Bioseparations Belter Solutions  | b4ec29dbdb869d966cd7a7b3106f286e

McGraw-Hill Encyclopedia of Science & Technology

Bioseparations Belter Solutions

The Handbook of Membrane Separations: Chemical, Pharmaceutical, and Biotechnological Applications provides detailed information on membrane separation technologies as they have evolved over the past decades. To provide a basic understanding of membrane technology, this book documents the developments dealing with these technologies. It explores chemical, pharmaceutical, food processing and biotechnological applications of membrane processes ranging from selective separation to solvent and material recovery. This text also presents in-depth knowledge of membrane separation mechanisms, transport models, membrane permeability computations, membrane types and modules, as well as membrane reactors.

Encyclopedia of Food Microbiology

Adsorption promises to play an integral role in several future energy and environmental technologies, including hydrogen storage, CO removal for fuel cell technology, desulfurization of oil transport fuels, and technologies for meeting higher standards on air and water pollutants. Ralph Yang’s Adsorbents provides an agile and comprehensive approach to a wide range of adsorption technologies.
source of knowledge for all commercial and new sorbent materials, presenting the fundamental principles for their syntheses, their adsorption properties, and their present and potential applications for separation and purification. Chapter topics in this authoritative, forward-looking volume include: - Formulas for calculating the basic forces or potentials for adsorption - Calculation of pore-size distribution from a single adsorption isotherm - Rules for sorbent selection - Fundamental principles for syntheses/preparation, adsorption properties, and applications of commercially available sorbents - Mesoporous molecular sieves and zeolites — complexation sorbents and their applications - Carbon nanotubes, pillared clays, and polymeric resins Yang covers the explosion in the development of new nanoporous materials thoroughly, as the adsorption properties of some of these materials have remained largely unexplored. The whole of this book benefits from the new adsorbent designs made possible by the increase in desktop computing and molecular simulation, making adsorbents useful to both practicing laboratories and graduate programs. Ralph Yang's comprehensive study contributes significantly to the resolution of separation and purification problems by adsorption technologies.

**Molecular Biology and Biotechnology**

This text is intended to provide students with a solid grounding in basic principles of biochemical engineering. Beginning with a historical review and essential concepts of biochemical engineering in part I, the next three parts are devoted to a comprehensive discussion of various topics in the areas of life sciences, kinetics of biological reactions and engineering principles. Having described the different building blocks of life, microbes, metabolism and bioenergetics, the book proceeds to explain enzymatic kinetics and kinetics of cell growth and product formation. The engineering principles cover transport phenomena in bioprocess systems and various bioreactors, downstream processing and environmental technology. Finally, the book concludes with an introduction to recombinant DNA technology. This textbook is designed for B.Tech. courses in biotechnology, B.Tech. courses in chemical engineering and other allied disciplines, and M.Sc. courses in biotechnology.

**Biochemical Engineering, Second Edition**

This systematically organized and well-balanced book compresses within the covers of a single volume the theoretical principles and techniques involved in bio-separations, also called downstream processing. These techniques are derived from a range of subjects, for example, physical chemistry, analytical chemistry, bio-chemistry, biological science and chemical engineering. Organized in its 15 chapters, the text covers in the first few chapters topics related to chemical engineering unit operations such as filtration, centrifugation, adsorption, extraction and membrane separation as applied to bioseparations. The use of chromatography as practiced at laboratory as well as industrial scale operation and related techniques such as gel filtration, affinity and pseudoaffinity chromatography, ion-exchange chromatography, electrophoresis and related methods have been discussed. The important applications of these techniques have also been highlighted.

**Bioanalytical Techniques**

**Annual Conference Proceedings**

Promoting a continued and much-needed renaissance in biopharmaceutical manufacturing, this book covers the different strategies and assembles top-tier technology experts to address the challenges of antibody purification. Updates existing topics and adds new ones that include purification of antibodies produced in novel production systems, novel separation technologies, novel antibody formats and alternative scaffolds, and strategies for ton-scale manufacturing. Presents new and updated discussions of different purification technologies, focusing on how they can address the capacity crunch in antibody purification. Emphasizes antibodies and innovative chromatography methods for processing.

