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Theory, Modelling and Applications
Cucurbituril-based Functional Materials
Aspects of Organic and Inorganic Supramolecular Chemistry
Modern Cyclophane Chemistry
Design of Macrocyclic Compounds for Biomedical Applications
Supramolecular Protein Chemistry
Polyrotaxane and Slide-Ring Materials

HAYNES SANTANA

Supramolecular Systems in Biomedical Fields Walter de Gruyter GmbH & Co KG
Assembly, Architecture and Application
RNA Nanotechnology Royal Society of Chemistry
This is the most updated, comprehensive collection of monographs on all aspects of photochemistry and photophysics related to natural and synthetic, inorganic, organic, and biological supramolecular systems. Supramolecular Photochemistry: Controlling Photochemical Processes addresses reactions in crystals, organized assemblies, monolayers, zeolites, clays, silica, micelles, polymers, dendrimers, organic hosts, supramolecular structures, organic glass, proteins and DNA, and applications of photosystems in confined media. This landmark publication describes the past, present, and future of this growing interdisciplinary area.
Biological Inorganic Chemistry John Wiley & Sons
Part A.: Overviews of biological inorganic chemistry : 1. Bioinorganic chemistry and the biogeochemical cycles -- 2. Metal ions and proteins: binding, stability, and folding -- 3. Special cofactors and metal clusters -- 4. Transport and storage of metal ions in biology -- 5. Biominerals and biomineralization -- 6. Metals in medicine. -- Part B.: Metal ion containing biological systems : 1. Metal ion transport and storage -- 2. Hydrolytic chemistry -- 3. Electron transfer, respiration, and photosynthesis -- 4. Oxygen metabolism -- 5. Hydrogen, carbon, and sulfur metabolism -- 6. Metalloenzymes with radical intermediates -- 7. Metal ion receptors and signaling. -- Cell biology, biochemistry, and evolution: Tutorial I. -- Fundamentals of coordination chemistry: Tutorial II.
Nitroxides John Wiley & Sons
Fundamentals of Supramolecular Chirality is a critical description of the start and advancement of supramolecular chirality. This book focuses on the noncovalent approach with some supplementary examples of covalent supramolecular chirality.This contribution to supramolecular chirality is not intended to be a mere catalogue and description of the work done. It also traces a philosophical path following the development and possible perspectives of this topic, providing not a review but a critical examination of the field.
Supramolecular Chemistry Walter de Gruyter GmbH & Co KG

Summarizing all the latest trends and recent topics in one handy volume, this book covers everything needed for a solid understanding of photochromic materials. Following a general introduction to organic photochromic materials, the authors move on to discuss not only the underlying theory but also the properties of such materials. After a selection of pplications, they look at the latest achievements in traditional solution-phase applications, including photochromic-based molecular logic operations and memory, optically modulated supramolecular system and sensors, as well as light-tunable chemical reactions. The book then describes the hotspot areas of photo-switchable surfaces and nanomaterials, photochromic-based luminescence/electronic devices and bulk materials together with light-regulated biological and bio-chemical systems. The authors conclude with a focus on current industrial applications and the future outlook for these materials. Written with both senior researchers and entrants to the field in mind.

From Concepts to Applications Royal Society of Chemistry

This title combines classical host: guest chemistry with catalysis, reactivity and modern supramolecular chemistry

