

Supramolecular Chemistry

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Supramolecular Chemistry in Biomedical Imaging Stephen Faulkner 2022-04-01 There have been many great advances in the field of biomedical imaging in recent years, with supramolecular chemistry playing a key role in the evolution of modern imaging techniques. Non-covalent supramolecular interactions are fundamental to countless biological processes, from host-guest binding to the stabilisation of complex structures. Supramolecular chemistry techniques can be employed to create probes that can be targeted to either exploit or disrupt these interactions, giving the potential for both diagnostic and therapeutic effects. Furthermore, in techniques such as contrast enhanced MRI, controlling the interactions between solvent molecules and the imaging agent is crucial to the development of the technique. With rapid growth in the synthesis and study of molecular imaging agents, the understanding of their associated techniques has sometimes lagged behind. *Supramolecular Chemistry in Biomedical Imaging* will fill this gap by clarifying the state of current understanding and the nature of the underlying problems inherent to addressing problems in biology. It will cover both the techniques used in imaging and the molecular and supramolecular systems used to exploit them. This publication targets academics coming to the field from mainstream supramolecular chemistry, research graduates and undergraduates interested in supramolecular chemistry, synthesis or imaging agents and imaging techniques for biomedical applications.

Encyclopedia of Supramolecular Chemistry J. L. Atwood 2004 Crystallizing a rapidly expanding interdisciplinary field and one of the most popular and newsworthy areas in contemporary chemistry, this two-volume encyclopaedia offers authoritative information with user-friendly and high-quality articles.

Introduction Supramolecular Chemistry D. A. S. A 2017

Comprehensive Supramolecular Chemistry: Supramolecular reactivity and transport : bioinorganic systems Multiple Contributors 1996-07-16 *Comprehensive Supramolecular Chemistry* covers for the first time in eleven detailed volumes the exciting inter- and multidisciplinary area of modern supramolecular chemistry. This subject, which has now reached an astonishing diversity and complexity, has developed at a remarkably rapid pace following the initial discoveries of crown ethers and cryptands in the late sixties. The numerous references, including many recent citations, constitute an unrivalled in-depth source for direct entry to the widespread primary literature on any aspect of this

most highly topical area. The many carefully selected illustrations and instructive schematic representations make the chapters easily readable.

Functional Supramolecular Materials Rahul Banerjee 2017-05-05 Supramolecular materials have a great number of applications due to the reversibility of their non-covalent molecular interactions, such as reversible hydrogen bonding, host-guest interactions and electrostatic interactions. This book provides a comprehensive source of information on the structure and function of organic and metal-organic supramolecular materials. The chapters of this book provide an overview of supramolecular material assembly at various scales, including the formation of 2D polymers and molecular cages. The role of intermolecular interactions in solid and solution state self-assembly is discussed, as is the role of mechanochemistry on molecular and supramolecular architectures. Finally, novel applications of these materials in molecular recognition, catalysis, light harvesting and environmental remediation are covered. *Functional Supramolecular Materials* will be of interest to graduate students and researchers in academia and industry in the fields of supramolecular chemistry and functional materials science.

Supramolecular Organometallic Chemistry Ionel Haiduc 2008-11-21 Supramolecular chemistry has become not only a major field of chemistry, but is also a vivid interface between chemistry, biology, physics, and materials science. Although still a relatively young field, termini such as molecular recognition, host-guest chemistry, or self-assembly are now common knowledge even for chemistry students, and research has already been honored with a Nobel Prize. This first book on supramolecular organometallic chemistry combines two areas in chemistry that are experiencing the fastest developments. It provides a comprehensive review of various organometallic assemblies, arranged according to the types of intermolecular bonding. Details on the synthesis, structures, and properties of these compounds will be a valuable asset to the scientific community. The broad spectrum of assemblies containing main group element, transition metal, or f-element metal and a diverse range of ligands, held together by different bonding interactions make this a fascinating compilation. Illustrated extensively, this book is a very easily accessible, yet wide-ranging source of information.

