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# Kristallisation in der industriellen Praxis



# Kristallisation In Der Industriellen Praxis

**Clemens Wendtner**

## **Kristallisation In Der Industriellen Praxis:**

Kristallisation in der industriellen Praxis Günter Hofmann, 2006-12-13 Bei der Herstellung von Produkten und Verbrauchsgttern in verfahrenstechnischen Produktionsanlagen ist die Kristallisation ein wesentlicher Verfahrensschritt um bei Stofftrennprozessen eine hohe Reinheit zu erzielen. Diese Stofftrennungsschritte verursachen hufig einen groen Teil der Anlagenbetriebs und Investitionskosten. Das Buch vermittelt auf klare und verstandliche Weise die Planungsgrundlagen und Beurteilungskriterien fr Kristallisierungsverfahren in der industriellen Chemie. Mit diesem Buch wird vor allem der Praktiker in der Industrie angesprochen, der sich schnell und zielgerichtet ber das Thema informieren mchte. Das Buch gibt eine generelle Einfhrung in die theoretischen Grundlagen, behandelt aber vor allem Praxisbeispiele aus der Industrie. Aus dem Inhalt: Einfhrung Gleichgewichtsdiagramme fr die Kristallisation aus Lsungen und Schmelzen, Keimbildung und Kristallwachstum, Grundlagen der technischen Kristallisation, Partikelgr enverteilung und Modellierung von Kristallisatoren, Agglomeration, Druck-Kristallisation, Diskontinuierliche Kristallisationsprozesse, Fremdstoffbeeinflussung in der Kristallisation, Verfahren und Kristallisatorbauarten fr die einfache Kristallisation aus Lsungen, Fallbeispiele ausgefhrter Anlagen, Verfahren und Apparate zur Kristallisation aus Schmelzen.

BIWIC 2006 Peter Jansens, Joop ter Horst, Shanfeng Jiang, 2006 Talks about the shift of focus from design of large continuous dedicated crystallizers to control of batch wise operated basic equipment and the attention for modeling and optimization of precipitation and anti solvent crystallization processes and a concentration on crystallization of organic molecular compounds instead of inorganic salts.

Chemical Engineering and Chemical Process Technology - Volume II Ryzhard Pohorecki, John Bridgwater, M. Molzahn, Rafiqul Gani and Crispulo Gallegos, 2010-11-30 Chemical Engineering and Chemical Process Technology is a theme component of Encyclopedia of Chemical Sciences Engineering and Technology Resources in the global Encyclopedia of Life Support Systems (EOLSS) which is an integrated compendium of twenty Encyclopedias. Chemical engineering is a branch of engineering dealing with processes in which materials undergo changes in their physical or chemical state. These changes may concern size, energy content, composition and/or other application properties. Chemical engineering deals with many processes belonging to chemical industry or related industries: petrochemical, metallurgical, food, pharmaceutical, fine chemicals, coatings and colors, renewable raw materials, biotechnological, etc. and finds application in manufacturing of such products as acids, alkalis, salts, fuels, fertilizers, crop protection agents, ceramics, glass, paper, colors, dyestuffs, plastics, cosmetics, vitamins and many others. It also plays significant role in environmental protection, biotechnology, nanotechnology, energy production and sustainable economical development. The Theme on Chemical Engineering and Chemical Process Technology deals in five volumes and covers several topics such as Fundamentals of Chemical Engineering, Unit Operations, Fluids, Unit Operations, Solids, Chemical Reaction Engineering, Process Development, Modeling, Optimization and Control, Process Management, The Future of Chemical Engineering, Chemical Engineering Education, Main Products, which are then expanded into multiple subtopics each.

as a chapter These five volumes are aimed at the following five major target audiences University and College students Educators Professional practitioners Research personnel and Policy analysts managers and decision makers and NGOs

Industrial Crystallization Process Monitoring and Control Angelo Chianese,Herman J. Kramer,2012-04-06 Crystallization is an important technique for separation and purification of substances as well as for product design in chemical pharmaceutical and biotechnological process industries This ready reference and handbook draws on research work and industrial practice of a large group of experts in the various areas of industrial crystallization processes capturing the essence of current trends the markets design tools and technologies in this key field Along the way it outlines trouble free production provides laboratory controls analyses case studies and discusses new challenges First the instrumentation and techniques used to measure the crystal size distribution the nucleation and solubility points and the chemical composition of the solid and liquid phase are outlined Then the main techniques adopted to control industrial crystallizers starting from fundamental approaches to the most advanced ones including the multivariable predictive control are described An overview of the main crystallizer types is given with details of the main control schemes adopted in industry as well as the more suitable sensors and actuators