Cucurbiturils John Wiley & Sons

Connects fundamental knowledge of multivalent interactions with current practice and state-of-the-art applications Multivalency is a widespread phenomenon, with applications spanning supramolecular chemistry, materials chemistry, pharmaceutical chemistry and biochemistry. This advanced textbook provides students and junior scientists with an excellent introduction to the fundamentals of multivalent interactions, whilst expanding the knowledge of experienced researchers in the field. Multivalency: Concepts, Research & Applications is divided into three parts. Part one provides background knowledge on various aspects of multivalency and cooperativity and presents practical methods for their study. Fundamental aspects such as thermodynamics, kinetics and the principle of effective molarity are described, and characterisation methods, experimental methodologies and data treatment methods are also discussed. Parts two and three provide an overview of current systems in which multivalency plays an important role in chemistry and biology, with a focus on the design rules, underlying chemistry and the fundamental principles of multivalency. The systems covered range from chemical/materials-based ones such as dendrimers and sensors, to biological systems including cell recognition and protein binding. Examples and case studies from biochemistry/bioorganic chemistry as well as synthetic systems feature throughout the book. Introduces students and young scientists to the field of multivalent interactions and assists experienced researchers utilising the methodologies in their work Features examples and case studies from biochemistry/bioorganic chemistry, as well as synthetic systems throughout the book Edited by leading experts in the field with contributions from established scientists Multivalency: Concepts, Research & Applications is recommended for graduate students and junior scientists in supramolecular chemistry and related fields, looking for an introduction to multivalent interactions. It is also highly useful to experienced academics and scientists in industry working on research relating to multivalent and cooperative systems in supramolecular chemistry, organic chemistry, pharmaceutical chemistry, chemical biology, biochemistry, materials science and nanotechnology.

Photochromic Materials World Scientific

Provides deep insight into the concepts and recent developments in the area of supramolecular chemistry in water Written by experts in their respective field, this comprehensive reference covers various aspects of supramolecular chemistry in water?from fundamental aspects to applications. It provides readers with a basic introduction to the current understanding of the properties of water and how they influence molecular recognition, and examines the different receptor types available in water and the types of substrates that can be bound. It also looks at areas to where they can be applied, such as materials, optical sensing, medicinal imaging, and catalysis. Supramolecular Chemistry in Water offers five major sections that address important topics like water properties, molecular recognition, association and aggregation phenomena, optical detection and imaging, and supramolecular catalysis. It covers chemistry and physical chemistry of water; water-mediated molecular recognition; peptide and protein receptors; nucleotide receptors; carbohydrate receptors; and ion receptors. The book also teaches readers all about coordination compounds; self-assembled polymers and gels; foldamers; vesicles and micelles; and surface-modified nanoparticles. In addition, it provides in-depth information on indicators and optical probes, as well as probes for medical imaging. -Covers, in a timely manner, an emerging area in chemistry that is growing more important every day - Addresses topics such as molecular recognition, aggregation, catalysis, and more -Offers comprehensive coverage of everything from fundamental aspects of supramolecular chemistry in water to its applications -Edited by one of the leading international scientists in the field Supramolecular Chemistry in Water is a one-stop-resource for all polymer chemists, catalytic chemists, biochemists, water chemists, and physical chemists involved in this growing area of research.

Analytical Chemistry Editor's Pick 2021 Royal Society of Chemistry

Supramolecular chemistry is 'chemistry beyond the molecule' - the chemistry of molecular assemblies and intermolecular bonds. It is one of today's fastest growing disciplines, crossing a range of subjects from biological chemistry to materials science; and from synthesis to spectroscopy. Supramolecular Chemistry is an up-to-date, integrated textbook that tells the newcomer to the field everything they need to know to get started. Assuming little in the way of prior knowledge, the book covers the concepts behind the subject, its breadth, applications and the latest contemporary thinking in the area. It also includes coverage of the more important experimental and instrumental techniques needed by supramolecular chemists. The book has been thoroughly updated for this second edition. In addition to the strengths of the very popular first edition, this comprehensive new version expands coverage into a broad range of emerging areas. Clear explanations of both fundamental and nascent concepts are supplemented by up-to-date coverage of exciting emerging trends in the literature. Numerous examples and problems are included throughout the book. A system of "key references" allows rapid access to the secondary literature, and of course comprehensive primary literature citations are provided. A selection of the topics covered is listed below. Cation, anion, ion-pair and molecular host-guest chemistry Crystal engineering Topological entanglement Clathrates Self-assembly Molecular devices Dendrimers Supramolecular polymers Microfabrication Nanoparticles Chemical emergence Metal-organic frameworks Gels Ionic liquids Supramolecular catalysis Molecular electronics Polymorphism Gas sorption Anion-pinteractions Nanochemistry Supramolecular Chemistry is a must for both students new to the field and for experienced researchers wanting to explore the origins and wider context of their work. Review: "At just under 1000 pages, the second edition of Steed and Atwood's Supramolecular Chemistry is the most comprehensive overview of the area available in textbook form...highly recommended." —Chemistry World, August 2009