**The Chemical Engineer**

**Batch Processing**

In last decades rapid scientific and engineering developments have been occurring within the context of Biotechnology. If the World Economy is to benefit fully from the advances in biosciences and biochemical engineering, it must be able to focus new knowledge on commercially appropriate targets. Modern Biotechnology is a mixture of far reaching innovation superimposed on an industrial background and it represents a means of production with bright prospects, challenging problems and stimulating competition. This NATO Advanced Study Institute on "RECENT ADVANCES IN INDUSTRIAL APPLICATIONS OF BIOTECHNOLOGY" held between September 16-27, 1991 in Kusadasi was the first ASI on Biotechnology in Turkey. It was aiming to provide an updated overview of the fundamental principles, novel application areas and impact of Biotechnology on international economy. Recent developments in the field of Biotechnology have been thoroughly discussed, concentrating on various interdisciplinary aspects. The illain lectures presented at the Institute covered both scientific and commercial aspects of new developments in biotechnology and discussed the possible ways of meeting the challenges of the industry. The main lectures were supplemented by Oral 2nd Poster Presentations. Thus, this volume is comprised of three sections. Part I contains the invited lectures and Part II oral presentations. Exte-ded abstracts of poster presentations have been included in Part III to provide a more comprehensive coverage of the ASI.
Handbook of Industrial Crystallization

Separation of Molecules, Macromolecules and Particles

Commercially, D-xylitol is produced by chemical reactions that are tailored to the requirements of various sectors. However, due to the rising interest in sustainable development and ecologically benign practices, microbial conversion processes are generally preferred over the conventional chemical conversion process. The former have multiple advantages, including less chemical load on the environment, higher efficiency, and the ability to dilute multiple downstream transformation attempts while maintaining product yield and recovery. This book aims to disseminate the most current advances in the biotechnological production of D-xylitol and its applications in medical and health care. It is a unique collection of 15 book chapters split into 5 sections and written by experts in their respective fields, who present critical insights into several topics, review current research, and discuss future progress in this area. This book also provides essential information on hemicellulose hydrolysis to recover D-xylose, detoxification of hemicellulose hydrolysates, and improved fermentation methods for increased D-xylitol production. The highlights of strain improvement to increase the D-xylitol titers and downstream recovery of D-xylitol are also discussed in several sections. The current applications of D-xylitol in medical and health care have been used to justify the cost incurred for setting up the demonstration plant for D-xylitol production in the market. Apart from researchers and post-graduate students in the field of microbial biotechnology, this book will assist those in the business community who deal with the economic analysis of bio-based products and their marketing.

Protein Bioseparation Using Ultrafiltration

Principles of Bioseparations Engineering

This new volume examines the state of the art of several important separation processes as they relate to biotechnology. Focusing on isolation and purification of downstream processing, it presents recent research results of several promising techniques. Its 15 chapters cover extraction and membrane processing, processes using biospecific interaction with proteins, and novel isolation and purification processes. Many of the chapters contain data that have not been published before. This volume presents the spectrum of current thinking and activities on bioseparation, specifically of large molecules such as proteins and polysaccharides.

Bioseparations


Books in Print

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

Separation and Purification Technologies in Biorefineries

Downstream Processing and Bioseparation

Offers a concise introduction to the separation and purification of biochemicals. Bridges two scientific cultures, providing an introduction to bioseparations for scientists with no background in engineering and for engineers with little grounding in biology. The authors supplement the ideas by simple worked examples, making the techniques of bioseparations easy to learn. Discusses removal of insolubles, product isolation, purification and polishing.

American Scientist

A study of equilibrium, mass transfer, and fixed bed dynamic phenomena in recovery, separation, and purification of amino acids by ion exchange

In this era of biotechnology there have been many books covering the fundamentals of recombinant DNA technology and protein chemistry. However, not many sources are available for
the pharmaceutical development scientist and other personnel responsible for the commercialization of the finished dosage forms of these new biopharmaceuticals and other products from biotechnology. This text will help to fill this gap. Once active biopharmaceutical molecules are candidates for clinical trial investigation and subsequent commercialization, a number of other activities must take place while research and development on these molecules continues. The active ingredient itself must be formulated into a finished dosage form that can be conveniently used by health care professionals and patients. Properties of the biopharmaceutical molecule must be clearly understood so that the appropriate finished product formulation can be developed. Finished product formulation development includes not only the chemical formulation, but also the packaging system, the manufacturing process, and appropriate control strategies to assure such good manufacturing practice attributes as safety, identity, strength, purity, and quality.

**Biotechnology Progress**

**Handbook of Industrial Drying, Fourth Edition**

Providing chemical engineering undergraduate and graduate students with a basic understanding of how separation of a mixture of molecules, macromolecules or particles is achieved, this textbook is a comprehensive introduction to the engineering science of separation. Students learn how to apply their knowledge to determine the separation achieved in a given device or process. Real-world examples are taken from biotechnology, chemical, food, petrochemical, pharmaceutical and pollution control industries. Worked examples, elementary separator designs and chapter-end problems are provided, giving students a practical understanding of separation. The textbook systematically develops different separation processes by considering the forces causing the separation and how this separation is influenced by the patterns of bulk flow in the separation device. Readers will be able to take this knowledge and apply it to their own future studies and research in separation and purification. Online resources include solutions to the exercises and guidance for computer simulations.

