
Crystallization Of Organic Compounds An Industrial Perspective Author Hsien Hsin Tung Published On June 2009

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Crystallization Processes in Fats and Lipid Systems
Processes, Purity and Permeability
Comprehensive Organic Chemistry Experiments for the Laboratory Classroom
Chemical Technicians' Ready Reference Handbook
Melt Crystallization Technology
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The Crystalline States of Organic Compounds

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Crystallization Kinetics in Polymorphic Organic Compounds Elsevier

Examines emerging technologies in the use of crystallization as a purification and separation process in the food, pharmaceutical, and commodity and specialty chemical industries. Discusses the application of molecular modelling and calculation chemistry to crystallization. Includes chapters focusing on crystal morphology and chirality.

Crystallization Processes in Fats and Lipid Systems Royal Society of Chemistry

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 themselves 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 multi-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.

Processes, Purity and Permeability Springer Science & Business Media

Handbook of Synthetic Organic Chemistry, Second Edition updates and expands the author's popular 2007 work, Synthetic Organic Chemist's Companion. This new handbook provides valuable, practical

guidance; incorporates corrections, and includes coverage on important topics, such as lyophilization, crystallization, precipitation, HPLC detectors, gases, and microwave reactions. The book maintains the useful organization of the author's earlier work, beginning with a basic overview and walking through every practical step of the process of organic synthesis, from reagents, solvents, and temperature control, to documentation, implementation, purification, and analytical methods for the product. From planning and setting up reactions, to recording them, the book provides insight and valuable guidance into every step of the process. Practical guidance for planning, working up, documenting, analyzing, and improving reactions in synthetic organic chemistry

Comprehensive Organic Chemistry Experiments for the Laboratory Classroom Macmillan

The first edition of this book achieved considerable success due to its ease of use and practical approach, and to the clear writing style of the authors. The preparation of organic compounds is still central to many disciplines, from the most applied to the highly academic and, more than ever is not limited to chemists. With an emphasis on the most up-to-date techniques commonly used in organic syntheses, this book draws on the extensive experience of the authors and their association with some of the world's leading laboratories of synthetic organic chemistry. In this new edition, all the figures have been re-drawn to bring them up to the highest possible standard, and the text has been revised to bring it up to date. Written primarily for postgraduate, advanced undergraduate and industrial organic chemists, particularly those involved in pharmaceutical, agrochemical and other areas of fine chemical research, the book is also a source of reference for biochemists, biologists, genetic engineers, material scientists and polymer researchers.

Chemical Technicians' Ready Reference Handbook Amer Chemical Society

"Compatible with standard taper miniscale, 14/10 standard taper microscale, Williamson microscale. Supports guided inquiry"--Cover.

Melt Crystallization Technology Beauport, Que. : C.M.I.C., [between 1981 and 1985]

The objective of this study is to better understand the relationship between organic compounds and carbonate mineral growth in different natural environments by imaging the interface between organic compounds and carbonate precipitates in ancient and modern rocks, and laboratory experiments. Three separate projects were designed to document the organic/carbonate mineral interface through imagery. 1) Images of the interfaces between organic components and initial mineral precipitates were investigated in a deteriorating microbial mat from Vermelha, Brazil that was taken from the site in 2006. As the mat deteriorated the amount of calcification increased. A section of the transitional section between living algae and calcitic precipitate was taken for analysis. Transmission Electron Microscopy (TEM) along with Energy-dispersive X-ray spectroscopy (X-EDS) showed carbonate minerals growing on cell walls and using dark, amorphous structures as nucleation points. X-EDS results showed that the dark amorphous structures have high concentrations of silica, magnesium, and oxygen, which appears to promote carbonate mineral

precipitation. 2) Laboratory experiments were designed to precipitate calcite in solution with varying organic compounds and then use TEM analysis to image the precipitants, specifically the transitional area between the organic compounds and carbonate minerals. Calcite crystals appeared to nucleate off of the surfaces of palmitic and stearic acid. X-EDS analysis verified the elemental transition from organic matter to carbonate mineral growth. 3) Cold water, authigenic carbonate rocks collected by Dr. Adam Skarke, on July 6, 2016 during the National Oceanographic Laboratory System (UNOLS) research cruise to a methane seep off the eastern North America coast were imaged and analyzed. Scanning Electron Microscope (SEM), EDS and XRD analysis were used to better understand the sequence of events that led to formation of this unusual rock. The rock grew in situ trapping quartz and metallic minerals in aragonitic cement, and then was cut and pushed apart by veins filled with aragonitic cement in a pattern reminiscent of septarian nodules.

