
Freeze Drying And Lyophilization Of Pharmaceutical And Biological Products Drugs And The Pharmaceutical Sciences

Cryopreservation and Freeze-Drying Protocols
New Technologies and Approaches
Freeze-Drying of Pharmaceutical and Food Products
Nanobiomaterials in Soft Tissue Engineering
Production, Processing and Food Applications
Freeze-Drying/Lyophilization of Pharmaceutical and Biological Products, Third Edition
Handbook of Drying for Dairy Products
Lyophilization
Encyclopedia of Pharmaceutical Technology Third Edition (Print/on
Proceedings of a Symposium
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Processes and Properties
Handbook of Downstream Processing
Development of Biopharmaceutical Drug-Device Products

Drying Technologies for Biotechnology and Pharmaceutical Applications
A Companion Guide for the ASME BPE Standard
Freeze-Drying/Lyophilization Of Pharmaceutical & Biological Products, Second Edition, Revised and Expanded
Bioprocessing Piping and Equipment Design
An Engineering Perspective
Freeze-drying/Lyophilization of Pharmaceutical and Biological Products
Compendium of Biomedical Instrumentation, 3 Volume Set
Applications of Nanobiomaterials
Fundamentals of Freeze-drying
Ice Templating and Freeze-Drying for Porous Materials and Their Applications
Freeze-Drying
Freeze Drying of Pharmaceutical Products
Good Pharmaceutical Freeze-Drying Practice
Identification and Quantification of Heterogeneity in Freezing and Primary Drying Steps of Lyophilization
Freeze Drying (lyophilization) of Leukocytes for Gene Banking and Nuclear Transfer Technology
Lyophilization of Biopharmaceuticals
Insects as Sustainable Food Ingredients
Protein Purification Protocols

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Cryopreservation and Freeze-Drying Protocols Elsevier
Comprehensive Assessment of This Globally Relevant Practice As
a centuries-old food preservation method, dehydration
technology has advanced significantly in the past decades as a
result of new methods, sophisticated analytical techniques, and

improved mathematical modeling. Providing practical and expert
insight from an international panel of experts, *Advances in Food
Dehydration* encompasses these revolutionary advances and
effectively supplies the knowledge base required to optimize
natural resources and reduce energy requirements in order to
meet growing demand for low-cost, high-quality food products.
Discusses Ways to Best Optimize Natural Resources Under the
editorial guidance of food engineering and dehydration authority
Cristina Ratti, this resource addresses the three biggest
challenges associated with food dehydration: The complex nature

of food systems together with the deep structural and physico-chemical changes that foodstuffs undergo during processing. The difficulty to define quality in quantitative terms and to develop appropriate control techniques. The lack of realistic models and simulations to represent the phenomena. The book's well-developed chapters explain the structural and physico-chemical changes that food undergoes during dehydration, while discussing ways to optimize natural resources. In addition to describing non-convective heating sources such as microwaves, infrared, and radio frequency, the text also examines the impact of drying on nutraceutical compounds, the bases of rehydration of dry food particles and the stresses on microorganisms during drying and their stability during storage. *Advances in Food Dehydration* is a user-friendly volume that concisely links the gamut of dehydration concepts into one cohesive reference. About the Editor: Cristina Ratti, Ph.D., is a food engineering professor in the Soils and Agri-Food Engineering Department at the Université Laval (Quebec). She is the coordinator of the Food Engineering Program and a member of the Institute of Nutraceutical and Functional Foods (INAF). She has published numerous scientific manuscripts related to her research interests in food dehydration as well as physicochemical and quality properties of foodstuffs related to drying.

New Technologies and Approaches Elsevier

Freeze-drying, or lyophilization, is a well established technology used in the preservation of numerous pharmaceutical and biological products. This highly effective dehydration method involves the removal of water from frozen materials via the direct sublimation of ice. In recent years, this process has met with

many changes, as have the regulations that impact lyophilization practices. This volume addresses these changes with revised chapters on emerging developments in lyophilization technology, research, and industry procedures. Providing both a scientific and industrial perspective, this comprehensive text is a valuable resource for all those who use freeze-drying technology.