**Separations for Biotechnology 2**

**Bioseparations of Proteins**

Bioanalytical Techniques form an integral part of applied biology and biomedical sciences. The various principles of bioanalytical techniques used in biomedical sciences, environmental studies, life sciences, pharmaceutical analysis, molecular biology, and biotechnological research are comprehensively discussed in this book. Analytical instrumentation is also explained in as concise a manner as possible. Microscopy, centrifugation, chromatography, electrophoresis, spectroscopy, and radioisotope and immunodiagnostic techniques are the main topics focussed in this book. Techniques in molecular biology and recombinant DNA technology have also been described in detail.

**Scientific and Technical Books and Serials in Print**

Bioseparations engineering deals with the scientific and engineering principles involved in large-scale separation and purification of biological products. It is a key component of most chemical engineering/biotechnology/bioprocess engineering programmes. This book discusses the underlying principles of bioseparations engineering written from the perspective of an undergraduate course. It covers membrane based bioseparations in much more detail than some of the other books on bioseparations engineering. Based largely on the lecture notes the author developed to teach the course, this book is especially suitable for use as an undergraduate level textbook, as most other textbooks are targeted at graduate students.

**The Impact of Chemistry on Biotechnology**

**Degradation of plant cell wall polymers**

The challenge of bioseparations is to isolate and purify identified products from the dilute product broth produced from cell culture. Innovation in bioseparations technology is increasingly driven by the requirements imposed by the growing importance of production on a process scale of injectable-grade products, and economic pressures to improve the efficiency of downstream processing. As in other areas of technical change, science does not necessarily precede new technology: progress results from a complex and messy mixture of advances in understanding, ingenious ideas, novel techniques and chance discoveries. What is certain is that close interaction between academics and practitioners, biological scientists and process engineers, is needed to solve the problems of bioseparations. The Second International Conference on Separations for Biotechnology at Reading, UK, in September 1990 set out to provide a critical multidisciplinary forum for the discussion of bioseparations. This volume contains the papers presented at the meeting. The meeting was organized around six themes with oral and poster presentations on the science and practice of bioseparations technology, and the same structure has been kept for this book. We have also included the texts of the keynote review paper by Professor Alan Michaels and the introductory review papers specially commissioned for the conference. Within each part of this book the review paper is followed by the contributed papers grouped alphabetically by their first author. All the original papers published here were accepted for
BIOSPERATIONS

Ultrafiltration is a pressure-driven, membrane-based separation process, which is used for a broad variety of applications, ranging from the processing of biological macromolecules to wastewater treatment. It has significant advantages over competing separation technologies. Food and biotechnological applications account for nearly 40% of the current total usage of ultrafiltration membranes. Protein bioseparation is an important component of this application segment. Ultrafiltration is used for protein concentration, desalting, clarification and fractionation (i.e. protein–protein separation). Concentration, desalting and clarification are technologically less demanding and have been in use in the bioprocess industry for some time. Protein fractionation, on the other hand, is a challenging proposition and is definitely a more recent development. This book focuses primarily on protein fractionation. Contents: Protein Bioseparation: An OverviewUltrafiltration: An OverviewMembranesMembrane Module and OperationMembrane FoulingPermeate Flux in UltrafiltrationProtein Transmission Through UltrafiltrationMembranesSelectivity of Protein Fractionation in UltrafiltrationProtein ConcentrationDiafiltration of Protein SolutionsProtein ClarificationProtein FractionationNew Developments Readershio: Graduate students, academics and researchers in biotechnology, biochemistry, food sciences, bioengineering/biomedical engineering and chemical engineering.

The 1995 IChemE Research Event - First European Conference for Young Researchers in Chemical Engineering

These Proceedings comprise contributions from scientists and engineers in academia and industry on practical aspects of production and purification of recombinant proteins. International, practice-oriented and detailed, the book is divided into four parts: - Choosing a production system - Propagation of recombinant microorganisms and animal cells - Purification of recombinant proteins - Health care and veterinary recombinant products Moreover, the book is interdisciplinary. This ensures that all important aspects of the production of recombinant proteins are considered. Genetic engineers, biochemical engineers, microbiologists, virologists and biochemists, protein chemists and quality control experts will find this reference book to be an indispensable guide for their daily work.

