

THEMA: TDCT, PND

BISAC: TEC012000, SCI013000

Series: RSC Foundations Volume 9

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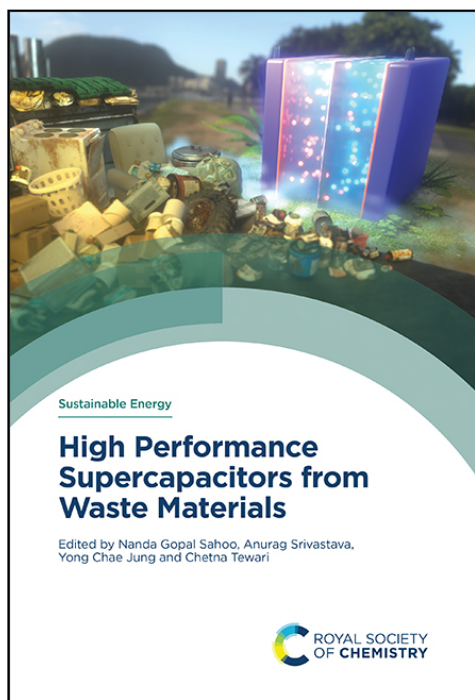
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THEMA: THY, RNH, PNRH, TBN
BISAC: SCI024000, TEC010020,
SCI013100, SCI050000,
TEC010000
Series: Sustainable Energy Volume 7

High Performance Supercapacitors from Waste Materials

Nanda Gopal Sahoo Kumaun University, India

Anurag Srivastava IIITM, India

Yong Chae Jung KIST, Republic of Korea

Chetna Tewari KIST, Republic of Korea

Synopsis

This book delves into the use of processed waste materials as electrode materials for supercapacitor applications, in an intriguing effort towards promotion of environmentally friendly approaches that align with the principles of sustainability and resource utilization. Waste-derived electrodes can offer several advantages, including cost-effectiveness, reduced environmental impact, and the potential for upcycling.

Key Features and Highlights

- The book offers a comprehensive and interdisciplinary exploration of converting diverse waste streams into high-performance supercapacitor materials, integrating electrochemical fundamentals, fabrication techniques, and computational modelling.
- It uniquely combines environmental and economic analyses with advanced materials science, addressing global sustainability goals and circular economy strategies through practical case studies and policy perspectives.
- With contributions from internationally recognized researchers across Asia, Europe, and North America, the volume ensures global relevance and appeal for academics, industry professionals, and policymakers.

Brief Contents

- Supercapacitors: Fundamentals
- Waste as a Valuable Resource: Trash to Treasure
- Waste-derived Carbon-based Materials: The Backbone of Supercapacitors
- Upcycling of Solid Waste into Graphene and its Derivatives for Supercapacitors
- Upcycling of Solid Waste into Carbon Nanotubes for Supercapacitors
- Upcycling of Solid Waste into Quantum Dots for Supercapacitors
- Turning Solid Waste into Valuable Carbon Nanomaterials: An Insight for Supercapacitive Electrode Applications
- Impact of Biomass Waste in Supercapacitor Technology
- Quantum Capacitance Computation for Identification of Supercapacitor Electrodes
- Environmental and Economic Considerations
- Super Capacitors: Future Trends and Innovations, Advances in Waste Conversion Technologies, Novel Materials and Manufacturing Techniques

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THEMA: PNRD, PNC, TQK
BISAC: SCIO13050, TEC010010, TEC010000
Series: Chemistry in the Environment
Volume 19

Metal-based Catalysts for Advanced Oxidation Processes

Applications in the Degradation of Organic Pollutants

Enyioma C Okpara North-West University, South Africa

Taiwo W Quadri University of South Africa, South Africa

Chandrabhan Verma King Fahd University of Petroleum and Minerals, Saudi Arabia

Damian C Onwudiwe North-West University, South Africa

Eno E Ebenso University of South Africa, South Africa

Craig E Banks Manchester Metropolitan University, UK

Synopsis

Advanced oxidation processes (AOPs) are well established as techniques for environmental decontamination. They are particularly key in the treatment of organic pollutants in drinking water and in industrial wastewater. AOPs require the generation of reactive oxygen species, this generation can be facilitated with catalysts. Metal-based heterogeneous catalysts have been extensively investigated for their high catalytic performance in AOPs. This book brings together the application of these catalysts in AOPs for the degradation of persistent organic pollutants in water treatment, looking at both the laboratory and the industrial scale.

