Chiral Co Crystallization For Enantiomer Separation

Amplification of Chirality presents critical reviews of the present position and future trends in modern chemical research. The book contains short and concise reports on chemistry. Each is written by the world renowned experts. Still valid and useful after 5 or 10 years, more information as well as the electronic version of the whole content available at: springerlink.com.

Crystallization is used at some stage in nearly all

process industries as a method of production, purification or recovery of solid materials. In recent years, a number of new applications have also come to rely on crystallization processes such as the crystallization of nano and amorphous materials. The articles for this book have been contributed by the most respected researchers in this area and cover the frontier areas of research and developments in crystallization processes. Divided into five parts this book provides the latest research developments in many aspects of crystallization including: chiral crystallization, crystallization of nanomaterials and the crystallization of amorphous

and glassy materials. This book is of interest to both fundamental research and also to practicing scientists and will prove invaluable to all chemical engineers and industrial chemists in the process industries as well as crystallization workers and students in industry and academia.

Covering every essential element in the development of chiral products, this reference provides a solid overview of the formulation, biopharmaceutical characteristics, and regulatory issues impacting the production of these pharmaceuticals. It supports researchers as they evaluate the pharmacodynamic, pharmacokinetic,

and toxicological characteristics of specific enantiomers and chiral drug compounds and addresses in one convenient reference all the major challenges pertaining to drug chirality that have been neglected in the literature. Chirality in Drug Design and Development collects the latest studies from an interdisciplinary team of experts on chiral drug design.

Supramolecular chemistry deals with the organisation of molecules into defined assemblies using non-covalent interactions, including weaker and reversible interactions such as hydrogen bonds, and metal-ligand interactions. The aspect of

stereochemistry within such chemical architectures, and in particular chirality, is of special interest as it impacts on considerations of molecular recognition, the development of functional materials, the vexed question of homochirality, nanoscale effects of interactions at interfaces, biocatalysis and enzymatic catalysis, and applications in organic synthesis. Chirality in Supramolecular Assemblies addresses many of these aspects, presenting a broad overview of this important and rapidly developing interdisciplinary field. Topics covered include: Origins of molecular and topological chirality Homochirogenesis Chirality in crystallinity

Host-guest behavior Chiral influences in functional materials Chirality in network solids and coordination solids Aspects of chirality at interfaces Chirality in organic assemblies Chirality related to biocatalysis and enzymes in organic synthesis. This book is a valuable reference for researchers in the molecular sciences, materials science and biological science working with chiral supramolecular systems. It provides summaries and special insights by acknowledged international experts in the various fields.

Chiral Separation Techniques

Crystal Engineering: From Molecules and Crystals

to Materials
Molecular Biology in Medicinal Chemistry
Advances in Crystallization Processes
From Simple Amphiphiles to Protocell Models
Comprehensive Supramolecular Chemistry II

Crystallization is a natural occurring process but also a process abundantly used in the industry. Crystallization can occur from a solution, from the melt or via deposition of material from the gas phase (desublimation). Crystals distinguish themself from liquids,

gases and amorphous substances by the long-range order of its building blocks that entail the crystals to be formed of well-defined faces, and give rise to a large number of properties of the solid. Crystallization is used at some stage in nearly all process industries as a method of production, purification or recovery of solid materials. Crystallization is practiced on all scales: from the isolation of the first milligrams of a newly synthesized

substance in the research laboratory to isolating products on the mulit-million tonne scale in industry. The book describes the breadth of crystallization operations, from isolation from a reaction broth to purification and finally to tailoring product properties. In the first section of the book, the basic mechanisms - nucleation, growth, attrition and agglomeration are introduced. It ensures an understanding

of supersaturation, the driving force of crystallization. Furthermore, the solubility of the substance and its dependences on process conditions and the various techniques of crystallization and their possibilities and limitations are discussed. Last but not least, the first part includes an intensive treatment of polymorphism . The second part builds on the basics, exploring how crystallization processes can be developed, either batch-wise or

continuous, from solution or from the melt. A discussion of the purification during crystallization serves as a link between the two sections, where practical aspects and an insight using theoretical concepts are combined. Mixing and its influence on the crystallization as well as the mutual interference of down-stream processes with the crystallization are also treated. Finally, techniques to characterize the crop are discussed.