NMR in Supramolecular Chemistry M. Pons 2012-12-06 NMR is better suited than any other experimental technique for the characterization of supramolecular systems in solution. The presentations included here can be broadly divided into three classes. The first class illustrates the state of the art in the design of supramolecular systems and includes examples of different classes of supramolecular complexes: catenanes, rotaxanes, hydrogen-bonded rosettes, tubes, capsules, dendrimers, and metal-containing hosts. The second class comprises contributions to NMR methods that can be applied to address the main structural problems that arise in supramolecular chemistry. The third class includes biological supramolecular systems studied by state-of-the-art NMR techniques.

Supramolecular Chemistry Jean-Marie Lehn 1995

Introduction to Supramolecular Chemistry Helena Dodziuk 2007-05-08 A new rapidly progressing field on the crossroads among chemistry, biochemistry, physics and technology - supramolecular chemistry - has just emerged. You have to be involved, to know what's going on in this domain and to take part in the development. This book will show you in a condensed form exciting phenomena unthinkable within the realm of classical organic chemistry (for example, alkali metal anions or cyclobutadiene stable for month at room temperature) that not only provide the basis for revolutionizing numerous branches of industry but also improve our understanding of the functioning of living organisms and of the origin of life. Designing supramolecular systems with desired properties will among others make chemical

industry cleaner and more safe, electronics smaller by developing devices composed of single molecule or molecular aggregate. It will also entirely change the way we use energy resources. In addition, it will also transform the pharmaceutical industry and medicine by developing new ways of drugs administration and new composite biocompatible materials which will serve as implants of new generation changing dentistry, surgery, and other branches of medicine. You cannot afford to stand apart. With its brief but comprehensive and vivid presentation including the latest development, Introduction to Supramolecular Chemistry is the best method to get into this domain. This book provides an excellent summary of information scattered across the literature. The brief but comprehensive coverage of the whole field including practically all important group of compounds forming aggregates (in particular crown ethers, cavitands, fullerenes, cyclodextrins and their complexes) provisioning full references for the discussed subjects make this book of value not only for Ph.D. students and non-specialists in this domain but also for those working in the field. The book has been found to be a particularly useful resource for students and more generally for those wanting to get the up-to-date concise account of this exciting field.

Supramolecular Chemistry - Fundamentals and Applications Katsuhiko Ariga 2006-08-02 The fundamentals of "supramolecular chemistry" to the latest developments on the subject are covered by this book. It sets out to explain the topic in a relatively easy way. The basic concepts of molecular recognition chemistry are included. Molecules with fascinating shapes and functions such as fullerenes, carbon nanotubes, dendrimers, rotaxane, and catenane, and molecular assemblies are also explained. Thereafter applications of supermolecules to nanotechnology are introduced with many examples of molecular devices. The last part of the book describes biological supermolecules and their mimics. Though simply explained undergraduate and graduate students in Chemistry will be able to use aspects of this work as an advanced textbook.

A Practical Guide to Supramolecular Chemistry Peter J. Cragg 2005-11-04 A Practical Guide to Supramolecular Chemistry is an introductory manual of practical experiments for chemists with little or no prior experience of supramolecular chemistry. Syntheses are clearly presented to facilitate the preparation of acyclic and macrocyclic compounds frequently encountered in supramolecular chemistry using straightforward experimental procedures. Many of the compounds can be used to illustrate classic supramolecular phenomena, for which clear directions are given, or may be developed further as part of the reader's own research. The book also describes techniques commonly used in the analysis of supramolecular behaviour, including computational methods, with many detailed examples. An invaluable reference for students and researchers in the field embarking on supramolecular chemistry projects and looking for a 'tried and tested' route into the chemistry of key compounds. An introductory guide to practical syntheses focusing on supramolecular chemistry. Fully referenced introductions explain the historical and contemporary importance of each compound Supplementary website including 3D molecular structures, FAQ's about syntheses and suggestions for further experiments

