

Transition Metals In Supramolecular Chemistry Nato Science Series C

Advanced Structural Inorganic Chemistry
Quantum Chemistry: The Challenge of
Transition Metals and Coordination Chemistry
Kirk-Othmer Encyclopedia of
Chemical Technology, Volume 24A
Practical Guide to Supramolecular
Chemistry
Frontiers in Transition Metal-Containing Polymers
Self-assembly in
Supramolecular Systems
Chemistry at the Beginning of the Third
Millennium
Computational Approaches in Supramolecular Chemistry
N4-Macrocyclic
Metal Complexes
Transition Metals in Supramolecular Chemistry
Molecular
Materials
The Chemistry of Pincer Compounds
Comprehensive Supramolecular
Chemistry: Supramolecular reactivity and transport : bioinorganic
systems
Supramolecular Chemistry
Calixarenes 50th Anniversary: Commemorative
Issue
Supramolecular Photochemistry
Metal-based Anticancer Agents
Transition
Metals in Supramolecular Chemistry
Supramolecular Chemistry in
Water
Photochemistry and Photophysics of Metal Complexes
Dynamic Combinatorial
Chemistry
Modern Supramolecular Gold Chemistry
Advances in Supramolecular
Chemistry
Introduction to Supramolecular Chemistry
Transition Metal Rimmed
Calixarenes and Their Supramolecular Chemistry
Self-Organized Morphology in
Nanostructured Materials
Supramolecular Organometallic Chemistry
Frontiers in
Chemistry: Rising Stars
Anion Coordination Chemistry
Supramolecular

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CatalysisRhodium Catalyzed HydroformylationModern Supramolecular ChemistryCore Concepts in Supramolecular Chemistry and NanochemistrySupramolecular Chemistry, 7 Volume SetMagnetism: A Supramolecular FunctionThe Organometallic Chemistry of the Transition MetalsChirality in Transition Metal ChemistryAdvances in Supramolecular ChemistrySynthesis, Structures and Characterization of Coordination Compounds with the Transition Metals, Ni(II), Cu(II), Mn(II), Cr(III), Fe(III), Using Ligands Based on Iminodiacetic Acid and N-heterocyclesEncyclopedia of Supramolecular Chemistry

Advanced Structural Inorganic Chemistry

Integrating nano and microphysical effects, this book's team of expert authors offers new insights into self-organized structure formation in nanomaterials. A major question addressed in this book is the role of spatial and temporal order. In particular, you'll discover how to apply concepts developed on macroscopic and microscopic scales to structure formation occurring on nanoscales, a key focus of interest at the frontiers of science.

Quantum Chemistry: The Challenge of Transition Metals and Coordination Chemistry

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Since the pioneering publications on coordination chemistry by Lehn and Pedersen in the late 1960s, coupled with the more orthodox interest from the transition metal chemists on template reactions (Busch, 1964), the field of supramolecular chemistry has grown at an astonishing rate. The use of transition metals as essential constituents of multi-component assemblies has been especially sharp in recent years, since the metals are prone to quick and reversible redox changes, and there is a wide variety of metal--ligand interactions. Such properties make supramolecular complexes of transition metal ions suitable candidates for exploration as light--energy converters and signal processors. Transition Metals in Supramolecular Chemistry focuses on the following main topics: (1) metal controlled organization of novel molecular assemblies and shapes; (2) design of molecular switches and devices operating through metal centres; (3) supramolecular catalysts that mimic metalloenzymes; (4) metal-containing sensory reagents and supramolecular recognition; and (5) molecular materials that display powerful electronic, optoelectronic and magnetic properties.