The third part of the book is dedicated to accounts of actual developments and of carried-out crystallizations. Typical pitfalls and strategies to avoid these as well as the design of robust processes are presented.
In spite of important advances in asymmetric synthesis, chiral compounds cannot all be obtained in a pure state by asymmetric synthesis. As a result, enantiomer separation remains an important technique for obtaining

optically active materials. Although asymmetric synthesis is a once-only procedure, an enantiomer separation process can be repeated until the optically pure sample is obtained. This book discusses several new enantiomer separation methods using modern techniques developed by experts in the field. These methods consist mainly of the following three types: 1) Enantiomer separation by inclusion complexation with a chiral host

compound 2) Enantiomer separation using biological methods 3) Enantiomer separation by HPLC chromatography using a column containing a chiral stationary phase. Separation of a racemic compound has been called "optical resolution" or simply "resolution". Nowadays, the descriptions "enantiomer resolution" or "enantiomer separation" are also commonly used. Accordingly, "Enantiomer Separation" is used in the title of this book. The editor and all chapter

contributors hope that this book is helpful for scientists and engineers working in this field.

This unique book focuses on the currently 'hot topic' of Pharmaceutical Salts and Co-crystals. Combining both reports of the latest academic research and comprehensive overviews of basic principles, with more applied contributions from selected experts in industry.

This is a completely revised and

updated sequel to 'A Practical Approach to Chiral Separations by Liquid Chromatography' by the same editor. The scope has been extended to further chiral separation techniques like electrophoresis, membrane separations, or biological assays. More emphasis is put on preparative separation techniques. From reviews of the previous edition: 'A team of experts from academic and industrial laboratories throughout the world have

compiled their findings and experience to make this book an exceptionally timely and unique contribution to the field' European Journal of Drug Metabolism 'The dense mass of information contained in this book will make it a valuable resource ...' Chemical Engineering Research '... this is a worthwhile addition to the expanding chiral literature and the book should be of value to those working in this field' The Analyst

Chirality in Drug Design and Development

Enantiomer Separation

Molecules, Supramolecular Assemblies and Materials

Basic Concepts and Industrial Applications

Multi-Component Crystals

A Handbook (Ten-Volume Set)

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

This book highlights the current state-of-the-art regarding the application of applied crystallographic methodologies for understanding, predicting and controlling the transformation from the molecular to crystalline state with the latter exhibiting

pre-defined properties. This philosophy is built around the fundamental principles underpinning the three inter-connected themes of Form (what), Formation (how) and Function (why). Topics covered include: molecular and crystal structure, chirality and ferromagnetism, supramolecular assembly, defects and reactivity, morphology and surface energetics. Approaches for preparing crystals and nano-crystals with novel physical, chemical and mechanical properties include: crystallisation, seeding, phase diagrams, polymorphic control, chiral separation, ultrasonic techniques and mechano-chemistry. The vision is realised through examination of a range of advanced analytical characterisation techniques including in-situ studies. The work is underpinned through an unprecedented structural

perspective of molecular features, solid-state packing arrangements and surface energetics as well as in-situ studies. This work will be of interest to researchers, industrialists, intellectual property specialists and policy makers interested in the latest developments in the design and supply of advanced high added-value organic solid-form materials and product composites.

For the last decade, the topics of organic crystal chemistry have become diversified, and each topic has been substantially advanced in concert with the rapid development of various analytical and measurement techniques for solid-state organic materials. The aim of this book is to systematically summarize and record the recent notable advances in various topics of organic crystal chemistry

involving liquid crystals and organic–inorganic hybrid materials that have been achieved mainly in the last 5 years or so. The authors are invited members of the Division of Organic Crystals, The Chemical Society of Japan (CSJ), and prominent invited experts from abroad. This edited volume is planned to be published periodically, at least every 5 years, with contributions by prominent authors in Japan and from abroad.