Key Features and Highlights

- Looks at applications across both laboratory-scale and industrial-scale
- Explores various classes of catalysts, including metal oxides, metal sulphides, metal polymers and more
- Provides information on both synthesis and mechanisms of pollutant degradation

Brief Contents

- An Overview of Advanced Oxidation Processes
- An Overview of Persistent Organic Pollutants in Water
- Metal-based Catalysts in AOPs
- Metal Oxide Heterojunctions in Photocatalytic Pollutant Degradation
- Metal Sulfide-based Catalysts in Advanced Oxidation Processes
- Metal Selenide-based Catalysts in AOPs
- Metal-Graphitic Carbon Nitride-based Catalysts in AOPs
- Metal-Biochar-based Catalysts in Advanced Oxidation Processes
- Metal-Carbon Nanotube Catalysts in AOPs
- Metal-Graphene and Graphene Oxide-based Catalysts in AOPs
- Metal-Polymer Catalysts in AOPs
- Metal-Schiff Base Complex Catalysts in Advanced Oxidation Processes
- Metal-Organic Framework (MOF)-based Catalysts in Advanced Oxidation Processes
- Metal-chelate-based Catalysts in AOPs
- Nano Zero-valent Iron (nZVI)-based Catalysts in Persulfate-based AOPs
- Metal-based Catalysts for Non-radical Advanced Oxidation Processes
- Emerging Trends, Opportunities and Bottlenecks in Metal-based AOPs

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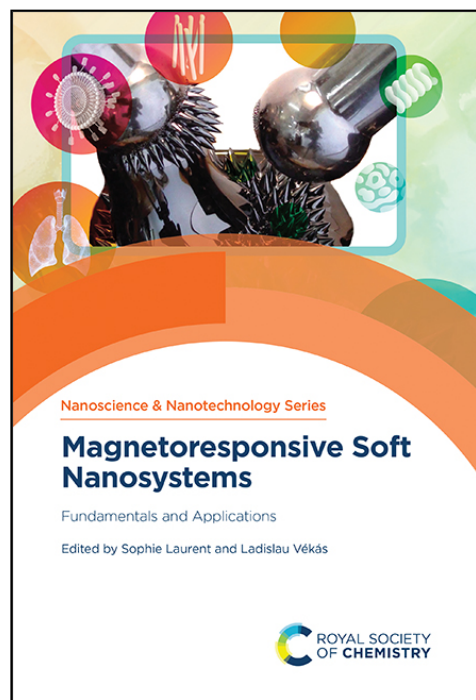
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Magnetoresponsive Soft Nanosystems

Fundamentals and Applications

Sophie Laurent University of Mons, Belgium

Ladislau Vékás Romanian Academy-Timisoara Branch Center for Fundamental and Advanced Technical Research, Romania

Synopsis

This book covers the most recent results in the field of magnetically responsive colloidal nanosystems, with special emphasis on engineering and biocompatible ferrofluids (bio-ferrofluids). It demonstrates the progress in remote controlled nanosystems, particularly in the field of magnetically controllable fluids. Edited by experts in the field, the book is an excellent companion for academics and industry professionals working in magnetic nanoparticles and their applications in soft systems.

Key Features and Highlights

- Explores application-oriented design and synthesis of magnetoresponsive nanosystems, including size-dependent nanoparticle synthesis, multifunctional surface engineering, and colloidal stability in biologically relevant media.
- Presents advanced numerical simulation models alongside cutting-edge magnetic and structural analysis techniques, offering a robust toolkit for researchers.
- Showcases promising and timely applications, highlighting the interdisciplinary impact of magnetic nanomaterials.