Supramolecular Chemistry at Surfaces David B. Amabilino 2016-04-26 Supramolecular chemistry provides a versatile approach for modifying the structure and function of surfaces, including the formation of clusters, monolayers and films. This can be used in a variety of applications from porous surface systems, to modifiers of interface energy and sensor-based systems. Supramolecular Chemistry at Surfaces covers different methods of preparing and studying self-assembled structures at surfaces and interfaces. The book starts with a general introduction concerning the nature of surfaces followed by specific sections discussing different techniques to characterise surface-based supramolecular systems. Each chapter then goes on to address different surface systems including the surface of water; physisorbed layers at interfaces; chemisorbed layers at interfaces; polyelectrolyte systems; thin films;

dynamic systems; and patterning. Written by a leading expert in the field, this is the first book to give a multidisciplinary view of the supramolecular aspects of interfaces providing the reader with an objective summary of all the deposition methods and their characterisation. The book will appeal to students and researchers in supramolecular chemistry, nanoscience, polymer chemistry and physics, surface science and materials science.

Giant Vesicles Pier Luigi Luisi 2008-04-30 Perspectives in Supramolecular Chemistry Founded by J.-M. Lehn Perspectives in Supramolecular Chemistry reflects research which develops supramolecular structures with specific new properties, such as recognition, transport and simulation of biosystems or new materials. The series covers all areas from theoretical and modelling aspects through organic and inorganic chemistry and biochemistry to materials, solid-state and polymer sciences reflecting the many and varied applications of supramolecular structures in modern chemistry. Giant Vesicles Edited by Pier Luigi Luisi and Peter Walde Institute für Polymere, ETH-Zürich, Switzerland Giant vesicles or giant liposomes are supramolecular assemblies of amphiphiles, surface active substances which normally contain one or two hydrophobic chains and one hydrophilic head. Due to their relatively large size, giant vesicles are easily observed by light microscopy. This volume provides an overview of ideas and results obtained from experimental studies as well as theoretical approaches. A wide variety of aspects ranging from pure mathematics and physical considerations to biochemical and biological applications are covered. Historical and fundamental aspects are discussed as well as a range of experimental approaches including the micromanipulation and micro-puncturing of single giant vesicles. 87 international contributors comment on a wide range of issues contained under the five main part headings: Introduction Preparation Methods Basic Theoretical Aspects Physical Properties Chemical and Biological Aspects. Giant Vesicles has been written for researchers in the fields of chemistry, biochemistry and biophysics, working in supra-molecular chemistry, surfactant science, liposome and pharmaceutical sciences.

Comprehensive Supramolecular Chemistry II George W. Gokel 2017-06-22 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

Core Concepts in Supramolecular Chemistry and Nanochemistry Jonathan W. Steed 2007-04-30 Supramolecular chemistry and nanochemistry are two strongly interrelated cutting edge frontiers in research in the chemical sciences. The results of recent work in the area are now an increasing part of modern degree courses and hugely important to researchers. Core Concepts in Supramolecular

Chemistry and Nanochemistry clearly outlines the fundamentals that underlie supramolecular chemistry and nanochemistry and takes an umbrella view of the whole area. This concise textbook traces the fascinating modern practice of the chemistry of the non-covalent bond from its fundamental origins through to its expression in the emergence of nanochemistry. Fusing synthetic materials and supramolecular chemistry with crystal engineering and the emerging principles of nanotechnology, the book is an ideal introduction to current chemical thought for researchers and a superb resource for students entering these exciting areas for the first time. The book builds from first principles rather than adopting a review style and includes key references to guide the reader through influential work. supplementary website featuring powerpoint slides of the figures in the book further references in each chapter builds from first principles rather than adopting a review style includes chapter on nanochemistry clear diagrams to highlight basic principles

NMR in Supramolecular Chemistry Miquel Pons 1999-03-31 NMR is better suited than any other experimental technique for the characterization of supramolecular systems in solution. The presentations included here can be broadly divided into three classes. The first class illustrates the state of the art in the design of supramolecular systems and includes examples of different classes of supramolecular complexes: catenanes, rotaxanes, hydrogen-bonded rosettes, tubes, capsules, dendrimers, and metal-containing hosts. The second class comprises contributions to NMR methods that can be applied to address the main structural problems that arise in supramolecular chemistry. The third class includes biological supramolecular systems studied by state-of-the-art NMR techniques.