Freeze-Drying of Pharmaceutical and Food Products Humana Press

The only comprehensive and authoritative reference guide to the ASME Bioprocessing Piping and Equipment (BPE) standard. This is a companion guide to the ASME Bioprocessing Piping and Equipment (BPE) Standard and explains what lies behind many of the requirements and recommendations within that industry standard. Following an introductory narrative to the Standard's early history, industry related codes and standards are explained; the design and engineering aspects cover construction materials, both metallic and nonmetallic; then components, fabrication, assembly and installation of piping systems are explored. Examination, Inspection and Testing then precede the ASME BPE certification process, concluding with a discussion on system design. The author draws on many years' experience and insights from first-hand involvement in the field of industrial piping design, engineering, construction, and management, which includes the bioprocessing industry. The reader will learn why dimensions and tolerances, process instrumentation, and material selection play such an integral part in the manufacture of components and instrumentation. This easy to understand and navigate guide will assist engineers (design, piping, chemical, etc.) who need to understand the basis for much of the

Standard's content, as do the contractors and inspectors who have to meet and validate compliance with the BPE Standard.

Nanobiomaterials in Soft Tissue Engineering Royal Society of Chemistry

This completely updated and enlarged third edition of the classic text adopts a practical approach to describe the fundamentals of freeze-drying, backed by many explanatory examples. Following an introduction to the fundamentals, the book goes on to discuss process and plant automation as well as methods to transfer pilot plant qualifications and process data to production. An entire section is devoted to a large range of different pharmaceutical, biological, and medical products. New to this edition are chapters on antibodies, freeze-dry microscopy, TEMPRIS, microwave freeze-drying, spray freeze-drying, and PAT. Their many years of experience in freeze-drying enable the authors to supply valuable criteria for the selection of laboratory, pilot and production plants, discussing the advantages, drawbacks and limitations of different plant designs. Alongside guidelines for the evaluation and qualification of plants and processes, the author also includes a troubleshooting section.

Production, Processing and Food Applications CRC Press

Thoroughly acquainting the reader with freeze-drying fundamentals, *Freeze-Drying/Lyophilization of Pharmaceutical and Biological Products, Second Edition* carves practical guidelines from the very latest theoretical research, technologies, and industrial procedures. It delineates the best execution of steps from closure preparation and regulatory control of products to equipment sterilization and process validation. With 13 new chapters providing state-of-the-art information, the book unveils

innovations currently advancing the field, including LYOGUARD® packaging for bulk freeze-drying and the irradiation of pharmaceutical and biological products.

Freeze-Drying/Lyophilization of Pharmaceutical and Biological Products, Third Edition John Wiley & Sons

Filling a gap in the literature, this is the first book to focus on the fabrication of functional porous materials by using ice templating and freeze drying. Comprehensive in its scope, the volume covers such techniques as the fabrication of porous polymers, porous ceramics, biomimic strong composites, carbon nanostructured materials, nanomedicine, porous nanostructures by freeze drying of colloidal or nanoparticle suspensions, and porous materials by combining ice templating and other techniques. In addition, applications for each type of material are also discussed. Of great benefit to those working in the freeze-drying field and researchers in porous materials, materials chemistry, engineering, and the use of such materials for various applications, both in academia and industry.

Handbook of Drying for Dairy Products Springer Nature

Many modern pharmaceutical and biological products, e.g. blood derivatives, vaccines, cytostatic drugs, antibiotics, bacteria cultures but also consumer goods such as soluble coffee are freeze-dried to transform perishable substances into a form that can be stored and reconstituted to their almost original state without loss of quality. The book describes the up-to-date fundamentals of freeze-drying, not just presenting the process in all its seven steps theoretically, but explaining it with many practical examples. Many years of experience in freeze-drying allow the authors to supply valuable criteria for the selection of

laboratory, pilot and production plants, discussing the advantages, drawbacks and limitations of different plant designs. In this second, completely revised edition, process and plant automation are introduced in a separate section and methods to transfer pilot plant qualifications and process data to production are presented. The guidelines for process and plant evaluation and qualifications have been updated and enlarged. Trouble shooting is concentrated in a section of its own and literature has been updated with 100 new quotations to include references as recent as 2002, and 100 new tables and figures have been added.