Brief Contents

- Iron Oxide Nanoparticles for Magnetic Particle Imaging
- Thermodynamic Structure Formation in Colloidal Dispersions of Single-domain Magnetic Nanoparticles
- Iron Oxide Nanoparticle Systems in Biorelevant Media
- Synthesis, Characterization and Evaluation of Magnetic Nanomaterials in the Recovery of Heavy Metal/Radioactive Soil and Wastewater Contaminants
- Magnetism at the Nanoscale: Implications in Engineering and Biomedical Applications
- Structuring Processes in Magnetic Nanoparticle Systems
- Ferromagnetic Ferrofluids: Ferromagnetic Ordering of Colloidal Magnetic Nanoplatelets
- Magnetic Nano-systems: From Composites to Hybrid Materials
- Ferronematics: Composition, Structure and Properties
- Magnetic Field-responsive Colloidal Assemblies
- Dynamics of Single- and Multi-core Magnetic Nanoparticles in Viscous Media
- Magnetic Labelling of Cells and Microorganisms – Principles and Applications
- Soft Magnetoresponsive Actuators – Engineering and Biomedical Applications
- Optical Deformation and Manipulation of Ferrofluids: Principles, Properties and Applications
- Magnetic Density Separation
- Dynamic Sealing with Magnetisable Fluids – Recent Progress and Applications
- Nano–Micro Composite Magnetorheological Fluids

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THEMA: PNRH, TBN, TGM, TDPM, PDT

BISAC: SCI050000, TEC021000,
TEC023000, TEC027000,
SCI013030

Series: Nanoscience &
Nanotechnology Series
Volume 75

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Chemoenzymatic Synthesis of Natural Products and Complex Small Molecules

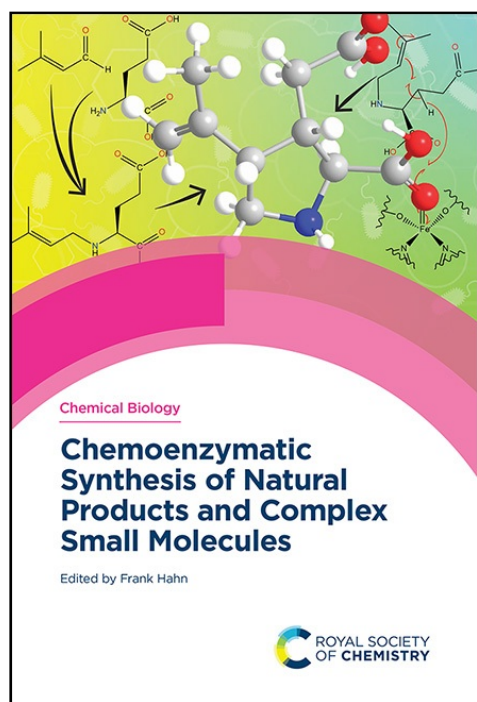
Frank Hahn University of Bayreuth, Germany

Synopsis

Recent developments in biocatalysis have resulted in the application of enzymes for the construction of complex molecules. This dynamically developing field is increasingly becoming a competitive alternative for classical total synthesis. Giving readers an in-depth overview of the current state of the field, this book will be of wide interest to natural products and drug researchers with a chemical or biochemical background and biocatalysis experts in academia and industry.