Kirk-Othmer Encyclopedia of Chemical Technology, Volume 24

A Practical Guide to Supramolecular Chemistry

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Fully updated and expanded to reflect recent advances, the sixth edition of this bestselling text provides students and professional chemists with a comprehensive introduction to the principles and general properties of organometallic compounds, as well as including practical information on reaction mechanisms and detailed descriptions of contemporary applications. Increased focus is given to organic synthesis applications, nanoparticle science, and green chemistry. This edition features: New sections on Multifunctional Ligands, Oxidation Catalysis, and Green Chemistry Expanded discussion on topics from the fifth edition: Supramolecular Chemistry, N-Heterocyclic Carbenes, Coupling Reactions, Organometallic Materials, Applications to Organic Synthesis, and Bioorganometallic Chemistry End-of-chapter problems and their solutions

Frontiers in Transition Metal-Containing Polymers

In response to significant developments in sensor science and technology, this book offers insight into the various extended applications and developments of N₄ macrocycle complexes in biomimetic electrocatalysis. Chapters are devoted to the chemistry, electronic and electrochemical properties of porphyrin- based polymetallated supramolecular redox catalysts and their applications in analytical and photoelectrochemical molecular devices; the use of porphyrins, phthalocyanines and related complexes as electrocatalysts for the detection of a wide variety of environmentally polluting and biologically relevant molecules; and

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the use of electropolymerized metalloporphyrin and metallophthalocyanine films as powerful materials for analytical tools, especially for sensing biologically relevant species.

Self-assembly in Supramolecular Systems

Covers the fundamentals of supramolecular chemistry; supramolecular advancements and methods in the areas of chemistry, biochemistry, biology, environmental and materials science and engineering, physics, computer science, and applied mathematics.

Chemistry at the Beginning of the Third Millennium

In this volume, an overview of the expanse of bioinorganic systems that involve supramolecular chemistry has been assembled. It commences with introductions to the supramolecular aspects of bioinorganic synthetic analogues and of metalloprotein structure and function. From there, a range of topics involving diverse metallobiomolecules (proteins, nucleic acids, and their synthetic analogues) are developed.

Computational Approaches in Supramolecular Chemistry

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Supramolecular chemistry has been defined by J.-M. Lehn as "a highly interdisciplinary field of science covering the chemical, physical, and biological features of chemical species of higher complexity, that are held together and organized by means of intermolecular (noncovalent) binding interactions" (Science, 1993). Recognition, reactivity, and transport represent three basic functional features, in essence dynamics, which may be translated into structural features. The purpose of the NATO workshop which took place September 1-5, 1993 at the Bischenberg (near Strasbourg) was to present computations which may contribute to the atomic level understanding of the structural and thermodynamical features involved in the processes of molecular recognition and supramolecular organization. of "supra-molecular modeling". Other The main focus was therefore, on the many facets applications of computers in chemistry, such as automation, simulation of processes, procedures for fitting kinetic or thermodynamic data, computer assisted synthetic strategies, use of data bases for structure elucidation or for bibliographic searches, have an obvious impact in supramolecular chemistry as well, but were not presented at the workshop.

N4-Macrocyclic Metal Complexes

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

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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 synthetic chemistry.

Transition Metals in Supramolecular Chemistry

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

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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.

Molecular Materials

Chirality in Transition Metal Chemistry is an essential introduction to this increasingly important field for students and researchers in inorganic chemistry. Emphasising applications and real-world examples, the book begins with an overview of chirality, with a discussion of absolute configurations and system descriptors, physical properties of enantiomers, and principles of resolution and preparation of enantiomers. The subsequent chapters deal with the the specifics of chirality as it applies to transition metals. Some reviews of Chirality in Transition Metal Chemistry "useful to students taking an advanced undergraduate course and

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particularly to postgraduates and academics undertaking research in the areas of chiral inorganic supramolecular complexes and materials." Chemistry World, August 2009 "the book offers an extremely exciting new addition to the study of inorganic chemistry, and should be compulsory reading for students entering their final year of undergraduate studies or starting a Ph.D. in structural inorganic chemistry." Applied Organometallic Chemistry Volume 23, Issue 5, May 2009 "In conclusion the book gives a wonderful overview of the topic. It is helpful for anyone entering the field through systematic and detailed introduction of basic information. It was time to publish a new and topical text book covering the important aspect of coordination chemistry. It builds bridges between Inorganic, organic and supramolecular chemistry. I can recommend the book to everybody who is interested in the chemistry of chiral coordination compounds ." Angew. chem. Volume 48, Issue 18, April 2009 About the Series Chirality in Transition Metal Chemistry is the latest addition to the Wiley Inorganic Chemistry Advanced Textbook series. This series reflects the pivotal role of modern inorganic and physical chemistry in a whole range of emerging areas such as materials chemistry, green chemistry and bioinorganic chemistry, as well as providing a solid grounding in established areas such as solid state chemistry, coordination chemistry, main group chemistry and physical inorganic chemistry.