Crystallization of Organic Molecules Onto Functionalized Surfaces Springer

An important resource that puts the focus on understanding and handling of organic crystals in drug development. Since a majority of pharmaceutical solid-state materials are organic crystals, their handling and processing are critical aspects of drug development. *Pharmaceutical Crystals: Science and Engineering* offers an introduction to and thorough coverage of organic crystals, and explores the essential role they play in drug development and manufacturing. Written contributions from leading researchers and practitioners in the field, this vital resource provides the fundamental knowledge and explains the connection between pharmaceutically relevant properties and the structure of a crystal. Comprehensive in scope, the text covers a range of topics including: crystallization, molecular interactions, polymorphism, analytical methods, processing, and chemical stability. The authors clearly show how to find solutions for pharmaceutical form selection and crystallization processes. Designed to be an accessible guide, this book represents a valuable resource for improving the drug development process of small drug molecules. This important text: Includes the most important aspects of solid-state organic chemistry and its role in drug development Offers solutions for pharmaceutical form selection and crystallization processes Contains a balance between the scientific fundamental and pharmaceutical applications Presents coverage of crystallography, molecular interactions, polymorphism, analytical methods, processing, and chemical stability Written for both practicing pharmaceutical scientists, engineers, and senior undergraduate and graduate students studying pharmaceutical solid-state materials, *Pharmaceutical Crystals: Science and Engineering* is a reference and textbook for understanding, producing, analyzing, and designing organic crystals which is an imperative skill to master for anyone working in the field.

Advanced Practical Organic Chemistry, Second Edition Routledge

Crystallization is an important separation and purification process used in industries ranging from bulk commodity chemicals to specialty chemicals and pharmaceuticals. In recent years, a number of environmental applications have also come to rely on crystallization in waste treatment and recycling processes. The authors provide an introduction to the field of newcomers and a reference to those involved in the various aspects of industrial crystallization. It is a complete volume covering all aspects of industrial crystallization, including material related to both fundamentals and applications. This new edition presents detailed material on crystallization of biomolecules,

precipitation, impurity-crystal interactions, solubility, and design. Provides an ideal introduction for industrial crystallization newcomers Serves as a worthwhile reference to anyone involved in the field Covers all aspects of industrial crystallization in a single, complete volume

Science and Engineering Amer Chemical Society

The role of specific molecular interactions in influencing the solubility behavior of organic compounds are examined, particularly the role of hydrogen bonding. Shows how specific interactions can be used to elicit preferential solubility. Emphasizes interactions occurring in environments of low polarity and explains and predicts solubility phenomena in self-associated solvents. Also considers the kinetics of diffusion and dissolution.

An Industrial Perspective Elsevier

Basic Techniques of Preparative Organic Chemistry covers a detailed guide for carrying out the procedures commonly needed in preparative organic chemistry. The book discusses the nature of organic reactions; the basic principles of preparative organic chemistry; unit operations; and good laboratory practice. The text then provides a review of apparatus and equipment and describes the potential hazards involved in a chemical operation, such as toxicity, bodily injuries, smoking, fire, explosion, and implosion. Techniques and unit operations for carrying out a reaction and for isolating and purifying a reaction product; and the criteria for and methods of assessing purity are also considered. The book further tackles packing and storing products and samples and making reports and communications. Students taking organic chemistry courses will find the text useful.

Hydrothermal Crystallization of Organic Compounds Wiley-AIChE

An exploration of new and emerging techniques, processes and applications in the behaviour, crystallization, and polymorphic transformations of fats and oils. It presents research and information on advanced analytical tools, computer modelling, molecular structures, mixing behaviour, and interactions with seeding materials and surfactants. The con

Industrial Crystallization John Wiley & Sons

Crystallization of Organic Compounds An Industrial Perspective Wiley-AIChE

Crystallization of Organic Compounds John Wiley & Sons

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.

An Industrial Perspective Springer Nature

This extensively illustrated book by Alexander McPherson, a master practitioner, accomplishes several important goals: it presents the underlying physical and chemical principles of crystallization in an approachable way; it provides the reader with a biochemical context in which to understand

and pursue successful crystal growth; it instructs the reader in practical aspects of the technologies required; and it lays out effective strategies for success that investigators can readily apply to their own experimental questions. This readable volume has been created for every investigator in biomedicine whose studies may require a shift in focus from gene to protein product, as well as chemists and physicists interested in the functions of biologically active macromolecules.

