Amphiphilic Polymer Co-networks
Synthesis, Properties, Modelling and Applications
Costas S Patrickios, University of Cyprus, Cyprus

Synopsis
The improved mechanical properties of amphiphilic polymer co-networks (APCNs) are attracting increasing attention from further basic research on the system and also new biomedical and catalysis applications. This new book focuses on the new developments in the field covering the key areas of synthesis, properties, applications and modelling. Edited by a leading name in the field, the book will appeal to graduate students and researchers interested in hydrogels, polymer networks, polymer chemistry, block copolymers, self-assembly and nanomaterials.

Brief Contents
- Thirty years of amphiphilic polymer conetworks
- Poly(N-vinylimidazole)-based amphiphilic polymer conetworks: synthesis and characterization
- Designing biodegradable/biocompatible amphiphilic polymer conetworks for biomedical applications
- Amphiphilic polymer conetworks prepared using degradable initiators
- Block copolymer networks and gels
- Structure and physical properties of model amphiphilic conetwork hydrogels with tetraPEG stars as their hydrophilic component
- Thiolene enabled amphiphilic polymer conetworks from telechelic macromonomers are highly resilient and have wide co-continuous compositional windows

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Catalysis
Volume 32
Yi-Fan Han, East China University of Science and Technology, China
James Spivey, Louisiana State University, USA
Yi-Fan Han, East China University of Science and Technology, China
Dushyant Shekhawat, National Energy Technology Laboratory, USA

Synopsis
Catalysts are required for a variety of applications and researchers are increasingly challenged to find cost effective and environmentally benign catalysts to use. This volume looks at modern approaches to catalysis and reviews the extensive literature including metal-support interactions of Ru-based catalysts under conditions of CO and CO2 hydrogenation, electrocatalytic applications of heteroatom-doped carbon nanostructures and catalytic decomposition of gas-phase benzene.

Brief Contents
- Metal-Support Interactions of Ru-based Catalysts Under Conditions of CO and CO2 Hydrogenation
- Ni Catalysts from Laboratory Investigations to Chemical Industry
- Electrocatalytic Applications of Heteroatom-doped Carbon Nanostructures: Thinking Beyond PEM Fuel Cells
- Catalytic Decomposition of Gas-Phase Benzene: Material Design, Reaction Mechanism and Future Prospect
- Rational Synthesis of Bimetallic Catalysts using Electroless Deposition Methods

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Dendrimer Chemistry
Synthetic Approaches Towards Complex Architectures

Michael Malkoch KTH Royal Institute of Technology, Sweden
Sandra García Gallego University of Alcala, Spain

Synopsis
The dendrimer field continues to grow due to the unique structure of dendrimers that lends itself to useful properties and applications, such as in drug delivery. This book covers the latest advances in the synthesis of dendrimers and other complex dendritic architectures. It provides an overview of the most established building blocks for each family of dendritic material, and highlights the synthetic and structural trends and new applications. This will be a handy reference for postgraduate students and researchers in organic chemistry, polymer chemistry, (nano) materials science and macromolecular chemistry.

Brief Contents
- Bis-MPA Dendrimers and Other Dendritic Polyesters Poly(Glycerol)
- Dendrimers and Other Poly(ether) Dendrimers
- Poly(lysine) Dendrimers and Other Dendritic Molecules from Naturally Occurring Monomers
- PAMAM Dendrimers and Other Poly(amide) Dendrimers Poly(carbosilane)
- Dendrimers and Other Silicon-containing Dendrimers
- Poly(phosphorhydrazone) Dendrimers and Other Phosphorous-containing Dendrimers
- Polyphenylene Dendrimers: Advances In Synthesis and Evolution of Properties
Advance Book Information

Challenges in Green Analytical Chemistry
Bicontinuous Particle-stabilized Emulsions
Salvador Garrigues, University of Valencia, Spain
Miguel de la Guardia, University of Valencia, Spain

Synopsis
The past decade has seen significant developments in improving the greenness of analytical chemistry, including the use of new smart materials as analytical tools. Solvent selection, miniaturization and metrics for the evaluation of method greenness make this book useful for researchers and industry, interested in integrating safer and sustainable analytical techniques into their work. The fact that, in general, green methods of analysis offer cheaper alternatives to traditional ones, adds an economical interest to this approach.