Chirality in Drug Design and DevelopmentCRC Press

Low-Dimensional Materials and Morphologies (Volume Four)

Pharmaceutical Salts and Co-crystals

Cocrystal Applications in Drug Delivery

Amino Acids and the Asymmetry of Life

Approaches and Techniques

In this volume, contributions covering the theoretical and practical aspects of multicomponent crystals provide a timely and contemporary overview of the state-of-the art of this vital aspect of crystal engineering/materials science. With a solid foundation in fundamentals, multi-component crystals can be formed, for example, to enhance pharmaceutical properties of drugs, for the specific control of optical responses to external stimuli and to assemble molecules to allow chemical reactions that are generally

intractable following conventional methods. Contents Pharmaceutical co-crystals: crystal engineering and applications Pharmaceutical multi-component crystals: improving the efficacy of anti-tuberculous agents Qualitative and quantitative crystal engineering of multi-functional co-crystals Control of photochromism in N-salicylideneaniline by crystal engineering Quinoline derivatives for multi-component crystals: principles and applications N-oxides in multi-component crystals and in bottom-up synthesis and applications Multi-component crystals and non-ambient conditions

Co-crystals for solid-state reactivity and thermal expansion Solution co-crystallisation and its applications The salt-co-crystal continuum in halogen-bonded systems Large horizontal displacements of benzene-benzene stacking interactions in co-crystals Simultaneous halogen and hydrogen bonding to carbonyl and thiocarbonylfunctionality Crystal chemistry of the isomeric N,N ' -bis(pyridin-n-ylmethyl)-ethanediamides, n = 2, 3 or 4 Solute • solvent interactions mediated by main group element (lone-pair) • • • π (aryl)

interactions

21st Century Nanoscience - A Handbook: Low-Dimensional Materials and Morphologies (Volume 4) will be the most comprehensive, up-to-date large reference work for the field of nanoscience. Handbook of Nanophysics by the same editor published in the fall of 2010 and was embraced as the first comprehensive reference to consider both fundamental and applied aspects of nanophysics. This follow-up project has been conceived as a necessary expansion and full update that considers the significant advances made in the field since

2010. It goes well beyond the physics as warranted by recent developments in the field. This fourth volume in a ten-volume set covers low-dimensional materials and morphologies. Key Features: Provides the most comprehensive, up-to-date large reference work for the field. Chapters written by international experts in the field. Emphasises presentation and real results and applications. This handbook distinguishes itself from other works by its breadth of coverage, readability and timely topics. The intended readership is very broad, from students and instructors to engineers, physicists,

chemists, biologists, biomedical researchers, industry professionals, governmental scientists, and others whose work is impacted by nanotechnology. It will be an indispensable resource in academic, government, and industry libraries worldwide. The fields impacted by nanophysics extend from materials science and engineering to biotechnology, biomedical engineering, medicine, electrical engineering, pharmaceutical science, computer technology, aerospace engineering, mechanical engineering, food science, and beyond.

The long-awaited volume on synthetic chemistry in the series "Methods and Principles in Medicinal Chemistry" is now available. In the pharmaceutical industry, computational methods play a major role in the discovery and development of new drugs. Yet, the SYNTHESIS of these compounds still remains the most crucial topic in drug design. Written by an internationally renowned team of authors and editors from academia and industry, this volume describes all recent developments in organic synthetic methodology which are essential for pharmaceutical research. The most modern

synthetic developments of pharmacologically interesting compounds (carbohydrates and nucleotides) as well as important synthetic methods such as combinatorial chemistry, solid-phase reactions, bioassisted organic synthesis and asymmetric synthesis are critically discussed. Special emphasis is given to a hands-on practical approach which enables researchers to apply the featured methods immediately to their specific problems. Also, the detailed presentation of the topic and the selection of references will be of help to any researcher working in the laboratory.