*Handbook of Continuous Crystallization* Nima Yazdanpanah,Zoltan K Nagy,2020-02-04 Continuous crystallization is an area of intense research with particular respect to the pharmaceutical industry and fine chemicals Improvements in continuous crystallization technologies offer chemical industries significant financial gains through reduced expenditure and operational costs and consistent product quality Written by well known leaders in the field The Handbook of Continuous Crystallization presents fundamental and applied knowledge with attention paid to application and scaling up and the burgeoning area of process intensification Beginning with concepts around crystallization techniques and control strategies the reader will learn about experimental methods and computational tools Case studies spanning fine and bulk chemicals the pharmaceutical industry and employing new mathematical tools put theory into context

**Crystallization** Wolfgang Beckmann,2013-01-14 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

**Advances in Industrial Crystallization** Heike Lorenz,Erik Temmel,2021-06-15 This Special Issue is result of a call for papers of the Section Industrial Crystallization of MDPI s scientific journal Crystals It addresses scientists and engineers active in research and process product development in life science industries e g pharmaceuticals fine chemicals and biotechnology products and bulk chemical applications e g desalination as well The contributions comprise several fundamental and application oriented facets of crystallization providing an overview of industrially relevant subjects in the field Main issues cover phase equilibria and solid state behavior of crystalline compounds crystal shape and size and related measurement techniques Melt and solution crystallization are considered specifically addressing contemporary aspects of continuous crystallization and process intensification

**Alternatives to Conventional Food Processing 2nd Edition** Andrew Proctor,2018-01-17 This updated edition provides a review of the current major technologies that reduce energy cost and reduce environmental impact while maintaining food safety and quality

**Thermal Separation Technology** Alfons Mersmann,Matthias Kind,Johann Stichlmair,2011-07-28 Thermal Separation Technology is a key discipline for many industries and lays the engineering foundations for the sustainable and economic production of high quality materials This book provides fundamental knowledge on this field and may be used both in university teaching and in industrial research and development Furthermore it is intended to support professional engineers in their daily efforts to improve plant efficiency and reliability Previous German editions of this book have gained widespread recognition This first English edition will now make its content available to the international community of students and professionals In the first chapters of the book the fundamentals of thermodynamics heat and mass transfer and multiphase flow are addressed Further chapters examine in depth the different unit operations distillation and absorption extraction evaporation and condensation crystallization adsorption and chromatography and drying while the closing chapter provides valuable guidelines for a conceptual process development

**International Conference on Nutrient Recovery From Wastewater Streams Vancouver, 2009** Ken Ashley,Don Mavinic,Fred Koch,2009-04-30 Paperback CD ROM Closing the loop for nutrients in wastewaters municipal sewage animal wastes food industry commercial and other liquid waste streams is a necessary

sustainable development objective to reduce resource consumption and greenhouse gas emissions Chemistry engineering and process integration understanding are all developing quickly as new processes are now coming online A new paradigm is emerging globally Commercial marketing of recovered nutrients as green fertilizers or recycling of nutrients through biomass production to new outlets such as bioenergy is becoming more widespread This exciting conference brings together various waste stream industries regulators researchers process engineers and commercial managers to develop a broad based intersectional understanding and joint projects for phosphorus and nitrogen recovery from wastewater streams as well as reuse Over 90 papers from over 30 different countries presented in this volume This conference is sponsored by Metro Vancouver Global Phosphate Forum Stantec Consulting Ltd The Chartered Institution of Water and Environmental Management CIWEM Ostara Nutrient Recovery Technologies Inc ONRTI The University of British Columbia UBC The United States Environmental Protection Agency EPA The British Columbia Water and Wastewater Association BCWWA The Canadian Society for Civil Engineering CSCE The Ostara Research Foundation ORF *Solid State Development and Processing of Pharmaceutical Molecules* Michael Gruss,2021-08-31 Solid State Development and Processing of Pharmaceutical Molecules A guide to the latest industry principles for optimizing the production of solid state active pharmaceutical ingredients Solid State Development and Processing of Pharmaceutical Molecules is an authoritative guide that covers the entire pharmaceutical value chain The authors noted experts on the topic examine the importance of the solid state form of chemical and biological drugs and review the development production quality control formulation and stability of medicines The book explores the most recent trends in the digitization and automation of the pharmaceutical production processes that reflect the need for consistent high quality It also includes information on relevant regulatory and intellectual property considerations This resource is aimed at professionals in the pharmaceutical industry and offers an in depth examination of the commercially relevant issues facing developers producers and distributors of drug substances This important book Provides a guide for the effective development of solid drug forms Compares different characterization methods for solid state APIs Offers a resource for understanding efficient production methods for solid state forms of chemical and biological drugs Includes information on automation process control and machine learning as an integral part of the development and production workflows Covers in detail the regulatory and quality control aspects of drug development Written for medicinal chemists pharmaceutical industry professionals pharma engineers solid state chemists chemical engineers Solid State Development and Processing of Pharmaceutical Molecules reviews information on the solid state of active pharmaceutical ingredients for their efficient development and production *Modern Methods in Crop Protection Research* Peter Jeschke,Wolfgang Krämer,Ulrich Schirmer,Matthias Witschel,2013-02-05 This handbook and ready reference highlights a couple of basic aspects of recently developed new methods in modern crop protection research authored by renowned experts from major agrochemical companies Organized into four major parts that trace the key phases