Supramolecular Chemistry I — Directed Synthesis and Molecular Recognition Edwin Weber 2013-10-03
1. F.H. Kohnke, J. Mathias, J.F. Stoddart: Substrate-Directed Synthesis: The Rapid Assembly of Novel Macropolycyclic Structures via Stereoregular Diels-Alder Oligomerizations
2. S.C. Zimmerman: Rigid Molecular Tweezers as Hosts for the Complexation of Neutral Guests
3. A. Collet, J.-P. Dutasta, B. Lozach, J. Canceill: Cyclotrimeratrylenes and Cryptophanes: Their Synthesis and Applications to Host-Guest Chemistry and to the Design of New Materials
4. J.-C. Chambron, Ch.D. Dietrich-Buchecker, S. Misumi: From Classical Chirality to Topologically Chiral Catenands and Knots
5. S. Misumi: Recognitory Coloration of Cations with Chromoacerands
6. D.A. Tomalia, H.D. Durst: Genealogically Directed Synthesis: Starburst/Cascade Dendrimers and Hyperbranched Structures

Applications of Supramolecular Chemistry Hans-jrg Schneider 2016-10 Applications of Supramolecular Chemistry introduces the use of non-covalent interactions and molecular recognition for many fields. Applications include the analysis of technically, medically, and environmentally important chemical compounds, their separation, purification and removal, and the design of new materials, including supramolecular electronics. The book also explores biological interactions and applications in the food and textile industries.

Supramolecular Chemistry Jonathan W. Steed 2022-03-01 A one-stop, comprehensive, and thoroughly updated resource for students, professors, and researchers alike Thoroughly revised and updated, the Third Edition of Supramolecular Chemistry delivers a comprehensive and integrated approach to this rapidly evolving and quickly expanding field. Distinguished professors and authors Jonathan Steed and Jerry Atwood provide readers with a broad and exhaustive resource that assumes little in the way of prior knowledge of supramolecular chemistry. Extensive new content on cutting edge research throughout the field including molecular machines and the mechanical bond, mechanochemistry, halogen bonding, and crystal nucleation accompanies full-color imagery and study problems designed to help students understand and apply the principles introduced within the book. Additional material is provided in the supplementary online resources, including solutions to the student exercises and

PowerPoint slides of the figures in the book. *Supramolecular Chemistry, Third Edition* also includes: The latest research and developments reported over the last decade A unique “key references” system that highlights crucial reviews and primary literature A description of key experimental techniques included in accessible “boxes” for the non-expert Exercises and problems for students, complete with online solutions Full-color illustrations and imagery designed to facilitate learning and retention of the key concepts and state-of-the art of the field Perfect for undergraduate and postgraduate students taking courses on supramolecular chemistry, the Third Edition of *Supramolecular Chemistry* also belongs on the bookshelves of all researchers in this, and any closely related, fields. Academics, in particular postdoctoral students and professors, will benefit significantly from this text.

Supramolecular Chemistry Peter J. Cragg 2010-08-26 The aim of this book is to return to the biomimicry and medicinal potential that inspired many of the early supramolecular chemists and to set it in the context of current advances in the field. Following an overview of supramolecular chemistry, the first section considers the efforts made to synthesize artificial systems that mimic biological entities. The second section addresses the application of supramolecular principles to molecular diagnostics with a particular emphasis on the ‘receptor-relayreporter’ motif. Many of the examples chosen have clinical importance. The third section takes the clinical diagnostic theme further and demonstrates the therapeutic applications of supramolecular chemistry through photodynamic therapy, drug delivery, and the potential for synthetic peptides to form antibiotic tubes. The short epilogue considers the potential for supramolecular solutions to be found for further challenges in biomimetic and therapeutic chemistry.

