
Biochemical Engineering Blanch Clark

Separation Process Principles with Applications Using Process Simulators, 4th Edition

Second Edition

Biochemical Engineering

Chemical Engineering Design

Biorefineries

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Bioprocess Engineering

Comprehensive Biotechnology

R&D to Manufacturing

Bioreaction Engineering

Springer Handbook of Marine Biotechnology

Production, Isolation and Purification of Industrial Products

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Separation Process Principles with Applications Using Process Simulators, 4th Edition Springer

The chemical industry is changing, going beyond commodity chemicals to a palette of higher value added products. This groundbreaking book, now revised and expanded, documents this change and shows how to meet the challenges implied. Presenting a four-step design process - needs, ideas, selection,

manufacture - the authors supply readers with a simple design template that can be applied to a wide variety of products. Four new chapters on commodities, devices, molecules/drugs and microstructures show how this template can be applied to products including oxygen for emphysema patients, pharmaceuticals like taxol, dietary supplements like lutein, and beverages which are more satisfying. For different groups of products the authors supply both strategies for design and summaries of relevant science. Economic analysis is expanded,

emphasizing the importance of speed-to-market, selling ideas to investors and an expectation of limited time in the market. Extra examples, homework problems and a solutions manual are available.

Second Edition Cambridge University Press

Current Developments in Biotechnology and Bioengineering: Production, Isolation and Purification of Industrial Products provides extensive coverage of new developments, state-of-the-art technologies, and potential future trends, focusing on industrial biotechnology and bioengineering practices for the production of industrial products, such as enzymes, organic acids, biopolymers, and biosurfactants, and the processes for isolating and

purifying them from a production medium. During the last few years, the tools of molecular biology and genetic and metabolic engineering have rendered tremendous improvements in the production of industrial products by fermentation. Structured by industrial product classifications, this book provides an overview of the current practice, status, and future potential for the production of these agents, along with reviews of the industrial scenario relating to their production. Provides information on industrial bioprocesses for the production of microbial products by fermentation Includes separation and purification processes of fermentation products Presents economic and feasibility assessments of the various processes and their scaling up Links

biotechnology and bioengineering for industrial process development

Biochemical Engineering Butterworth-Heinemann

This book presents the latest technological advances in Raman spectroscopy that are presently redrawing the landscape of many fields of biomedical and pharmaceutical R&D. Numerous examples are given to illustrate the application of the new methods.

Chemical Engineering Design CRC Press

Vinegars can be considered as acidic products of special importance for the enrichment of our diet, and resulting from the desired or controlled oxidation of ethanol containing (liquid) substrates. The traditional use and integration of

vinegars in numerous cultures can be traced back to ancient times. In fact, the cultural heritage of virtually every civilization includes one or more vinegars made by the souring action (of micro-organisms) following alcoholic fermentation. It has been documented that the Egyptians, Sumerians and Babylonians had experience and technical knowledge in making vinegar from barley and any kind of fruit. Vinegar was very popular both in ancient Greece and Rome, where it was used in food preparations and as remedy against a great number of diseases. In Asia, the first records about vinegar date back to the Zhou Dynasty (1027-221 BC) and probably China's ancient rice wines may have originally been derived from fruit, for which (malted) rice was substituted

later. The historical and geographical success of vinegars is mainly due to the low technology required for their production, and to the fact that several kinds of raw materials rich in sugars may easily be processed to give vinegar. In addition, vinegars are well-known and accepted as safe and stable commodities that can be consumed as beverages, health drinks or added to food as preservatives or as flavoring agents.