The only standard reference in this exciting new field combines the physical, chemical and material science perspectives in a synergic way. This monograph traces the development of the preparative methods employed to create nanostructures, in addition to the experimental techniques used to characterize them, as well as some of the surprising physical effects. The chapters cover every category of material, from organic to coordination compounds, metals and composites, in zero, one, two and three dimensions. The book also reviews structural,

chemical, optical, and other physical properties, finishing with a look at the future for chiral nanosystems.

Comprehensive Reviews 2015

Novel Optical Resolution Technologies

Comprehensive Organic Chemistry Experiments for the Laboratory Classroom

New Trends in Synthetic Medicinal Chemistry, Volume 7

Chirality at the Nanoscale

Chirality in Supramolecular Assemblies

Technological and computational advances in the past decade

have meant a vast increase in the study of crystalline matter in both organic, inorganic and organometallic molecules. These studies revealed information about the conformation of molecules and their coordination geometry as well as the role of intermolecular interactions in molecular packing especially in the presence of different intermolecular interactions in solids. This resulting knowledge plays a significant role in the design of improved medicinal, mechanical, and electronic properties of single and multi-component solids in their crystalline state. Understanding Intermolecular Interactions in the Solid State explores the different techniques used to investigate the interactions, including hydrogen and halogen bonds, lone pair-pi, and pi-pi interactions, and their role in

crystal formation. From experimental to computational approaches, the book covers the latest techniques in crystallography, ranging from high pressure and in situ crystallization to crystal structure prediction and charge density analysis. Thus this book provides a strong introductory platform to those new to this field and an overview for those already working in the area. A useful resource for higher level undergraduates, postgraduates and researchers across crystal engineering, crystallography, physical chemistry, solid-state chemistry, supramolecular chemistry and materials science.

This expansive and practical textbook contains organic chemistry experiments for teaching in the laboratory at the undergraduate level covering a range of functional group

transformations and key organic reactions.The editorial team have collected contributions from around the world and standardized them for publication. Each experiment will explore a modern chemistry scenario, such as: sustainable chemistry; application in the pharmaceutical industry; catalysis and material sciences, to name a few. All the experiments will be complemented with a set of questions to challenge the students and a section for the instructors, concerning the results obtained and advice on getting the best outcome from the experiment. A section covering practical aspects with tips and advice for the instructors, together with the results obtained in the laboratory by students, has been compiled for each experiment. Targeted at professors and lecturers in

chemistry, this useful text will provide up to date experiments putting the science into context for the students.
Introduction what is organic chemistry all about?; Structural organic chemistry the shapes of molecules functional groups; Organic nomenclature; Alkanes; Stereoisomerism of organic molecules; Bonding in organic molecules atomic-orbital models; More on nomenclature compounds other than hydrocarbons; Nucleophilic substitution and elimination reactions; Separation and purification identification of organic compounds by spectroscopic techniques; Alkenes and alkynes. Ionic and radical addition reactions; Alkenes and alkynes; Oxidation and reduction reactions; Acidity or alkynes.
The two-word title of this book can only give an indication

about its content and approach to the subject it deals with. In the course of time, the term has gradually become somewhat blurred. The reason is easy to see: similar problems are now more and more frequently studied by different branches of natural science. The term "mixed crystals" has acquired specific connotations in physics, chemistry, biology, and geology. One and the same term can now serve as a name for things which are either not quite the same or sometimes quite different. And this is precisely what happened to the two words in the title of the book. One of them, the term "crystal", for which crystallography had an un ambiguous definition, is now employed by biologists to describe the structure of cell membranes and by chemists who use it to denote degrees of

polymer crystallinity. "Crystal" has thus become a broad term that can help describe any solid, or just a condensed state of a substance, if the solid has a suf ficient degree of order in the arrangement of its components. But the book is called "~lixed Crystals". The other word in its title, the adjective "mixed", has also developed several meanings. It is now thought ap plicable to both homogeneous and heterogeneous systems, that is, to crystals composed of different molecules and also to solids that are a mixture of crys tals with different structures.

Advances in Organic Crystal Chemistry

Separations and Reactions in Organic Supramolecular Chemistry

Chirality in Transition Metal Chemistry

Advanced Topics in Crystallization
Basic Principles of Organic Chemistry
Crystallization

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 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.