Lyophilization CRC Press

Freeze-drying, or lyophilization, is a well established technology used in the preservation of numerous pharmaceutical and biological products. This highly effective dehydration method involves the removal of water from frozen materials via the direct sublimation of ice. In recent years, this process has met with many changes, as have the regulatio

Encyclopedia of Pharmaceutical Technology Third Edition

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The field of medical instrumentation is inter-disciplinary, having interest groups both in medical and engineering professions. The number of professionals associated directly with the medical instrumentation field is increasing rapidly due to intensive penetration of medical instruments in the health care sector. In addition, the necessity and desire to know about how instruments work is increasingly apparent. Most dictionaries/encyclopedias do not illustrate properly the details of the bio-medical instruments which can add to the knowledge base of the person on those

instruments. Often, the technical terms are not covered in the dictionaries. Unless there is a seamless integration of the physiological bases and engineering principles underlying the working of a wide variety of medical instruments in a publication, the curiosity of the reader will not be satisfied. The purpose of this book is to provide an essential reference which can be used both by the engineering as well as medical communities to understand the technology and applications of a wide range of medical instruments. The book is so designed that each medical instrument/ technology will be assigned one or two pages, and approximately 450 medical instruments are referenced in this edition.

Proceedings of a Symposium CRC Press

Handbook of Drying for Dairy Products is a complete guide to the field's principles and applications, with an emphasis on best practices for the creation and preservation of dairy-based food ingredients. Details the techniques and results of drum drying, spray drying, freeze drying, spray-freeze drying, and hybrid drying Contains the most up-to-date research for optimizing the drying of dairy, as well as computer modelling options Addresses the effect of different drying techniques on the nutritional profile of dairy products Provides essential information for dairy science academics as well as technologists active in the dairy industry Freeze-Drying/Lyophilization of Pharmaceutical and Biological Products CRC Press

A comprehensive source of information about modern drying technologies that uniquely focus on the processing of pharmaceuticals and biologicals Drying technologies are an indispensable production step in the pharmaceutical industry and

the knowledge of drying technologies and applications is absolutely essential for current drug product development. This book focuses on the application of various drying technologies to the processing of pharmaceuticals and biologicals. It offers a complete overview of innovative as well as standard drying technologies, and addresses the issues of why drying is required and what the critical considerations are for implementing this process operation during drug product development. *Drying Technologies for Biotechnology and Pharmaceutical Applications* discusses the state-of-the-art of established drying technologies like freeze- and spray- drying and highlights limitations that need to be overcome to achieve the future state of pharmaceutical manufacturing. The book also describes promising next generation drying technologies, which are currently used in fields outside of pharmaceuticals, and how they can be implemented and adapted for future use in the pharmaceutical industry. In addition, it deals with the generation of synergistic effects (e.g. by applying process analytical technology) and provides an outlook toward future developments. -Presents a full technical overview of well established standard drying methods alongside various other drying technologies, possible improvements, limitations, synergies, and future directions -Outlines different drying technologies from an application-oriented point of view and with consideration of real world challenges in the field of drug product development -Edited by renowned experts from the pharmaceutical industry and assembled by leading experts from industry and academia *Drying Technologies for Biotechnology and Pharmaceutical Applications* is an important book for pharmaceutical engineers, process engineers, chemical engineers, and others

who work in related industries.

Freeze-drying of Pharmaceuticals and Biopharmaceuticals CRC Press LLC

Humans have been experimenting with lyophilization, or freeze-drying, as a method to preserve biological structures for over a thousand years. This comprehensive volume, intended for scientists in both academia and industry, covers a wide range of topics relevant to the formulation of peptide and protein drugs in the freeze-dried state.

Handbook of Food Powders CRC Press

In this new edition of the very successful *Protein Purification Protocols* (1996), Paul Cutler completely updates the existing protocols to reflect recent advances and adds an enormous new array of proteomic techniques for protein isolation and analysis. These cutting-edge techniques include not only two-dimensional gel electrophoresis for analysis and characterization, but also analytical chromatography for multidimensional separations of proteins and peptides, and mass spectrometry for isolating proteins. With the many recent advances in technology, simple spectrometric detection is no longer the only option for separating proteins, and the authors treat in full detail all the newer methods for these separations. Comprehensive and highly practical, *Protein Purification Protocols, Second Edition*, brings together all the key methodologies that both novice and experienced investigators need to carry out successful experimental work on proteins and their functions today. CRC Press