Synthesis, Properties and Applications Springer

Synthetic receptor molecules, molecules that mimic antibody recognition, are widely used for developing drug leads; drug delivery vehicles; imaging agents; sensing agents; capture agents and separation systems. Synthetic Receptors for Biomolecules covers the most effective synthetic receptors for each major class of biomolecules within the context of specific applications. The book starts with an introduction to the applications of synthetic receptors for biomolecules and their design and synthesis for biomolecule recognition. Dedicated chapters then cover synthetic receptors for the key biomolecules including inorganic cations; small organic and inorganic anions; carbohydrates; nucleosides/nucleotides; oligonucleotides; amino acids and peptides; protein surfaces as well as non-polar and polar lipids; Each chapter follows the same systematic format of (a) chemical structures and physical properties of the biomolecule, (b) biological recognition of the biomolecule, (c) synthetic receptors for the biomolecule, (d) future directions and challenges. Edited by a leader in the field, the book is written in an accessible style for readers new to supramolecular chemistry or for those looking for synthetic receptors.

A Practical Guide John Wiley & Sons

This book chronicles the history and development of cucurbiturils. It provides a general introduction and a field-wide overview of the synthesis, properties and applications of cucurbiturils. Beginning with a chronicled history in the development of the once little-known peculiarity to the forefront of supramolecular chemistry, followed by an in depth look at the preparation, properties and host-guest chemistry, the title showcases the uses of cucurbiturils in chemistry, materials science and biology. An essential resource for both new and experienced researchers, as it provides an overview of the diverse applications, new methodologies and research, as well as challenges in the field.

Fundamentals Of Supramolecular Chirality Frontiers Media SA

Supramolecular chemistry, "the chemistry beyond the molecule", is a fascinating realm of modern science. The design of novel supramolecular structures, surfaces, and techniques are at the forefront of research in different application areas, including corrosion and biofouling protection. A team of international experts provide a comprehensive view of the applications and potential of supramolecular chemistry in corrosion and biofouling prevention. Chapter topics include types and fundamentals of supramolecules, supramolecular polymers and gels, host-guest inclusion compounds, organic-inorganic hybrid materials, metallo-assemblies, cyclodextrins, crown ethers, mesoporous silica and supramolecular structures of graphene and other advances. Additional Features include: Focuses on different aspects of supramolecular chemistry in corrosion and biofouling prevention. Comprehensively covers supramolecular interactions that can provide better corrosion and biofouling protection. Provides the latest developments in self-healing coatings. Explores recent research advancements in the suggested area. Includes case studies specific to industries. The different supramolecular approaches being investigated to control corrosion and biofouling are gathered in one well-organized reference to serve senior undergraduate and graduate students, research students, engineers, and researchers in the fields of corrosion science & engineering, biofouling, and protective coatings.

Supramolecular Amphiphiles CUP Archive

This handbook presents recent advances and offers a comprehensive reference resource covering the developments in and applications of macrocyclic supramolecular assembly, with a focus on their construction, structural characters and biological functions. The main topics addressed include: Construction and structure of macrocyclic supramolecular assembly – key building blocks, construction methods, structural motifs, and stimuli responsive control Approach and technology – controllable synthesis, molecular recognition, spectral and thermodynamic study, supramolecular assembly at interfaces, orthogonal self-assembly, the supramolecular organic framwork (SOF), molecular induced aggregation, supramolecule assisted 3D printing, theoretical calculation and molecular simulation Biological applications – chemical and biological sensing, theranostic tools, molecule/ion channels, drug/gene delivery, supramolecule assisted biomolecule production, supramolecule assisted transmembrane transport, supramolecule assisted immunity regulation, supramolecule-based medicinal drug, etc. This handbook appeals to graduate and undergraduate students as well as scientists with interests in supramolecular chemistry, biochemistry, functional material and nanotechnology.