The Chemistry of Pincer Compounds

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The fifth edition of the Kirk-Othmer Encyclopedia of Chemical Technology builds upon the solid foundation of the previous editions, which have proven to be a mainstay for chemists, biochemists, and engineers at academic, industrial, and government institutions since publication of the first edition in 1949. The new edition includes necessary adjustments and modernization of the content to reflect changes and developments in chemical technology.

Comprehensive Supramolecular Chemistry: Supramolecular reactivity and transport : bioinorganic systems

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-

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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.

Supramolecular Chemistry

In the past few years, supramolecular chemistry has led to new approaches in homogeneous catalysis. While host-guest chemistry had already found applications in catalysis as a result of the pioneering work carried out by Professor Ronald Breslow and Nobel prizewinner Professor Jean-Marie Lehn that began some 40 years ago, the construction of catalysts by supramolecular forces has only recently become a powerful tool. This development paves the way for large numbers of new potential catalysts that can be varied in an expedient way by changing the constituting building blocks. Written by some of the leading contributors in the field, this book is intended for both industrial and academic chemists with an interest in this area of catalysis. With its discussion of topics from ligand libraries to chirality-directed self-assembly, this is a must-have for chemists with organic, catalytic and polymer backgrounds, as well as those employing such compounds in industrial processes.

Calixarenes 50th Anniversary: Commemorative Issue

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“ the book does an excellent job of putting together several different classes of materials. Many common points emerge, and the book may facilitate the development of hybrids in which the qualities of the “parents” are enhanced.”
–Angew. Chem. Int. Ed. 2011 With applications in optoelectronics and photonics, quantum information processing, nanotechnology and data storage, molecular materials enrich our daily lives in countless ways. These materials have properties that depend on their exact structure, the degree of order in the way the molecules are aligned and their crystalline nature. Small, delicate changes in molecular structure can totally alter the properties of the material in bulk. There has been increasing emphasis on functional metal complexes that demonstrate a wide range of physical phenomena. Molecular Materials represents the diversity of the area, encapsulating magnetic, optical and electrical properties, with chapters on: Metal-Based Quadratic Nonlinear Optical Materials Physical Properties of Metallomesogens Molecular Magnetic Materials Molecular Inorganic Conductors and Superconductors Molecular Nanomagnets Structured to include a clear introduction, a discussion of the basic concepts and up-to-date coverage of key aspects, each chapter provides a detailed review which conveys the excitement of work in that field. Additional volumes in the Inorganic Materials Series: Low-Dimensional Solids | Molecular Materials | Porous Materials | Energy Materials

Supramolecular Photochemistry

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Perspectives in Supramolecular Chemistry will relate recent developments and new exciting approaches in supramolecular chemistry. In supramolecular chemistry, our aim is to understand molecular chemistry beyond the covalent bond - the series will concentrate on goal-orientated supramolecular chemistry. Perspectives in Supramolecular Chemistry will reflect research which develops supramolecular structures with specific new properties, such as recognition, transport and simulation of biosystems or new materials. The series will cover 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.

Transition Metals in Supramolecular Chemistry Edited by Jean-Pierre Sauvage, Université Louis Pasteur, Strasbourg, France The chemistry of weak forces and non-covalent interactions as pioneered by Pedersen, Lehn and Cram is considered to be the origin of modern supramolecular chemistry. 30 years ago transition metals and their complexes were not regarded as important to this science. Transition Metals in Supramolecular Chemistry clearly demonstrates that today, transition metal complexes are routinely used to build large multicomponent architectures which display new and exciting applications including molecular switches, liquid crystals, and molecular magnets. Contents * Ligand and Metal Control of Self-Assembly in Supramolecular Chemistry * Bistability in Iron (II) Spin-Crossover Systems: A Supramolecular Function * Luminescent Sensors with and for Transition Metals * The Chirality of Polynuclear Transition Metal Complexes * Design and Serendipity

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in the Synthesis of Polynuclear Compounds of the 3d-metals * Rotaxanes: From Random to Transition Metal-Templated Threading of Rings at the Molecular Level * Metallomesogens - Supramolecular Organisation of Metal Complexes in Fluid Phases * Self-Assembly of Interlocked Structures with Cucurbituril Metal Ions and Metal Complexes Reflecting contemporary science, Transition Metals in Supramolecular Chemistry will inspire scientists and students interested in coordination chemistry, magnetochemistry, molecular sensors and switches, liquid crystals and artificial systems.