Brief Contents

- Enzymes in the Synthesis of Natural Products and Other Small Molecules
- The Use of Enzymes Invites a Rethinking of Synthesis: A General Perspective with Special Focus on Enzymatic C–C Couplings
- Chemoenzymatic Synthesis of Terpenoids
- Biocatalytic Production of Nucleotides
- Preparation of Bioactive Compounds via C–N Bond Formation Catalysed by Redox Enzymes
- Biocatalytic Ring Formation in Chemoenzymatic Synthesis
- Side Chain Crosslinking in the Chemoenzymatic Synthesis of NRPS and RiPP Peptide Natural Products
- Biocatalytic Oxidative Dearomatisation
- The Use of Enzymatically-derived *cis*-1,2-Dihydrocatechols as Starting Points in the Chemical Synthesis of
- Natural Products and Other Biologically Active Compounds
- Halogenating Enzymes in Chemoenzymatic Synthesis
- Enzymatic Synthesis of Glycoconjugates
- Recent Advances in Chemoenzymatic Synthesis with Soluble Microbial Prenyltransferases
- Multi-step Enzyme Cascades for the Synthesis of Natural Products and Active Pharmaceutical Ingredients



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Target Audience: College/higher education, Professional and scholarly

Size: 234 x 156 (Royal 8vo) mm

Pages: 490

BIC: PSBZ, PNN

THEMA: PSB, PSE, PNN

BISAC: SCI007000, SCI013040

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Advance Book Information

Biomimetic, Bioinspired and Bioactive Biomaterials for Oral Care

Mary Anne Melo University of Maryland School of Dentistry, USA

Synopsis

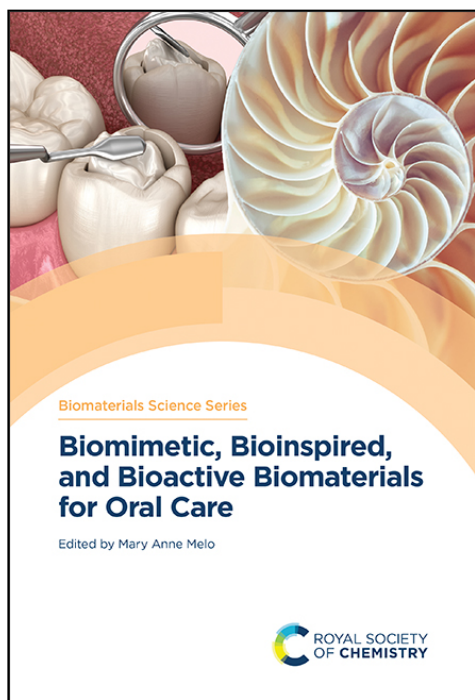
Exploring biomimetic, bioinspired, and bioactive biomaterials in dentistry, the text covers advancements in composites, restorations, tissue engineering and drug delivery. It includes insights from international experts on trends like nanotechnology, 3D printing and personalized dentistry. By bridging science and clinical practice, it equips dental professionals with the knowledge to integrate these materials, improving patient outcomes and advancing dental care.

Key Features and Highlights

- Provides a comprehensive exploration of biomaterials tailored for dental applications, including restorative materials, dental implants, tissue engineering and drug delivery systems.
- Features contributions from internationally renowned experts in the field of dental biomaterials from different countries and affiliations.
- Bridges the gap between scientific knowledge and clinical application by presenting theoretical foundations with practical considerations and real-world applications.

Brief Contents

- Introduction to Biomimetic, Bioinspired, and Bioactive Biomaterials for Oral Care
- Structure and Properties of Hard Dental Tissues
- Biomimetic Dental Ceramics for Prosthetic and Implant Rehabilitation
- Bioinspired Dental Restorative Materials for Antimicrobial Applications
- Bioinspired Approaches for Dental Implants
- Biomaterial Innovations for Dentin Regeneration and Tissue Engineering
- Bioactive Materials for Oral Drug Delivery Systems
- Nanotechnology in Biomimetic and Bioactive Dental Materials
- Integration of Artificial Intelligence in Dental Materials Research and Biomimetic Materials Development



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Target Audience: Professional and scholarly

Audience:

Size: 234 x 156 (Royal 8vo) mm

Pages: 300

BIC: TCB, TGB

THEMA: MKEH, TGML

BISAC: MED016000, SCI013060

Series: Biomaterials Science Series

Volume 22

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