Biorefineries Springer Science & Business Media

Petroleum refining and process engineering is constantly changing. No new refineries are being built, but companies all over the world are still expanding or re-purposing huge percentages of their refineries every

year, year after year. Rather than building entirely new plants, companies are spending billions of dollars in the research and development of new processes that can save time and money by being more efficient and environmentally safer. Biodesulfurization is one of those processes, and nowhere else it is covered more thoroughly or with more up-to-date research of the new advances than in this new volume from Wiley-Scrivener. Crude oil consists of hydrocarbons, along with other minerals and trace elements. Sulfur is the most abundant element after carbon and hydrogen, then comes after it nitrogen, and they usually concentrated in the higher boiling fractions of the crude oil. The presence of sulfur compounds causes the corrosion of

refining facilities and catalysts poisoning. Moreover, the presence of nitrogen-compounds directly impacts the refining processes via; poisoning the cracking catalysts and inhibiting the hydrodesulfurization catalysts. In addition, both have bad impacts on the environment, throughout the sulfur and nitrogen oxide emissions. Removing this sulfur and nitrogen from the refining process protects equipment and the environment and creates a more efficient and cost-effective process. Besides the obvious benefits to biodesulfurization, there are new regulations in place within the industry with which companies will, over the next decade or longer, spend literally tens, if not hundreds, of billions of dollars to comply. Whether for the veteran

engineer needing to update his or her library, the beginning engineer just learning about biodesulfurization, or even the student in a chemical engineering class, this outstanding new volume is a must-have. Especially it covers also the bioupgrading of crude oil and its fractions, biodenitrogenation technology and application of nanotechnology on both biodesulfurization and denitrogenation technologies.

Biochemical Engineering, Second Edition Pearson Education

"Designed for an introductory course on Biochemical Engineering, this book interweaves bioprocessing with chemical reaction engineering concepts"--Back cover.

Bioprocess Engineering Springer Science

& Business Media

Comprehensive Biotechnology, Third Edition unifies, in a single source, a huge amount of information in this growing field. The book covers scientific fundamentals, along with engineering considerations and applications in industry, agriculture, medicine, the environment and socio-economics, including the related government regulatory overviews. This new edition builds on the solid basis provided by previous editions, incorporating all recent advances in the field since the second edition was published in 2011. Offers researchers a one-stop shop for information on the subject of biotechnology Provides in-depth treatment of relevant topics from recognized authorities, including the

contributions of a Nobel laureate

Presents the perspective of researchers in different fields, such as biochemistry, agriculture, engineering, biomedicine and environmental science

CRC Press

Closing a gap in the literature, this comprehensive book examines and discusses different non-aqueous systems from organic solvents to ionic liquids for synthetic applications, thus opening the door to new successful methods for biocatalytic reactions. It gathers into one handy source the information otherwise widely spread throughout the literature, combining useful background information with a number of synthetic examples, including industrial scale processes for pharmaceutical and fine chemicals. Extremely well structured,

the text introduces the fundamentals of non-aqueous enzymology, before going on to new reaction media and synthetic applications using hydrolases and non-hydrolytic enzymes. The one-stop reference for everyone working in this hot field.

Comprehensive Biotechnology Elsevier

Extensive application of bioprocesses has generated an expansion in biotechnological knowledge, generated by the application of biochemical engineering to biotechnology.

Microorganisms produce alcohols and acetone that are used in industrial processes. The knowledge related to industrial microbiology has been revolutionized by the ability of genetically engineered cells to make many new products. Genetic engineering

and gene mounting has been developed to enhance industrial fermentation. Ultimately, these bioprocesses have become a new way of developing commercial products. Biochemical Engineering and Biotechnology demonstrates the application of biological sciences in engineering with theoretical and practical aspects to enhance understanding of knowledge in this field. The book adopts a practical approach, showing related case studies with original research data. It is an ideal text book for college and university courses, which guides students through the lectures in a clear and well-illustrated manner. · Demonstrates the application of biological sciences in engineering with theoretical and practical aspects. · Unique practical

approach, using case studies, detailed experiments, original research data and problems and possible solutions. · Gives detailed experiments with simple design equations and the required calculations.