Many food ingredients are supplied in powdered form, as reducing water content increases shelf life and aids ease of

storage, handling and transport. Powder technology is therefore of great importance to the food industry. The Handbook of food powders explores a variety of processes that are involved in the production of food powders, the further processing of these powders and their functional properties. Part one introduces processing and handling technologies for food powders and includes chapters on spray, freeze and drum drying, powder mixing in the production of food powders and safety issues around food powder production processes. Part two focusses on powder properties including surface composition, rehydration and techniques to analyse the particle size of food powders. Finally, part three highlights speciality food powders and includes chapters on dairy powders, fruit and vegetable powders and coating foods with powders. The Handbook of food powders is a standard reference for professionals in the food powder production and handling industries, development and quality control professionals in the food industry using powders in foods, and researchers, scientists and academics interested in the field. Explores the processing and handling technologies in the production of food powders Examines powder properties, including surface composition, shelf life, and techniques used to examine particle size Focusses on speciality powders such as dairy, infant formulas, powdered egg, fruit and vegetable, and culinary and speciality products

Lyophilization (freeze Drying) in the Food Industry John Wiley & Sons

Freeze-drying, or lyophilization, is a well established technology used in the preservation of numerous pharmaceutical and biological products. This highly effective dehydration method

involves the removal of water from frozen materials via the direct sublimation of ice. In recent years, this process has met with many changes, as have the regulations that impact lyophilization practices. This volume addresses these changes with revised chapters on emerging developments in lyophilization technology, research, and industry procedures. Providing both a scientific and industrial perspective, this comprehensive text is a valuable resource for all those who use freeze-drying technology.

Freeze Drying Or Lyophilization John Wiley & Sons

This widely expanded second edition offers a compilation of robust, reproducible techniques for the conservation of a wide range of biological materials. It includes novel approaches and protocols that were not preservable when the first edition was published. The book begins with a discussion of long term ex situ conservation of biological resources, the role of biological resource centers, and fundamental principles of freeze-drying and cryopreservation. Each chapter focuses on the preservation of specific biological materials, including proteins, microorganisms, cell lines, and multicellular structures.

Encapsulation Technologies and Delivery Systems for Food Ingredients and Nutraceuticals CRC Press

Freeze-drying is an important preservation technique for heat-sensitive pharmaceuticals and foods. Products are first frozen, then dried in a vacuum at low temperature by sublimation and desorption, rather than by the application of heat. The resulting items can be stored at room temperature for long periods. This informative text addresses both principles and practice in this area. The first chapter introduces freeze-drying. The authors then review the fundamentals of the technique, heat-mass transfer

analyses, modelling of the drying process and the equipment employed. Further chapters focus on freeze-drying of food, freeze-drying of pharmaceuticals and the protective agents and additives applied. The final chapter covers the important subjects of disinfection, sterilization and process validation. Freeze-drying of pharmaceutical and food products is an essential reference for food, pharmaceutical and refrigeration engineers and scientists with an interest in preservation techniques. It will also be of use to students in these fields. Addresses the principles and practices used in this important preservation technique Explains the fundamentals of heat-mass transfer analysis, modelling and the equipment used Discusses the importance of disinfection, sterilization and process validation

Acceleration and Automation of Solid Sample Treatment Springer Science & Business Media

Finding consistent, analytical discussions of processes and principles of lyophilization can be challenging and often frustrating. The first resource to gather information about the field, *Lyophilization: Introduction and Basic Principles* is still the book to have on lyophilization. Presenting information in an easy-to-read style, the book comprehensively and authoritatively covers the field. Using plain, unpretentious language, author Thomas A. Jennings pulls together information from diverse sources to provide an authoritative compendium of the lyophilization process and its basic principles. He provides important discussions about the nature of the container-closure system and the equipment, tools, and environments required. Case studies and examples of solutions illustrate the many ways problems can be addressed in the lyophilization process. The

book covers: Properties of lyophilized materials Product formulation requirements and the thermal properties of formulations Importance of process water Phase changes Thermal analytical methods Freezing, primary, and secondary drying processes Effect of vacuum freeze-dryers, both now and in the future Including over 150 illustrations, global symbols, and more than 350 references, this book is the complete guide to lyophilization, its analytical methods, measurement of process parameters, and equipment.