Crystal engineering is an interdisciplinary area that cuts across the traditional subdivisions of chemistry. Fuelled by our increasingly precise understanding of the chemistry and properties of supramolecular systems, interest in the potential of the field has increased rapidly. The topics discussed in the 28 contributions in this book provide a state-of-the-art description of the field and offer new research ideas that, if pursued, will serve to strengthen the field at the interface between

supramolecular chemistry and materials science.
In 2015, the first pharmaceutical cocrystal was approved by the FDA. Since then, the number of cocrystals on the market and in the development pipeline has been slowly but steadily growing. It is now well established that cocrystals are a versatile new approach to oral drug formulation. This Reprint Book is a collection of articles that show the utility of pharmaceutical cocrystals and various aspects of cocrystal research: • Cocrystals as a strategy to modify the physicochemical properties of a drug such as dissolution behaviour, tabletability, and melting point; • Development of new coformers; • Screening studies for multiple cocrystal forms; •

Cocrystals in nano-sized drug delivery.

From crystal structure prediction to totally empirical screening, the quest for new crystal forms has become one of the most challenging issues in the solid state science and particularly in the pharmaceutical world. In this context, multi-component crystalline materials like co-crystals have received renewed interest as they offer the prospect of optimized physical properties. As illustrated in this first book_ entirely dedicated to this emerging class of pharmaceutical compounds_ the outcome of such endeavours into crystal engineering have demonstrated clear impacts on production, marketing and intellectual property protection of active

pharmaceutical ingredients (APIs). Indeed, co-crystallization influences relevant physico-chemical parameters (such as solubility, dissolution rate, chemical stability, melting point, hygroscopicity, à) and often offers solids with properties superior to those of the free drug. Combining both reports of the latest research and comprehensive overviews of basic principles, with contributions from selected experts in both academia and industry, this unique book is an essential reference, ideal for pharmaceutical development scientists and graduate students in pharmaceutical science.

Preparation, Characterization and Applications

Atomically Precise Metal Nanoclusters

Comprehensive Reviews 2020
Handbook of Chiral Chemicals
Fundamentals and Practical Methods
Engineering Crystallography: From Molecule to Crystal to Functional Form

This readily comprehensible book explains the identification of molecular targets via cellular assays, reporter genes or transgenic models, as well as surveying recent advances in the synthesis, separation and analysis of drugs. A special section is devoted to molecular genetics methods. With its examination of these novel methods and generous practical advice, this is

essential reading for all pharmaceutical chemists, molecular biologists and medical researchers using molecular methods to study drugs and their action.

Atomically precise metal nanocluster research has emerged as a new frontier. This book serves as an introduction to metal nanoclusters protected by ligands. The authors have summarized the synthesis principles and methods, the characterization methods and new physicochemical properties, and some potential applications. By pursuing atomic precision, such nanocluster materials provide unprecedented

opportunities for establishing precise relationships between the atomic-level structures and the properties. The book should be accessible to senior undergraduate and graduate students, researchers in various fields (e.g., chemistry, physics, materials, biomedicine, and engineering), R&D scientists, and science policy makers.

As pharmaceutical companies look to develop single enantiomers as drug candidates, chemists are increasingly faced with the problems associated with this subclass of organic synthesis. "The Handbook of Chiral Chemicals, Second

Edition" highlights the problems associated with the production of chiral compounds on a commercial scale. The handbook fir

This book includes both fundamental studies and applications in a multidisciplinary research field involving a high diversity of chiral compounds, including commercial substances with industrial applications, pharmaceuticals, and new chiral compounds with promising biological activities. Recent developments and innovative approaches to producing enantiomerically pure compounds of industrial and research interest are included. Enantiomeric separation in both the analytical

and preparative scale, determination of the enantiomeric purity, insights into enantioselective synthesis and many different aspects of chiral recognition, including chiral sensors, recognition in biological systems, and in analytical methods, are presented. Original research and review articles show the broad scope of chirality in diverse analytical fields and the connection to enantioselective synthesis and biological activities.