R&D to Manufacturing Elsevier
Biochemical Engineering, Second Edition CRC Press
Bioreaction Engineering Springer

The emergence and refinement of techniques in molecular biology has changed our perceptions of medicine, agriculture and environmental management. Scientific breakthroughs in gene expression, protein engineering and cell fusion are being translated by a strengthening biotechnology industry into revolutionary new products and services. Many a student has been enticed by the promise of biotechnology

and the excitement of being near the cutting edge of scientific advancement. However, graduates trained in molecular biology and cell manipulation soon realise that these techniques are only part of the picture. Reaping the full benefits of biotechnology requires manufacturing capability involving the large-scale processing of biological material. Increasingly, biotechnologists are being employed by companies to work in co-operation with chemical engineers to achieve pragmatic commercial goals. For many years aspects of biochemistry and molecular genetics have been included in chemical engineering curricula, yet there has been little attempt until recently to teach aspects of engineering applicable to process design to biotechnologists. This

textbook is the first to present the principles of bioprocess engineering in a way that is accessible to biological scientists. Other texts on bioprocess engineering currently available assume that the reader already has engineering training. On the other hand, chemical engineering textbooks do not consider examples from bioprocessing, and are written almost exclusively with the petroleum and chemical industries in mind. This publication explains process analysis from an engineering point of view, but refers exclusively to the treatment of biological systems. Over 170 problems and worked examples encompass a wide range of applications, including recombinant cells, plant and animal cell cultures, immobilised catalysts as well as traditional

fermentation systems. * * First book to present the principles of bioprocess engineering in a way that is accessible to biological scientists * Explains process analysis from an engineering point of view, but uses worked examples relating to biological systems * Comprehensive, single-authored * 170 problems and worked examples encompass a wide range of applications, involving recombinant plant and animal cell cultures, immobilized catalysts, and traditional fermentation systems * 13 chapters, organized according to engineering sub-disciplines, are grouped in four sections - Introduction, Material and Energy Balances, Physical Processes, and Reactions and Reactors * Each chapter includes a set of problems and exercises for the student, key

references, and a list of suggestions for further reading * Includes useful appendices, detailing conversion factors, physical and chemical property data, steam tables, mathematical rules, and a list of symbols used * Suitable for course adoption - follows closely curricula used on most bioprocessing and process biotechnology courses at senior undergraduate and graduate levels.

Springer Handbook of Marine Biotechnology Springer Science & Business Media

Edited by two of the most distinguished pioneers in genetic manipulation and bioprocess technology, this bestselling reference presents a comprehensive overview of current cell culture technology used in the pharmaceutical industry. Contributions from several

leading researchers showcase the importance of gene discovery and genomic technology development
Production, Isolation and Purification of Industrial Products Springer Science & Business Media

Industrial Biotechnology offers a comprehensive overview of biochemical processes, technologies, and practical applications of industrial biotechnology. The work comprises of chapters that discuss medium preparation, inoculum preparation using industrial strain and upstream processing, various fermentation processes, and physico-chemical separation processes for the purification of products and packaging. Analyzes problems within biochemical processes Discusses stoichiometry of bioprocesses Covers upstream and

downstream processing Offers a wealth of case studies of different biochemical production processes, including those in development of food products, vaccines and medicines, single cell proteins, amino acids, cheese, biodiesel, biopesticides, and more This book is aimed at advanced students, industrial practitioners, and researchers in biotechnology, food engineering, chemical engineering, and environmental engineering.

Carbohydrate Biotechnology

Protocols John Wiley & Sons

Nitrification and denitrification are essential processes for aquatic ecological system and vital for human health. While ammonia is applied for disinfection together with chlorine to produce chloramine, excessive ammonia

may cause nitrification and bacteria growth in water transmission pipeline. Since excessive discharge may cause eutrophication and deterioration of aquatic system, nitrate is regulated for wastewater discharge in sensitive areas. Further, nitrate needs to be monitored and controlled in drinking water treatment to protect against methemoglobinemia in bottle-fed infants.