Metal-based Anticancer Agents

This long-awaited first book on this exciting new field in organic and supramolecular chemistry explains the fundamentals as well as possible applications of DCC. Authored by the "Who's Who" of DCC it spans the whole range of topics: catalysts, sensors, polymers, ligands, receptors, concluding with a look at future developments and perspectives. All set to become the standard text in the field, this one-stop reference contains everything organic, catalytic, polymer, physical and biochemists need to know.

Transition Metals in Supramolecular Chemistry

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Focusing on practical applications, the author provides a balanced introduction to the many possible technological uses of metal complexes. Coverage includes the transition metals, lanthanide and actinide complexes, metal porphyrins, and many other complexes. This volume meets the needs of students and scientists in inorganic chemistry, chemical physics, and solid-state physics.

Supramolecular Chemistry in Water

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

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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

Photochemistry and Photophysics of Metal Complexes

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.

Dynamic Combinatorial Chemistry

In the last decade there have been numerous advances in the area of rhodium-catalyzed hydroformylation, such as highly selective catalysts of industrial importance, new insights into mechanisms of the reaction, very selective asymmetric catalysts, in situ characterization and application to organic synthesis. The views on hydroformylation which still prevail in the current textbooks have become obsolete in several respects. Therefore, it was felt timely to collect these advances in a book. The book contains a series of chapters discussing several rhodium systems arranged according to ligand type, including asymmetric ligands, a chapter on applications in organic chemistry, a chapter on modern processes and separations, and a chapter on catalyst preparation and laboratory techniques. This

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book concentrates on highlights, rather than a concise review mentioning all articles in just one line. The book aims at an audience of advanced students, experts in the field, and scientists from related fields. The didactic approach also makes it useful as a guide for an advanced course.

Modern Supramolecular Gold Chemistry

A revised and updated English edition of a textbook based on teaching at the final year undergraduate and graduate level. It presents structure and bonding, generalizations of structural trends, crystallographic data, as well as highlights from the recent literature.

Advances in Supramolecular Chemistry

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

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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.

Introduction to Supramolecular Chemistry

Transition Metal Rimmed Calixarenes and Their Supramolecular Chemistry

The Frontiers in Chemistry Editorial Office team are delighted to present the inaugural “Frontiers in Chemistry: Rising Stars” article collection, showcasing the high-quality work of internationally recognized researchers in the early stages of their independent careers. All Rising Star researchers featured within this

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collection were individually nominated by the Journal's Chief Editors in recognition of their potential to influence the future directions in their respective fields. The work presented here highlights the diversity of research performed across the entire breadth of the chemical sciences, and presents advances in theory, experiment and methodology with applications to compelling problems. This Editorial features the corresponding author(s) of each paper published within this important collection, ordered by section alphabetically, highlighting them as the great researchers of the future. The Frontiers in Chemistry Editorial Office team would like to thank each researcher who contributed their work to this collection. We would also like to personally thank our Chief Editors for their exemplary leadership of this article collection; their strong support and passion for this important, community-driven collection has ensured its success and global impact. Laurent Mathey, PhD Journal Development Manager

Self-Organized Morphology in Nanostructured Materials

Over the last twenty years, developments of the ab initio methodologies and of the computing capacities have progressively turned quantum chemistry into a predictive tool for molecular systems involving only light elements. The situation appears less advanced for systems containing transition metal elements where specific difficulties arise, like those linked to the quasi-degeneracy of the lowest atomic states. Correlation effects, which are important only for quantitative

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accuracy in the treatment of molecules made of light elements, need sometimes to be considered even for a qualitative description of transition metals systems (like the multiple metal-metal bond). The treatment of atoms of a high atomic number has necessitated the development of model potential methods. These difficulties exacerbate for systems containing several transition atoms a correct description of the dichromium molecule Cr_2 still represents a challenge to quantum chemists. Yet many advances have been made recently in the theoretical treatment of these systems, despite the fact that our understanding still remains disparate with a variety of models and methodologies used more or less successfully (one-electron models, explicitly correlated ab initio methods, density functional formalisms). For these reasons, a NATO Advanced Research Workshop was organized to review in detail the state-of-the-art techniques and at the same time the most common applications. These encompass many fields including the spectroscopy of diatomics and small aggregates, structure and reactivity problems in organometallic chemistry, the cluster surface analogy with its implications for heterogeneous catalysis and the description of extended structures.