A Practical Approach

Topics in Stereochemistry

21st Century Nanoscience – A Handbook

Stereoselective Synthesis of Drugs and Natural Products

Co-crystals

21st Century Nanoscience

Multi-component crystalline systems or co-crystals have received tremendous attention from academia and industry alike in the past decade. Applications of co-crystals are varied and are likely to positively impact a wide range of industries dealing with molecular solids. Co-crystallization has been used to improve the properties and performance of

materials from pharmaceuticals to energetic materials, as well as for separation of compounds. This book combines co-crystal applications of commercial and practical interest from diverse fields in to a single volume. It also examines effective structural design of co-crystals, and provides insights into practical synthesis and characterization techniques. Providing a useful resource for postgraduate students new to applied co-crystal research and crystal engineering, it will also be of interest

to established researchers in academia or industry.

In nearly all process industries, crystallization is used at some stage as a method of production, purification or recovery of solid materials. In recent years, a number of new applications have also come to rely on crystallization processes such as the crystallization of nano and amorphous materials. The articles in this book have been contributed by some of the most respected researchers in this area and cover the frontier areas of

research and developments in crystallization processes. Divided into three sections, this book provides the latest research developments in many aspects of crystallization including the crystallization of biological macromolecules and pharmaceutical compounds, the crystallization of nanomaterials and the crystallization of amorphous and glassy materials. This book is of interest to both fundamental research and practicing scientists and will prove invaluable to all chemical

engineers and industrial chemists in process industries, as well as crystallization workers and students in industry and academia.

Divided into the three main sections of synthesis, analysis and drug development, this handbook covers all stages of the drug development process, including large-scale synthesis and purification of chirally pure pharmaceuticals. The two editors from academia and a major pharmaceutical company have assembled an experienced, international team who

provide first-hand practical advice and report previously unpublished data. In the first section, the isolation of chiral drugs from natural sources, their production in enzymatic processes and the resolution of racemic mixtures in preparative chromatography are outlined in separate chapters. For the section on qualitative and quantitative analysis, enantioselective chromatographic methods are presented as well as optical methods and CE-MS, while the final section deals with the pharmacology, pharmacokinetics

and metabolic aspects of chiral drugs, devoting whole chapters to stereoselective drug binding and modeling chiral drug-receptor interactions. With its unique industry-relevant aspects, this is a must for medicinal and pharmaceutical chemists. This book summarizes and records the recent notable advances in diverse topics in organic crystal chemistry, which has made substantial progress along with the rapid development of a variety of analysis and measurement techniques for solid organic materials. This review book is one

of the volumes that are published periodically on this theme. The previous volume, published in 2015, systematically summarized the remarkable progress in assorted topics of organic crystal chemistry using organic solids and organic–inorganic hybrid materials during the previous 5 years, and it has been widely read. The present volume also shows the progress of organic solid chemistry in the last 5 years, with contributions mainly by invited members of the Division of Organic Crystal Chemistry of the

Chemical Society of Japan (CSJ), together with prominent invited authors from countries other than Japan.

Preparation and Crystal Structures of Chiral and Non-chiral Mixed Ligand Copper Complexes Containing N-methyl Imidazole and Various N-phthaloylalanines

Causes and Consequences

Amplification of Chirality

Enantioselective Synthesis, Enantiomeric Separations and Chiral Recognition

Nanoparticles, Surfaces, Materials and More

Caught in the Act of Formation

This 21st Century Nanoscience Handbook will be the most comprehensive, up-to-date large reference work for the field of nanoscience. Handbook of Nanophysics, by the same editor, published in the fall of 2010, was embraced as the first comprehensive reference to consider both fundamental and applied aspects of nanophysics. This follow-up project has been conceived as a necessary expansion and full update that considers the significant advances made in the field since 2010. It goes well beyond the physics as warranted

by recent developments in the field. Key Features: Provides the most comprehensive, up-to-date large reference work for the field. Chapters written by international experts in the field. Emphasises presentation and real results and applications. This handbook distinguishes itself from other works by its breadth of coverage, readability and timely topics. The intended readership is very broad, from students and instructors to engineers, physicists, chemists, biologists, biomedical researchers, industry professionals, governmental scientists, and others whose work is impacted by

nanotechnology. It will be an indispensable resource in academic, government, and industry libraries worldwide. The fields impacted by nanoscience extend from materials science and engineering to biotechnology, biomedical engineering, medicine, electrical engineering, pharmaceutical science, computer technology, aerospace engineering, mechanical engineering, food science, and beyond.