Fundamentals of Biochemical Engineering Springer

This is the second edition of the text "Bioreaction Engineering Principles" by Jens Nielsen and John Villadsen, originally published in 1994 by Plenum Press (now part of Kluwer). Time runs fast in Biotechnology, and when Kluwer Plenum stopped reprinting the first

edition and asked us to make a second, revised edition we happily accepted. A text on bioreactions written in the early 1990's will not reflect the enormous development of experimental as well as theoretical aspects of cellular reactions during the past decade. In the preface to the first edition we admitted to be newcomers in the field. One of us (JV) has had 10 more years of job training in biotechnology, and the younger author (IN) has now received international recognition for his work with the hottest topics of "modern" biotechnology. Furthermore we are happy to have induced Gunnar Liden, professor of chemical reaction engineering at our sister university in Lund, Sweden to join us as co-author of the second edition. His contribution, especially on the

chemical engineering aspects of "real" bioreactors has been of the greatest value. Chapter 8 of the present edition is largely unchanged from the first edition. We wish to thank professor Martin Hjortso from LSU for his substantial help with this chapter.

Cell Culture Technology for Pharmaceutical and Cell-Based Therapies BoD - Books on Demand
Learn Chemical Reaction Engineering through Reasoning, Not Memorization
Essentials of Chemical Reaction Engineering is the complete, modern introduction to chemical reaction engineering for today's undergraduate students. Starting from the strengths of his classic *Elements of Chemical Reaction Engineering, Fourth Edition*, in this volume H. Scott Fogler added new

material and distilled the essentials for undergraduate students. Fogler's unique way of presenting the material helps students gain a deep, intuitive understanding of the field's essentials through reasoning, using a CRE algorithm, not memorization. He especially focuses on important new energy and safety issues, ranging from solar and biomass applications to the avoidance of runaway reactions. Thoroughly classroom tested, this text reflects feedback from hundreds of students at the University of Michigan and other leading universities. It also provides new resources to help students discover how reactors behave in diverse situations-including many realistic, interactive simulations on DVD-ROM. New Coverage Includes Greater

emphasis on safety: following the recommendations of the Chemical Safety Board (CSB), discussion of crucial safety topics, including ammonium nitrate CSTR explosions, case studies of the nitroaniline explosion, and the T2 Laboratories batch reactor runaway Solar energy conversions: chemical, thermal, and catalytic water spilling Algae production for biomass Steady-state nonisothermal reactor design: flow reactors with heat exchange Unsteady-state nonisothermal reactor design with case studies of reactor explosions About the DVD-ROM The DVD contains six additional, graduate-level chapters covering catalyst decay, external diffusion effects on heterogeneous reactions, diffusion and reaction, distribution of residence times for

reactors, models for non-ideal reactors, and radial and axial temperature variations in tubular reactions. Extensive additional DVD resources include Summary notes, Web modules, additional examples, derivations, audio commentary, and self-tests Interactive computer games that review and apply important chapter concepts Innovative "Living Example Problems" with Polymath code that can be loaded directly from the DVD so students can play with the solution to get an innate feeling of how reactors operate A 15-day trial of Polymath(tm) is included, along with a link to the Fogler Polymath site A complete, new AspenTech tutorial, and four complete example problems Visual Encyclopedia of Equipment, Reactor Lab, and other intuitive tools More than 500

PowerPoint slides of lecture notes Additional updates, applications, and information are available at www.umich.edu/~essen and www.essentialsofcre.com. Vinegars of the World Elsevier All engineering disciplines have been developed from the basic sciences. Science gives us the information on the reasoning behind new product development, whereas engineering is the application of science to manufacture the product at the commercial level. Biological processes involve various biomolecules, which come from living sources. It is now possible to manipulate DNA to get the desired changes in biochemical processes. This book provides students the knowledge that will enable them to

contribute in various professional fields, including bioprocess development, modeling and simulation, and environmental engineering. It includes the analysis of different upstream and downstream processes. The chapters are organized in broad engineering subdisciplines, such as mass and energy balances, reaction theory using both chemical and enzymatic reactions, microbial cell growth kinetics, transport phenomena, different control systems used in the fermentation industry, and case studies of some industrial fermentation processes. Each chapter begins with a fundamental explanation for general readers and ends with in-depth scientific details suitable for expert readers. The book also includes the solutions to about 100 problems.