Supramolecular Chemistry 2018-02-13 *Supramolecular Chemistry, Volume 71*, the latest release in the *Advances in Inorganic Chemistry* series presents timely and informative summaries on the current progress in a variety of subject areas within inorganic chemistry, ranging from bio-inorganic to solid state studies. This acclaimed serial features reviews written by experts in the field, serving as an indispensable reference to advanced researchers. In this volume, concise, authoritative reviews provide an up-to-date resource material for new investigators and established research personnel. Included references enable readers to pursue detail and development in each field. In addition, research chemists in other fields can use this serial to acquaint themselves with the latest experimental methods, techniques and computational applications within the field of inorganic reaction mechanisms. Features comprehensive reviews on the latest developments in supramolecular (complex) chemistry Includes contributions from leading experts in the field of supermolecules and related materials Serves as an indispensable reference to advanced researchers in supramolecular chemistry

Synergy in Supramolecular Chemistry Taylor & Francis Group 2021-12-13 Cooperative and synergistic chemical events have attracted significant attention from many researchers engaged in organic chemistry, inorganic chemistry, biological chemistry, polymer chemistry, medicinal chemistry, and other related materials sciences. Synergistic supramolecular systems could be developed to amplify the functions and integration of molecular devices in ways that cannot be achieved by conventional single molecules. This book introduces basic concepts and examples of supramolecular chemistry in terms of cooperation and synergy, and it surveys recent progress in this field.

Supramolecular Chemistry in Water Stefan Kubik 2019-05-13 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.

Supramolecular Chemistry Stefan Kubik 2020-12-16 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.

Supramolecular Chemistry in Corrosion and Biofouling Protection Viswanathan S. Saji 2021-12-24 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.

Advances in Supramolecular Chemistry G.W. Gokel 1997-09-22 Part of a series which presents reports of efforts in all areas of supramolecular science, this volume discusses a variety of topics in the field.

Supramolecular Polymer Chemistry Akira Harada 2012-09-27 Presenting the work of pioneering experts in this exciting field of supramolecular polymer chemistry, this monograph covers an extensive range of applications, including drug delivery and catalysis. It focuses on new structures and phenomena of cyclodextrin-based supramolecular polymers and many other compound classes. While providing a deeper insight in macromolecular recognition and the mechanisms of living systems, this book also introduces fascinating novel phenomena beyond natural systems.

Supramolecular Chemistry on Surfaces Neil R. Champness 2022-05-31 Supramolecular Chemistry on Surfaces 2D Networks and 2D Structures Explore the cutting-edge in 2D chemistry on surfaces and its applications In Supramolecular Chemistry on Surfaces: 2D Networks and 2D Structures, expert chemist Neil R. Champness delivers a comprehensive overview of the rapidly developing field of two-dimensional supramolecular chemistry on surfaces. The book offers explorations of the state-of-the-art in the discipline and demonstrates the potential of the latest advances and the challenges faced by researchers in different areas. The editor includes contributions from leading researchers that address new spectroscopic methods which allow for investigations at a sub-molecular level, opening up new areas of understanding in the field. Included resources also discuss important supramolecular strategies, like hydrogen-bonding, van der Waals interactions, metal-ligand coordination, multicomponent assembly, and more. The book also provides: A thorough introduction to two-dimensional supramolecular chemistry on surfaces Comprehensive explorations of the characterization and interpretation of on-surface chemical reactions studied by ultra-high resolution scanning probe microscopy Practical discussions of complexity in two-dimensional multicomponent assembly, including explorations of coordination bonds and quasicrystalline structures In-depth examinations of covalently bonded organic structures via on-surface synthesis Perfect for polymer chemists, spectroscopists, and materials scientists, Supramolecular Chemistry on Surfaces: 2D Networks and 2D Structures will also earn a place in the libraries of physical and surface chemists, as well as surface physicists.