Salts of Amino Acids John Wiley & Sons

The Crystalline States of Organic Compounds, Volume 22 provides a concise, objective survey of how molecular crystals are theoretically described, modeled, and applied, covering both foundational and fast-growing areas ranging from chemical bonding and crystallographic database use, to polymorphism, co-crystallization, crystal structure prediction, and molecular dynamics simulation. Drawing on the extensive experience of its expert author, the book provides authoritative insight into the key knowledge, methods, and future directions in the field for researchers interested in crystal chemistry across academia and industry. Part 1 introduces the key information needed to understand the formation, structure, and properties of crystals in organic compounds, beginning with a guide to electron densities and chemical bonding, intermolecular bonds, and multi-molecular asymmetric units. Chapters go on to discuss organic crystal potentials, crystal polymorphism, and organic crystal nucleation, before Part 2 goes on to explore methods and approaches in more detail. X-ray analysis of crystals, crystal structure prediction from molecular structure, dynamic simulation of aggregate chemical systems, and nonconventional techniques are all discussed in detail. Distills key theoretical information and practical methods in a single resource Describes effective use of such tools as X-ray analysis, dynamic simulations, and databases Provides additional clarity through a high number of carefully selected visuals, multimedia elements and a crystallography tutorial

The Effects of Ultrasound on the Kinetics of Crystallization Elsevier

HKUST Call Number: Thesis CHEM 2006 Wong.

Handbook of Synthetic Organic Chemistry Wiley-Interscience

Since the first publication of this definitive work nearly 40 years ago, this fourth edition has been completely rewritten. Crystallization is used at some stage in nearly all process industries as a method of production, purification or recovery of solid materials. Incorporating all the recent developments and applications of crystallization technology, Crystallization gives clear accounts of the underlying principles, a review of the past and current research themes and guidelines for equipment and process design. This new edition introduces and enlarges upon such subjects as: Control and Separation of polymorphs and chiral crystals Micro- and macro-mixing and the use of computer fluid dynamics Seeding and secondary nucleation in batch crystallization processes Incorporation of upstream and downstream requirements into design procedures for crystallization plant Computer-aided molecular design and its use in crystal habit modifier selection Crystallization provides a comprehensive overview of the subject 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. Crystallization is written with the precision and clarity of style that is John Mullin's hallmark - a special feature being the large number of appendices that provide relevant physical property data. Covers all new developments and trends in crystallization

Comprehensive coverage of subject area

Crystallisation Elsevier

Industrial Crystallization Symposia have been organized by the Crystallization Research Group at the Czechoslovak Research Institute for Inorganic Chemistry, Usti nad Labem, since 1960. Over the years, the increasing popularity of the unit operation of crystallization has been clearly demonstrated by the steady increase in numbers of both the papers presented and the attendances at the meetings. The 6th Symposium (1-3 September 1975) was organized jointly with the European Federation of Chemical Engineering Working Party on Crystallization, and the 44 papers presented were arranged into four sessions - A: Secondary Nucleation, B: Crystal Growth Kinetics, C: Crystal Habit Modification, D: Crystallizer Design, E: Industrial Crystallizer Operation and Case Studies. The same groupings are preserved in this edited version of the proceedings. This is the first time that the Industrial Crystallization Symposium papers have appeared in one volume. After the 5th (1972) Symposium, authors were encouraged to submit their papers to an international journal specializing in crystallization. However, the results were not altogether satisfactory in that less than one third of the papers presented at the meeting were offered for consideration. This time, therefore, the organizing committee decided to attempt to keep the papers together by making arrangements for their publication by Plenum Press.

Handbook of Industrial Crystallization John Wiley & Sons

Filled with industrial examples emphasizing the practical applications of crystallization methodologies Based on the authors' hands-on experiences as process engineers at Merck, Crystallization of Organic Compounds guides readers through the practical aspects of crystallization. It uses plenty of case studies and examples of crystallization processes, ranging from development through manufacturing scale-up. The book not only emphasizes strategies that have been proven successful, it also helps readers avoid common pitfalls that can render standard procedures unsuccessful. The goal of this text is twofold: Build a deeper understanding of the fundamental properties of crystallization as well as the impact of these properties on crystallization process development. Improve readers' problem-solving abilities by using actual industrial examples with real process constraints. Crystallization of Organic Compounds begins with detailed discussions of fundamental thermodynamic properties, nucleation and crystal growth kinetics, process dynamics, and scale-up considerations. Next, it investigates modes of operation, including cooling, evaporation, anti-solvent, and reactive crystallization. The authors conclude with special applications such as ultrasound in crystallization and computational fluid dynamics in crystallization. Most chapters feature multiple examples that guide readers step by step through the crystallization of active pharmaceutical ingredients (APIs). With its focus on industrial applications, this book is recommended for chemical engineers and chemists who are involved with the development, scale-up, or operation of crystallization processes in the pharmaceutical and fine chemical industries.

Crystal Growth of Organic Materials CRC Press

New crystalline materials (organic, inorganic, hybrid) are promising for various applications, including electrical, piezoelectric, ferroelectric, magnetic, and catalytic processes. In addition, given their remarkable structural richness, these materials exhibit several interesting physical properties, such as ionic conduction, ion exchange, and others. Crystal growth, morphology, and grain size are

factors influencing these physical properties. This book examines methods of synthesis of the most common crystalline materials and describes nucleation and crystal growth of various materials.