Past, present and future of green analytical chemistry

Brief Contents

- Direct analysis by green spectroscopy
- Sensors as green tools
- Innocuous and less hazardous reagents
- Greener sample preparation extraction
- Automation through flow analysis
- New advancements in green electroanalysis
- Green solvents for analyte extraction
- Green chromatography: state of the art, opportunities
- and future perspectives
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London Dispersion Forces in Molecules, Solids and Nano-structures

An Introduction to Physical Models and Computational Methods

Janos Angyan, University of Lorraine, France
John Dobson, Griffith University, Australia
Georg Jansen, University of Duisburg-Essen, Germany
Tim Gould Griffith, University, Australia

Synopsis
Summarising current understanding of the physical origin and modelling of London dispersion forces manifested at an atomic level, this book provides theoretical, physical and synthetic chemists, as well as solid-state physicists, with a systematic understanding of the origins and consequences of these ubiquitous interactions. It covers a wide range of system, from small intermolecular complexes, to organic molecules and crystalline solids, through to biological macromolecules and nanostructures.

Brief Contents
- General and Historical Aspects
- Simple Models of London Dispersion Forces
- Perturbation Theory Treatment
- Quantum Chemical Methods
- DFT
- ACFDT: RPA and Related Methods
- Semi-Empirical Models
- Molecular Complexes
- Macromolecules and Nanostructures
- Chemical Effects of Dispersion Interactions

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The Chemical Biology of Sulfur

Christopher T Walsh, Stanford University, USA

Synopsis

This volume aims to provide an in-depth view of the complete biochemistry of sulfur with an emphasis on aspects not covered elsewhere. Given its role in the formation of proteins and presence in the amino acids methionine and cysteine, sulfur is essential to life. Current literature on the biochemistry of sulfur is vast and widely dispersed, as such this volume is intended as a single-source for everything concerning sulfur biochemistry from metabolic roles of inorganic sulfur, to thiol and thioether chemical biology, to the university of cysteine chemistry in proteomes. Authored by a renowned biochemist and experienced writer and educator, this book is ideal for students and researchers in biochemistry, biology and the life sciences with an interest in sulfur and its role in life.

Introduction to Sulfur Chemical Biology

Brief Contents

- Sulfate Reducing Bacteria
- Sulfide Oxidizing Bacteria
- Organosulfur Metabolites in Biologic Systems
- The Nucleophilic Thiolate in Cysteine and Cysteamine Scaffolds
- Protein Cysteine Persulfides and Fe-S Clusters: Intersection of Organic and Inorganic Sulfur Biochemistry
- Cysteine to Taurine: Thiol to Sulfonic Acid
- Methionine: Thioether Biological Chemistry
- One Electron vs Two Electron Reaction Manifolds in Sulfur Enzymology
- Sulfuryl Transferases/Sulfatases; C-S Bond Formations in Primary and Secondary
Sticking Together
The Science of Adhesion
Steven Abbott, University of Leeds, UK

Synopsis
This popular science title will cover adhesion science in an easily accessible entertaining manner. As well as outlining types of adhesion and their importance in everyday life, the book covers interesting future applications of adhesion and inspiration taken from nature. Ideal for students and the scientifically minded reader this book provides a fascinating introduction to the science of what makes things stick.

Brief Contents
- Background Ideas
- Sticking like a Gecko
- How Stuck is Stuck?
- Strong Adhesion
- Strong Adhesion with Weak Polymers
- Sticking Other Things Together
- Watching Paint Dry
- Sticking in 3D
- Not Sticking
- How Nature Sticks Things

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