Anion Recognition in Supramolecular Chemistry Philip A. Gale 2011-05-26 Brett M. Rambo • Eric S. Silver • Christopher W. Bielawski • Jonathan L. Sessler Covalent Polymers Containing Discrete Heterocyclic Anion Receptors Philip A. Gale • Chang-Hee Lee Calix[n]pyrroles as Anion and Ion-Pair Complexants Wim Dehaen Calix[n]phyrins: Synthesis and Anion Recognition Hiromitsu Maeda Acyclic Oligopyrrolic Anion Receptors Jeffery T. Davis Anion Binding and Transport by Prodigiosin and Its Analogs Hemraj Juwarker • Jae-min Suk • Kyu-Sung Jeong Indoles and Related Heterocycles Pavel Anzenbacher Jr. Pyrrole-Based Anion Sensors, Part I: Colorimetric Sensors Pavel Anzenbacher Jr. Pyrrole-Based Anion Sensors, Part II: Fluorescence, Luminescence, and Electrochemical Sensors Ermitas Alcalde • Immaculada Dinarès • Neus Mesquida Imidazolium-Based Receptors Nathan L. Kilah • Paul D. Beer Pyridine and Pyridinium-Based Anion Receptors Kevin P. McDonald • Yuran Hua • Amar H. Flood 1,2,3-Triazoles and the Expanding Utility of Charge Neutral CH₃ Anion Interactions

Bioorganic, Bioinorganic and Supramolecular Chemistry P.S. Kalsi 2007-01-01

Self Assembly in Supramolecular Systems Ian M Atkinson 2007-10-31 Molecular self-assembly is a widespread phenomenon in both chemistry and biochemistry. Yet it was not until the rise of supramolecular chemistry that attention has increasingly been given to the designed self-assembly of a variety of synthetic molecules and ions. To a large extent, success in this area has reflected knowledge gained from nature. However, an increased awareness of the latent steric and electronic information implanted in individual molecular components has also contributed to this success. Whilst not yet approaching the sophistication of biological assemblies, synthetic systems of increasing subtlety and considerable aesthetic appeal have been created. Self-Assembly in Supramolecular Systems surveys highlights of the progress made in the creation of discrete synthetic assemblies and provides a foundation for new workers in the area, as well as background reading for experienced supramolecular chemists.

Applications of Supramolecular Chemistry Hans-Jörg Schneider 2012-03-28 Applications of Supramolecular Chemistry introduces the use of non-covalent interactions and molecular recognition for many fields. Applications include the analysis of technically, medically, and environmentally

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important chemical compounds, their separation, purification and removal, and the design of new materials, including supramolecular electronics. The book also explores biological interactions and applications in the food and textile industries.

Encyclopedia of Supramolecular Chemistry - Two-Volume Set (Print) Jerry L. Atwood 2013-10-09

The two-volume Encyclopedia of Supramolecular Chemistry offers authoritative, centralized information on a rapidly expanding interdisciplinary field. User-friendly and high-quality articles parse the latest supramolecular advancements and methods in the areas of chemistry, biochemistry, biology, environmental and materials science and engineering, physics, computer science, and applied mathematics. Designed for specialists and students alike, the set covers the fundamentals of supramolecular chemistry and sets the standard for relevant future research.

Analytical Methods in Supramolecular Chemistry Christoph A. Schalley 2012-09-25 The second edition of "Analytical Methods in Supramolecular Chemistry" comes in two volumes and covers a broad range of modern methods and techniques now used for investigating supramolecular systems, e. g. NMR spectroscopy, mass spectrometry, extraction methods, crystallography, single molecule spectroscopy, electrochemistry, and many more. In this second edition, tutorial inserts have been introduced, making the book also suitable as supplementary reading for courses on supramolecular chemistry. All chapters have been revised and updated and four new chapters have been added. A must-have handbook for Organic and Analytical Chemists, Spectroscopists, Materials Scientists, and Ph.D. Students in Chemistry. From reviews of the first edition: "This timely book should have its place in laboratories dealing with supramolecular objects. It will be a source of reference for graduate students and more experienced researchers and could induce new ideas on the use of techniques other than those usually used in the laboratory." Journal of the American Chemical Society (2008) VOL. 130, NO. 1 doi: 10.1021/ja0769649 "The book as a whole or single chapters will stimulate the reader to widen his horizon in chemistry and will help him to have new ideas in his research." Anal Bioanal Chem (2007) 389:2039-2040 DOI: 10.1007/s00216-007-1677-1