"How did life originate and why were left-handed molecules selected for its architecture?" This question of high public and interdisciplinary

scientific interest is the central theme of this book. It is widely known that in processes triggering the origin of life on Earth, the equal occurrence, the parity between left-handed amino acids and their right-handed mirror images, was violated. The balance was inevitably tipped to the left – as a result of which life's proteins today exclusively implement the left form of amino acids. Written in an engaging style, this book describes how the basic building blocks of life, the amino acids, formed. After a comprehensible introduction to stereochemistry, the author addresses the

inherent property of amino acids in living organisms, namely the preference for left-handedness. What was the cause for the violation of parity of amino acids in the emergence of life on Earth? All the fascinating models proposed by physicists, chemists and biologist are vividly presented including the scientific conflicts. The author describes the attempt to verify any of those models with the chirality module of the ROSETTA mission, a probe built and launched with the mission to land on a comet and analyse whether there are chiral organic compounds that could

have been brought to the Earth by cometary impacts. A truly interdisciplinary astrobiology book, "Amino Acids and the Asymmetry of Life" will fascinate students, researchers and all readers with backgrounds in natural sciences. With a foreword by Henri B. Kagan.

'Topics in Stereochemistry' is a successful series covering the most important advances in the field. This volume includes chapters on: Stereochemistry of Molecules in Inclusion Crystals; Torsional Motion of Stilbene-type Molecules in Crystals; and Supramolecular Networks of Porphyrins.

With contributions by numerous experts
Chirality in Drug Research
Synthesis, Concepts, Function
Prebiotic Chemistry
Mixed Crystals
Understanding Intermolecular Interactions in the Solid State

Brings together the best tested and proven stereoselective synthetic methods Both the chemical and pharmaceutical industries are increasingly dependent on stereoselective synthetic methods and strategies for the generation of new chiral drugs and

natural products that offer specific 3-D structures. With the publication of Stereoselective Synthesis of Drugs and Natural Products, researchers can turn to this comprehensive two-volume work to guide them through all the core methods for the synthesis of chiral drugs and natural products. Stereoselective Synthesis of Drugs and Natural Products features contributions from an international team of synthetic chemists and pharmaceutical and natural product researchers. These authors have reviewed the tremendous body of literature in the field in order to compile a set of reliable, tested, and proven methods alongside step-by-

step guidance. This practical resource not only explores synthetic methodology, but also reaction mechanisms and applications in medicinal chemistry and drug discovery. The publication begins with an introductory chapter covering general principles and methodologies, nomenclature, and strategies of stereoselective synthesis. Next, it is divided into three parts: Part One: General Methods and Strategies Part Two: Stereoselective Synthesis by Bond Formation including C-C bond formation C-H bond formation C-O bond formation C-N bond formation Other C-heteroatom formation and other bond formation Part

Three: Methods of Analysis and Chiral Separation References in every chapter serve as a gateway to the literature in the field. With this publication as their guide, chemists involved in the stereoselective synthesis of drugs and natural products now have a single, expertly edited source for all the methods they need.

A new volume in the "Perspectives in Supramolecular Chemistry" series focusing on separating supramolecular structures, a key step in supramolecular chemistry. Two guest editors have been at the forefront of the development of

chromatographical methods to deal with supramolecular systems. Reactions of supramolecular structures show the way into the future of chemistry. Fumio Toda is one of the driving forces in the development of supramolecular separation systems. A practical title in the prestigious "Perspectives in Supramolecular Chemistry" series.