of the compound development process the first section addresses compound design while the second covers newly developed methods for the identification of the mode of action of agrochemical compounds The third part describes methods used in improving the bioavailability of compounds and the final section looks at modern methods for risk assessment As a result the agrochemical developer will find here a valuable toolbox of advanced methods complete with first hand practical advice and copious examples from current industrial practice     Stoffübergangsprozesse der chemischen Technologie P. G.

Romankov,N. B. Raškovskaja,V. F. Frolov,1979-12-31 Keine ausf hrliche Beschreibung f r Stoff bergangsprozesse der chemischen Technologie verf gbar     **Fluidverfahrenstechnik** Ralf Goedecke,2008-11-21 Von Praktikern f r Praktiker geschrieben erl utert das vorliegende Werk die prozesstechnische Behandlung von Fl ssigkeits und Gasgemischen zur Reinigung Auftrennung und Aufkonzentrierung der einzelnen Komponenten durch den Einsatz selektiver Trenntechniken Absorption Rektifikation Verdampfung Kondensation Extraktion Adsorption Chromatographie Membrantechnik Schmelzkristallisation Trenntechnik mit berkritischen Fluiden Alle zum Verst ndnis der Unit Operations notwendigen Grundlagen aus den Bereichen Thermodynamik W rme und Stoff bertragung Str mungslehre sowie zu Grenzfl chenvorg ngen sind in dem Buch enthalten Neu ist die umfassende Darstellung der Synthese fluidverfahrenstechnischer Prozesse von der Idee bis zur praktischen Anwendung In diesem Zusammenhang werden Aspekte wie Miniplanttechnologie Prozesssynthese und simulation erl utert Auch so wichtige Probleme wie Einbauten Scale up und Fouling werden angesprochen Um all diesen Anforderungen dem aktuellen Stand der Technik entsprechend gerecht zu werden haben bei dem Buch namhafte Autoren aus Industrie und Wissenschaft zusammengearbeitet Aufgrund der breit gef cherten Thematik wendet sich das Buch gleicherma en an Planungs und Betriebsingenieure wie an Neueinsteiger und Hochschulabg nger die Grundlagenwissen in die Praxis umsetzen wollen     **Kristallisation in der industriellen Praxis** G nter Hofmann,2004-06-25 Bei der Herstellung von Produkten und Verbrauchsg tern in verfahrenstechnischen Produktionsanlagen ist die Kristallisation ein wesentlicher Verfahrensschritt um bei Stofftrennprozessen eine hohe Reinheit zu erzielen Diese Stofftrennungsschritte verursachen h ufig einen gro en Teil der Anlagenbetriebs und Investitionskosten Das Buch vermittelt auf klare und verstandliche Weise die Planungsgrundlagen und Beurteilungskriterien f r Kristallisierungsverfahren in der industriellen Chemie Mit diesem Buch wird vor allem der Praktiker in der Industrie angesprochen der sich schnell und zielgerichtet ber das Thema informieren m chte Das Buch gibt eine generelle Einf hrung in die theoretischen Grundlagen behandelt aber vor allem Praxisbeispiele aus der Industrie Aus dem Inhalt Einf hrung Gleichgewichtsdiagramme f r die Kristallisation aus L sungen und Schmelzen Keimbildung und Kristallwachstum Grundlagen der technischen Kristallisation Partikelgr enverteilung und Modellierung von Kristallisatoren Agglomeration Druck Kristallisation Diskontinuierliche Kristallisierungsprozesse Fremdstoffbeeinflussung in der Kristallisation Verfahren und Kristallisatorbauarten f r die einfache Kristallisation aus L sungen Fallbeispiele ausgef hrter Anlagen Verfahren und Apparate zur Kristallisation aus Schmelzen     **Kleinskalige**