Organic Synthesis with Enzymes in Non-Aqueous Media Elsevier

This book deals with various unique elements in the drug development process within chemical engineering science and pharmaceutical R&D. The book is intended to be used as a professional reference and potentially as a text book reference in pharmaceutical engineering and pharmaceutical sciences. Many of the experimental methods related to pharmaceutical process development are learned on the job. This book is intended to provide many of those important concepts that R&D Engineers and manufacturing Engineers should know and be familiar if they are going to be successful in the Pharmaceutical Industry. These include basic analytics for

quantitation of reaction components—often skipped in ChE Reaction Engineering and kinetics books. In addition Chemical Engineering in the Pharmaceutical Industry introduces contemporary methods of data analysis for kinetic modeling and extends these concepts into Quality by Design strategies for regulatory filings. For the current professionals, in-silico process modeling tools that streamline experimental screening approaches is also new and presented here. Continuous flow processing, although mainstream for ChE, is unique in this context given the range of scales and the complex economics associated with transforming existing batch-plant capacity. The book will be split into four distinct yet related

parts. These parts will address the fundamentals of analytical techniques for engineers, thermodynamic modeling, and finally provides an appendix with common engineering tools and examples of their applications.

Chemical Engineering in the Pharmaceutical Industry Springer Science & Business Media

For Senior-level and graduate courses in Biochemical Engineering, and for programs in Agricultural and Biological Engineering or Bioengineering. This concise yet comprehensive text introduces the essential concepts of bioprocessing—internal structure and functions of different types of microorganisms, major metabolic pathways, enzymes, microbial genetics, kinetics and stoichiometry of growth and

product information-to traditional chemical engineers and those in related disciplines. It explores the engineering principles necessary for bioprocess synthesis and design, and illustrates the application of these principles to modern biotechnology for production of pharmaceuticals and biologics, solution of environmental problems, production of commodities, and medical applications.

Principles and Applications of Environmental Biotechnology for a Sustainable Future CRC Press

This Springer Handbook provides, for the first time, a complete and consistent overview over the methods, applications, and products in the field of marine biotechnology. A large portion of the surface of the earth (ca. 70%) is covered

by the oceans. More than 80% of the living organisms on the earth are found in aquatic ecosystems. The aquatic systems thus constitute a rich reservoir for various chemical materials and (bio-)chemical processes. Edited by a renowned expert with a longstanding experience, and including over 60 contributions from leading international scientists, the Springer Handbook of Marine Biotechnology is a major authoritative desk reference for everyone interested or working in the field of marine biotechnology and bioprocessing - from undergraduate and graduate students, over scientists and teachers, to professionals. Marine biotechnology is concerned with the study of biochemical materials and processes from marine sources, that

play a vital role in the isolation of novel drugs, and to bring them to industrial and pharmaceutical development. Today, a multitude of bioprocess techniques is employed to isolate and produce marine natural compounds, novel biomaterials, or proteins and enzymes from marine organisms, and to bring them to applications as pharmaceuticals, cosmeceuticals or nutraceuticals, or for the production of bioenergy from marine sources. All these topics are addressed by the Springer Handbook of Marine Biotechnology. The book is divided into ten parts. Each part

is consistently organized, so that the handbook provides a sound introduction to marine biotechnology - from historical backgrounds and the fundamentals, over the description of the methods and technology, to their applications - but it can also be used as a reference work. Key topics include: - Marine flora and fauna - Tools and methods in marine biotechnology - Marine genomics - Marine microbiology - Bioenergy and biofuels - Marine bioproducts in industrial applications - Marine bioproducts in medical and pharmaceutical applications - and many more...

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