Separations for Biotechnology

Written by the world’s leading scientists and spanning over 400 articles in three volumes, the Encyclopedia of Food Microbiology, Second Edition is a complete, highly structured guide to current knowledge in the field. Fully revised and updated, this encyclopedia reflects the key advances in the field since the first edition was published in 1999. The articles in this key work, heavily illustrated and fully revised since the first edition in 1999, highlight advances in areas such as genomics and food safety to bring users up-to-date on microorganisms in foods. Topics such as DNA sequencing and E. coli are particularly well covered. With lists of further reading to help users explore topics in depth, this resource will enrich scientists at every level in academia and industry, providing fundamental information as well as explaining state-of-the-art scientific discoveries. This book is designed to allow disparate approaches (from farmers to processors to food handlers and consumers) and interests to access accurate and objective information about the microbiology of foods. Microbiology impacts the safe presentation of food. From harvest and storage to determination of shelf-life, to presentation and consumption. This work highlights the risks of microbial contamination and is an invaluable go-to guide for anyone working in Food Health and Safety. Has a two-fold industry appeal (1) those developing new functional food products and (2) to all corporations concerned about the potential hazards of microbes in their food products.

Adsorbents

A comprehensive, 20-volume reference encyclopedia on science and technology.

Molecular Thermodynamics of Some Highly Asymmetric Liquid Mixtures

Essential for the top of every desk and laboratory bench, this single volume reference is the first and last resource required to answer any question relating to molecular biology, biotechnology, or molecular medicine. This work contains the theory and techniques for understanding, modifying, manipulating, expressing, and synthesizing biological molecules, conformations, and aggregates. Over 250 carefully reviewed articles written by 378 eminent scientists in the field, provide detailed and readable coverage of today’s most relevant topics including life processes at the molecular level, genetic disease diagnosis and genetic therapy, the theory and techniques for understanding, manipulating, and synthesizing biological molecules and their aggregates.

Development and Manufacture of Protein Pharmaceuticals

A fully-referenced summary of the proceedings of the 1995 Research Event, the first European conference for young researchers and chemical engineers.

Handbook of Membrane Separations

This work provides comprehensive coverage of modern biochemical engineering, detailing the basic concepts underlying the behaviour of bioprocesses as well as advances in bioprocess and biochemical engineering science. It includes discussions of topics such as enzyme kinetics and biocatalysis, microbial growth and product formation, bioreactor design, transport in bioreactors, bioproduct recovery and bioprocess economics and design. A solutions manual is available to instructors only.
**Biologicals from Recombinant Microorganisms and Animal Cells**

By far the most commonly encountered and energy-intensive unit operation in almost all industrial sectors, industrial drying continues to attract the interest of scientists, researchers, and engineers. The Handbook of Industrial Drying, Fourth Edition not only delivers a comprehensive treatment of the current state of the art, but also serves as a consultative reference for streamlining industrial drying operations. New to the Fourth Edition: Computational fluid dynamic simulation Solar, impingement, and pulse combustion drying Drying of fruits, vegetables, sugar, biomass, and coal Physicochemical aspects of sludge drying Life-cycle assessment of drying systems Covering commonly encountered dryers as well as innovative dryers with future potential, the Handbook of Industrial Drying, Fourth Edition not only details the latest developments in the field, but also explains how improvements in dryer design and operation can increase energy efficiency and cost-effectiveness.

**BIOCHEMICAL ENGINEERING**

Separation and purification processes play a critical role in biorefineries and their optimal selection, design and operation to maximise product yields and improve overall process efficiency. Separations and purifications are necessary for upstream processes as well as in maximising and improving product recovery in downstream processes. These processes account for a significant fraction of the total capital and operating costs and also are highly energy intensive. Consequently, a better understanding of separation and purification processes, current and possible alternative and novel advanced methods is essential for achieving the overall techno-economic feasibility and commercial success of sustainable biorefineries. This book presents a comprehensive overview focused specifically on the present state, future challenges and opportunities for separation and purification methods and technologies in biorefineries. Topics covered include: Equilibrium Separations: Distillation, liquid-liquid extraction and supercritical fluid extraction. Affinity-Based Separations: Adsorption, ion exchange, and simulated moving bed technologies. Membrane Based Separations: Microfiltration, ultrafiltration and diafiltration, nanofiltration, membrane pervaporation, and membrane distillation. Solid-liquid Separations: Conventional filtration and solid-liquid extraction. For each of these processes, the fundamental principles and design aspects are presented, followed by a detailed discussion and specific examples of applications in biorefineries. Each chapter also considers the market needs, industrial challenges, future opportunities, and economic importance of the separation and purification methods. The book concludes with a series of detailed case studies including cellulosic bioethanol production, extraction of oil from microalgae, and production of biopolymers. Separation and Purification Technologies in Biorefineries is an essential resource for scientists and engineers, as well as researchers and academics working in the broader conventional and emerging bio-based products industry, including biomaterials, biochemicals, biofuels and bioenergy.

**Process Scale Purification of Antibodies**

**Protein Diffusion in Chromatographic Media**

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