*Charakterisierung der Fest-Flüssig-Trennung und Betrachtung des Scherbruchs von Proteinkristallen* Radel, Benjamin,2022-11-11 Proteine sind aus Aminosäuren aufgebaute Makromoleküle die für eine Vielzahl biologischer Stoffwechselvorgänge essenziell sind. Auch in der technischen Anwendung kommen Proteine beispielsweise zur Katalyse von Reaktionen zum Einsatz. Ziel dieser Arbeit ist es bereits früh in der Prozessentwicklung eine Aussage zur Filterbarkeit zu ermöglichen. Eine in dieser Arbeit entwickelte Filtrationszelle für eine Zentrifuge ermöglicht es die Filtration in einem kleinen Maßstab zu charakterisieren. Proteins are macromolecules composed of amino acids that are essential for a large number of biological metabolic processes. Proteins are also used in technical applications for example to catalyze reactions. The objective of this work is to provide an indication of filterability early in the process development. A filtration cell for a centrifuge developed in this work makes it possible to characterize filtration on a small scale.

### **Thermische Verfahrenstechnik**

Alfons Mersmann, Matthias Kind, Johann Stichlmair, 2006-03-30 Die Neuauflage hilft am besten und anerkannten Konzept der Vorauflage fest ein Grundlagenwerk zum Einsatz in der universitären Lehre aber vor allem ein Nachschlagewerk für den Beruf zum tieferen Verständnis der verfahrenstechnischen Zusammenhänge. Gegenüber der Vorauflage wurde das Werk allerdings erheblich erweitert sowie durch aktuelle Forschungsergebnisse und ein Kapitel zur konzeptuellen Prozessentwicklung ergänzt. Die Grundverfahren werden auf der Basis der Thermodynamik der Wärme und Stoffübertragung und der Fluidodynamik dargestellt. Damit erhält der Praktiker erste Informationen über die Auswahl, die Auslegung und den Betrieb von Apparaten. Nach einer komprimierten Darstellung wichtiger Grundlagen werden unter anderem Destillieren, Rektifikation, Absorption, Kristallisation und Adsorption behandelt. Es wird aufgezeigt, wie sich grundlagenorientierte Berechnungsansätze für fluidodynamische und kinetische Vorgänge in bekannten und neuen Apparaten finden lassen.

Nachrichten aus der Chemie, 2004 **Technische Chemie** Manfred Baerns, Arno Behr, Axel Brehm, Jürgen Gmehling, Kai-Olaf Hinrichsen, Hanns Hofmann, Michael Kleiber, Norbert Kockmann, Ulfert Onken, Regina Palkovits, Albert Renken, Dieter Vogt, 2023-03-13 Das grundlegende Lehrbuch der Technischen Chemie mit hohem Praxisbezug in der dritten Auflage beschreibt didaktisch und gelungen die Bereiche chemische Reaktionstechnik, Grundoperationen, Verfahrensentwicklung sowie chemische Prozesse. Alle Kapitel wurden komplett bearbeitet und aktualisiert, zahlreiche Fragen als Zusatzmaterial für Studenten online auf Wiley VCH erhältlich. Unterstützt das Lernen durch zahlreiche im Text eingestreute Rechenbeispiele inklusive Lösungen neben einem grundlegenden chemischen Verständnis und Grundkenntnissen der Physikalischen Chemie und Mathematik. Kein Spezialwissen voraus. NEU: Neue Technologien und Rohstoffe relevant für moderne industrielle Prozesse. Ideal für Studierende der Chemie des Chemieingenieurwesens und der Verfahrenstechnik in Bachelor und Masterstudiengängen.

Industrielle Keramik Felix Singer, Sonja S. Singer, 2013-07-02 ab

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