Supramolecular Organometallic Chemistry

Filling a gap in our systematic knowledge of gold, this monograph covers the fundamental aspects, while also considering new applications of gold compounds in catalysis, as nanoparticles, and their potential application as luminescent

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compounds. Written by an eminent team of authors from academia, the book analyzes the current status of gold chemistry, its special characteristics, oxidation states and main type of complexes, before going on to look at the synthesis of supramolecular aggregates due to the formation of gold-gold, gold-metal interactions or other secondary bonds. Final sections deal with LEDs, solvoluminescent and electroluminescent materials, liquid crystals and catalysis. While of interest to advanced chemistry students, this book is also useful for researchers interested in the chemistry of gold and its applications, as well as those involved in metal-metal interactions, heteronuclear chemistry or in the optical properties of coordination compounds.

Frontiers in Chemistry: Rising Stars

Metal-based anticancer drugs are among the most successful therapeutic agents, as evidenced by the frequent prescription of selected platinum and arsenic compounds to patients. *Metal-based Anticancer Agents* covers the interdisciplinary world of inorganic drug discovery and development by introducing the most prominent compound classes based on different transition metals, discussing emerging concepts and enabling methods, as well as presenting key pre-clinical and clinical aspects. Recent progress on the unique features of next-generation targeted metal-based anticancer agents, including supramolecular coordination complexes used for both therapy and drug delivery, promise a bright future

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beyond the benefits of pure cytotoxic activity. With contributions from global leaders in the field, this book will serve as a useful reference to established researchers as well as a practical guide to those new to metallodrugs, and postgraduate students of medicinal chemistry and metallobiology.

Anion Coordination Chemistry

A detailed, up-to-date review of transition metal-containing polymers Promising advances in the electrical, optical, magnetic, biological, and catalytic properties that metal-containing polymers possess have led to notable expansion in the field of transition metal-containing polymers. *Frontiers in Transition Metal-Containing Polymers* provides a comprehensive, up-to-date review of the synthesis, properties, and applications of transition metal-containing polymers, including an overview of the historical development of these types of polymers. Written by the leading researchers in the field, this thorough volume covers the routes to organometallic and coordination polymers, as well as characterization and applications of transition metal-containing monomers and polymers. Other topics discussed include: Metallo-supramolecular coordination polymers based on nitrogen ligands Coordination polymers based on phosphorus ligands Polypeptide-based metallobiopolymers and DNA-based metallopolymers Metallodendrimers Self-assembly of metal-containing block copolymers Applications including drug delivery, optics, molecular devices, sensors, conductive materials, and more

Supramolecular Catalysis

We are proud to celebrate the 50th anniversary of the calixarenes. In 1944, Zinke and Ziegler proposed a cyclotetrameric structure for an oligomer extracted from the condensation product mixture obtained by reacting p-tert-butyl phenol with formaldehyde in the presence of sodium hydroxide. Fifty years on, calixarenes are the basis of many different areas of chemical research, with development occurring at an increasing pace over the past decade in particular. The present volume does not provide an overview of all these developments, but is rather a celebration of some of the highlights. This presentation of the intricate mosaic of diversity that characterizes calixarene chemistry will stimulate further developments in this fascinating field.