Concepts, Research and Applications World Scientific

An introduction to the mechanical bond -- The fundamentals of making mechanical bonds -- Making mechanical bonds under thermodynamic control -- Molecular topologies and architectures with mechanical bonds -- The stereochemistry of the mechanical bond -- Molecular switches and machines with mechanical bonds

Supramolecular Chemistry in Corrosion and Biofouling Protection Royal Society of Chemistry

Here, the editors Rolf Gleiter and Henning Hopf present an excellent overview of all the important aspects and latest results in cyclophane chemistry. Clearly structured and covering the entire range, the book introduces readers to the most recent research in the field. Twenty chapters, written by well-known scientists, cover in particular: - synthesis of carbo- and heterocyclic cyclophanes and metallocenophanes, - structural and spectroscopic properties of cyclophanes, - current and future applications in synthesis and material science, - novel reactions of cyclophanes, - use of cyclophanes as building blocks in supramolecular chemistry for this fascinating class of compounds. Thus, this is not only an extremely valuable source of information for synthetic organic chemists, but also a ready reference for scientists working in related fields of arene chemistry, stereoselective synthesis, material science, and bioorganic chemistry.

From Molecules to Machines John Wiley & Sons

Cucurbiturils and Related MacrocyclesRoyal Society of Chemistry

Applications in Materials and Organic Electronics Royal Society of Chemistry

Comprehensive Supramolecular Chemistry II, Second Edition is a ‘one-stop shop’ that covers supramolecular chemistry, a field that originated from the work of researchers in organic, inorganic and physical chemistry, with some biological influence. The original edition was structured to reflect, in part, the origin of the field. However, in the past two decades, the field has changed a great deal as reflected in this new work that covers the general principles of supramolecular chemistry and molecular recognition, experimental and computational methods in supramolecular chemistry, supramolecular receptors, dynamic supramolecular chemistry, supramolecular engineering, crystallographic (engineered) assemblies, sensors, imaging agents, devices and the latest in nanotechnology. Each section begins with an introduction by an expert in the field, who offers an initial perspective on the development of the field. Each article begins with outlining basic concepts before moving on to more advanced material. Contains content that begins with the basics before moving on to more complex concepts, making it suitable for advanced undergraduates as well as academic researchers Focuses on application of the theory in practice, with particular focus on areas that have gained increasing importance in the 21st century, including nanomedicine, nanotechnology and

medicinal chemistry Fully rewritten to make a completely up-to-date reference work that covers all the major advances that have taken place since the First Edition published in 1996

Supramolecular Soft Matter Elsevier

This textbook addresses the chemical and physicochemical principles of supramolecular host-guest chemistry in solution. It covers the thermodynamics and dynamics of inclusion and highlights several types of organic hosts. Various applications of host-guest chemistry in analytical and environmental chemistry as well as pharmaceutical and chemical industry demonstrate the versatile usability of molecular cages.

The Nature of the Mechanical Bond Frontiers Media SA

This book is an excellent introduction to supramolecular chemistry, explaining how molecules can be arranged to more complex chemical systems through non-covalent interactions and what makes supramolecular architectures stable. Starting with the principles of molecular recognition and supramolecular receptors, the author further gives an overview of different supramolecular systems and methods for their synthesis.

Synthetic Receptors for Biomolecules Cucurbiturils and Related Macrocycles

Non-covalent interactions, which are the heart of supramolecular chemistry are also the basis of most important functions of living systems. The ability to apply supramolecular chemistry principles to the life sciences, such as designing synthetic host compounds to selectively interact within biological targets, has gained wide appeal due the vast number of potential applications. Supramolecular Systems for Biomedical Fields provides in sixteen chapters a comprehensive overview of these applications. Each chapter covers a specific topic and is written by internationally renowned experts in that area. Sensing of bioactive inorganic ions and organic substrates is the focus of several contributions, as well as interactions with proteins and nucleic acids. Specific chapters are devoted to cyclodextrins, calixarenes and cucurbiturils as most frequently used receptors, including applications such as drug delivery and protection, gene transfer and others. Other chapters address the use of combinatorial libraries, molecular imprinting techniques, enzyme assays, supramolecular gels, bioimaging, drug activation, photodynamic therapy, and antitumour metal complexes. This timely publication will appeal to graduate students and researchers from chemical, pharmaceutical, biological, and medicinal fields interested in the supramolecular chemistry of biological systems and their practical potentials.