Freeze-drying of Foods John Wiley & Sons

The biotechnology/biopharmaceutical sector has tremendously grown which led to the invention of engineered antibodies such as Antibody Drug Conjugates (ADCs), Bispecific T-cell engager (BITES), Dual Variable Domain (DVD) antibodies, and fusion proteins that are currently being used as therapeutic agents for immunology, oncology and other disease conditions. Regulatory agencies have raised the bar for the development and manufacture of antibody-based products, expecting to see the use of Quality by Design (QbD) elements demonstrating an in-depth understanding of product and process based on sound science. Drug delivery systems have become an increasingly important part of the therapy and most biopharmaceuticals for self-administration are being marketed as combination products. A survey of the market indicates that there is a strong need for a new book that will provide “one stop shopping” for the latest information and knowledge of the scientific and engineering advances made over the last few years in the area of biopharmaceutical product development. The new book entitled *Development of Biopharmaceutical Drug Device Products* is a

reference text for scientists and engineers in the biopharmaceutical industry, academia or regulatory agencies. With insightful chapters from experts in the field, this new book reviews first principles, covers recent technological advancements and provides case studies and regulatory strategies relating to the development and manufacture of antibody-based products. It covers topics such as the importance of early preformulation studies during drug discovery to influence molecular selection for development, formulation strategies for new modalities, and the analytical techniques used to characterize them. It also addresses important considerations for later stage development such as the development of robust formulations and processes, including process engineering and modeling of manufacturing unit operations, the design of analytical comparability studies, and characterization of primary containers (pre-filled syringes and vials). Finally, the latter half of the book reviews key considerations to ensure the development and approval of a patient-centered delivery system design. This involves the evolving regulatory framework with perspectives from both the US and EU industry experts, the role of international standards, design control/risk management, human factors and its importance in the product development and regulatory approval process, as well as review of the risk-based approach to bridging between devices used in clinical trials and the to-be-marketed device. Finally, case studies are provided throughout. The typical readership would have biology and/or engineering degrees and would include researchers, scientific leaders, industry specialists and technology developers working in the biopharmaceutical field.

Processes and Properties John Wiley & Sons

Insects as Sustainable Food Ingredients: Production, Processing and Food Applications describes how insects can be mass produced and incorporated into our food supply at an industrial and cost-effective scale, providing valuable guidance on how to build the insect-based agriculture and the food and biomaterial industry. Editor Aaron Dossey, a pioneer in the processing of insects for human consumption, brings together a team of international experts who effectively summarize the current state-of-the-art, providing helpful recommendations on which readers can build companies, products, and research programs. Researchers, entrepreneurs, farmers, policymakers, and anyone interested in insect mass production and the industrial use of insects will benefit from the content in this comprehensive reference. The book contains all the information a basic practitioner in the field needs, making this a useful resource for those writing a grant, a research or review article, a press article, or news clip, or for those deciding how to enter the world of insect based food ingredients. Details the current state and future direction of insects as a sustainable source of protein, food, feed, medicine, and other useful biomaterials Provides valuable guidance that is useful to anyone interested in utilizing insects as food ingredients Presents insects as an alternative protein/nutrient source that is ideal for food companies, nutritionists, entomologists, food entrepreneurs, and athletes, etc. Summarizes the current state-of-the-art, providing helpful recommendations on building companies, products, and research programs Ideal reference for researchers, entrepreneurs, farmers, policymakers, and anyone interested in insect mass

production and the industrial use of insects Outlines the challenges and opportunities within this emerging industry

Best Sellers - Books :

- [Icebreaker: A Novel \(the Maple Hills Series\)](#)
- [Bluey And Bingo's Fancy Restaurant Cookbook: Yummy Recipes, For Real Life By Penguin Young Readers Licenses](#)
- [Remarkably Bright Creatures: A Read With Jenna Pick](#)
- [Are You There God? It's Me, Margaret. By Judy Blume](#)
- [A Court Of Thorns And Roses Paperback Box Set \(5 Books\)](#)
- [Happy Place By Emily Henry](#)
- [The Woman In Me](#)
- [Our Class Is A Family \(our Class Is A Family & Our School Is A Family\)](#)
- [Young Forever: The Secrets To Living Your Longest, Healthiest Life \(the Dr. Hyman Library, 11\)](#)
- [Fast Like A Girl: A Woman's Guide To Using The Healing Power Of Fasting To Burn Fat, Boost Energy, And Balance Hormones](#)