DNA in Supramolecular Chemistry and Nanotechnology Eugen Stulz 2015-09-28 This book covers the emerging topic of DNA nanotechnology and DNA supramolecular chemistry in its broader sense. By taking DNA out of its biological role, this biomolecule has become a very versatile building block in materials chemistry, supramolecular chemistry and bio-nanotechnology. Many novel structures have been realized in the past decade, which are now being used to create molecular machines, drug delivery systems, diagnosis platforms or potential electronic devices. The book combines many aspects of DNA nanotechnology, including formation of functional structures based on covalent and non-covalent systems, DNA origami, DNA based switches, DNA machines, and alternative structures and templates. This broad coverage is very appealing since it combines both the synthesis of modified DNA as well as designer concepts to successfully plan and make DNA nanostructures. Contributing authors have provided first a general introduction for the non-specialist reader, followed by a more in-depth analysis and presentation of their topic. In this way the book is attractive and useful for both the non-specialist who would like to have an overview of the topic, as well as the specialist reader who requires more information and inspiration to foster their own research.

Modern Supramolecular Chemistry François Diederich 2008-03-17 Written by internationally acclaimed experts, this handy volume covers all major classes of supramolecular compounds. Chapters include cyclophanes, resorcinarene and calixarene synthesis, supramolecular metallomacrocycles and macrocycle synthesis, rotaxane and catenane synthesis, cucurbiturils and porphyrins, as well as macrocyclic drugs. Each chapter contains experimental procedures allowing fast access to this type of

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synthetic chemistry.

Supramolecular Chemistry in Water Stefan Kubik 2019-09-03 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.

Advances in Supramolecular Chemistry G.W. Gokel 2000-03-07 In this volume, inorganic, organic, and bioorganic chemistry are represented in contributions from around the world. Pioneering work in self-assembled structures organized by the use of transition metals is described in chapter 1, followed by details of extensive studies of self-assembled structures formed from various biomolecules in chapter 2. The next two chapters describe the formation of spherical molecular containers and their understanding of such structures based on Platonic and Archimedean solids, and the fascinating family of synthetic peptide receptors and the interactions that can be explored using these host molecules. In chapter 5 a mixture of computational chemistry, drug design, and synthetic organic and inorganic chemistry in the development of superoxide dismutase mimics is described. The final two chapters discuss the bioorganic and supramolecular principles required for the design of synthetic artificial enzymes, and the supramolecular self-assembly and its possible role in the origin of life. It is hoped that this broad, international view of supramolecular chemistry and the many directions it leads will be of interest to those already in the field. It is also hoped that those outside the field may see extensions of their own work that will bring them into it.

Supramolecular Chemistry Jonathan W. Steed 2013-05-21 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

Anion Receptor Chemistry Jonathan L Sessler 2007-10-31 Anion recognition plays a critical role in a range of biological processes, and a variety of receptors and carriers can be found throughout the natural world. Chemists working in the area of supramolecular chemistry have created a range of anion receptors, drawing inspiration from nature as well as their own inventive processes. This book traces the origins of anion recognition chemistry as a unique sub-field in supramolecular chemistry while illustrating the basic approaches currently being used to effect receptor design. The combination of biological overview and summary of current synthetic approaches provides a coverage that is both comprehensive and comprehensible. First, the authors detail the key design motifs that have been used to generate synthetic receptors and which are likely to provide the basis for further developments. They also highlight briefly some of the features that are present in naturally occurring anion recognition and transport systems and summarise the applications of anion recognition chemistry. Providing as it does a detailed review for practitioners in the field and a concise introduction to the topic for newcomers, Anion Receptor Chemistry reflects the current state of the art. Fully referenced and illustrated in colour, it is a welcome addition to the literature.