Rhodium Catalyzed Hydroformylation

Pincer complexes are formed by the binding of a chemical structure to a metal atom with at least one carbon-metal bond. Usually the metal atom has three bonds to a chemical backbone, enclosing the atom like a pincer. The resulting structure protects the metal atom and gives it unique properties. The last decade has witnessed the continuous growth in the development of pincer complexes. These species have passed from being curiosity compounds to chemical chameleons able

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to perform a wide variety of applications. Their unique metal bound structures provide some of the most active catalysts yet known for organic transformations involving the activation of bonds. The Chemistry of Pincer Compounds details use of pincer compounds including homogeneous catalysis, enantioselective organic transformations, the activation of strong bonds, the biological importance of pincer compounds as potential therapeutic or pharmaceutical agents, dendrimeric and supported materials. * Describes the chemistry and applications of this important class of organometallic and coordination compounds * Covers the areas in which pincer complexes have had an impact * Includes information on more recent and interesting pincer compounds not just those that are well-known

Modern Supramolecular Chemistry

Molecular magnetism is a new field of research dealing with the synthesis and study of the physical properties of molecular assemblies involving open-shell units. It is essentially interdisciplinary, joining together organic, organometallic and inorganic chemists, as well as theoreticians, physicists and materials scientists. At the core of research into molecular magnetism lie design and synthesis of new molecular assemblies exhibiting bulk properties such as long-range magnetic ordering or bistability with an hysteresis effect, which confers a memory effect on the system. In such terms, magnetism may be considered a supramolecular function. The first eight contributions to this volume present the state of the art in

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organic supramolecular chemistry, emphasising interlocked systems and molecular trees. The following six articles are devoted to molecular materials constructed from organic radicals and transition metal units. Molecular bistability is then focused on, followed by metal-organic and coordination magnetic materials. A new approach to nano-sized particles closes the work.

Core Concepts in Supramolecular Chemistry and Nanochemistry

Supramolecular Chemistry, 7 Volume Set

This book consists of 15 chapters, written by authoritative specialists, on some of the most intriguing and promising topics of modern chemistry. The authors describe the lines along which chemical research will develop in the next decade, using a plain language well understandable even by non-specialists. The book originated from the lectures presented on the occasion of a meeting held in Pavia, Italy, "Chemistry at the Beginning of the Third Millennium" by distinguished scientists from the Universities of Bologna, Heidelberg, Jena, Padua, Pavia and Siena.

Magnetism: A Supramolecular Function

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

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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.

The Organometallic Chemistry of the Transition Metals

Building on the pioneering work in supramolecular chemistry from the last 20 years or so, this monograph addresses new and recent approaches to anion coordination chemistry. Synthesis of receptors, biological receptors and metallareceptors, the energetics of anion binding, molecular structures of anion complexes, sensing devices are presented and computational studies addressed to aid with the understanding of the different driving forces responsible for anion complexation. The reader is promised an actual picture of the state of the art for this exciting and constantly evolving field of supramolecular anion coordination chemistry. The topics range from ion channels to selective sensors, making it attractive to all researchers and PhD students with an interest in supramolecular chemistry.

Chirality in Transition Metal Chemistry

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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.

Advances in Supramolecular Chemistry

The intellectual and utilitarian opportunities that lie at the frontiers of chemistry have been recently emphasized by the Pimentel Report. Such report recommends that in the field of chemical research priority should be given to "understanding chemical reactivity" and proposes initiatives aimed at the clarification of factors that control the rates of reaction and the development of new synthetic pathways for chemical change. In the broad field of chemical reactivity, a discipline that has grown with an extraordinary rate is photochemistry. Since the knowledge of the

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photochemical properties at the molecular level has made a substantial progress in the last few years, there is currently a trend to study more and more complex photochemical systems. In particular, an emerging and rapidly expanding branch of photochemistry is that concerning studies of assemblies of molecular components properly combined so as to obtain light-induced functions (supramolecular photochemistry). Although much of the current work in supramolecular photochemistry is fundamental in nature, it is clear that progress in this field will be most rewarding for several applications concerning the interaction of light with matter. In particular, it will allow us to pursue research aimed at the photochemical conversion of solar energy by means of artificial systems and to make progress towards futuristic branches of science called "photonics" (photo-generated electron migration processes on a molecular basis) and "chemionics" (design of components, circuitry, and information treatment at the molecular level).

Synthesis, Structures and Characterization of Coordination Compounds with the Transition Metals, Ni(II), Cu(II), Mn(II), Cr(III), Fe(III), Using Ligands Based on Iminodiacetic Acid and N-heterocycles

The aim of this book is to return to the biomimicry and medicinal potential that

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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.

Encyclopedia of Supramolecular Chemistry

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

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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

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