Scaleup Of Chemical Processes Conversion From Laboratory Scale Tests To Successful Commercial Size Design

Second Edition
Fossil Energy Update
Analysis, Synthesis and Design of Chemical Processes
The Role of Green Chemistry in Biomass Processing and Conversion
Practical Guides in Chemical Engineering
Scale-up in Chemical Engineering
A Practical Innovation Guide from Idea to Commercial Implementation
Exploring the Potential of Bioreductions
Scale-up Methodology for Chemical Processes
Organic Synthesis Engineering
Pharmaceutical Process Scale-Up
Chemical Projects Scale Up

Synthetic Methods for Biologically Active Molecules
Scaleup of Chemical Processes
A Practical Design Approach
Industrial Applications
Catalytic Process Development for Renewable Materials
Chemical Reactor Design, Optimization, and Scaleup
Methodology and Applications
Dimensional Analysis
Scaleup of Chemical Processes
Fluidization, Solids Handling, and Processing
A Unique Handbook for the Chemical Process Industry
Chemical Process Design and Integration
Organic Electrochemistry, Fourth Edition,
Japan, Russia, Ukraine, and Belarus
Climate Change and Green Chemistry of CO2 Sequestration
Conversion from Laboratory Scale Tests to Successful Commercial Size Design
Chemical Reactions and Processes Under Flow Conditions
SI edition
Principles, Practice and Economics of Plant and Process Design
Pilot Plants and Scale-up of Chemical Processes II
Butterworths Series in Chemical Engineering
Handbook of Fluidization and Fluid-Particle Systems
Design of Multiphase Reactors

Iterative Methods for the Chemical, Mineral and Biological Industries
Crystallization Process Systems
The Pilot Plant Real Book
Scale-Up Processes

AMAYA BRAYLON

Second Edition Walter de Gruyter GmbH & Co KG
Chemical Engineering Design is one of the best-known and most widely adopted texts available for students of chemical engineering. It completely covers the standard chemical engineering final year design course, and is widely used as a graduate text. The hallmarks of this renowned book have always been its scope, practical emphasis and closeness to the curriculum. That it is written by practicing chemical engineers makes it particularly popular with students who appreciate its relevance and clarity. Building on this position of strength the fifth edition covers the latest aspects of process design, operations, safety, loss prevention and equipment selection, and much more. Comprehensive in coverage, exhaustive in detail, and supported by extensive problem sets

at the end of each chapter, this is a book that students will want to keep to hand as they enter their professional life. The leading chemical engineering design text with over 25 years of established market leadership to back it up; an essential resource for the compulsory design project all chemical engineering students take in their final year A complete and trusted teaching and learning package: the book offers a broader scope, better curriculum coverage, more extensive ancillaries and a more student-friendly approach, at a better price, than any of its competitors Endorsed by the Institution of Chemical Engineers, guaranteeing wide exposure to the academic and professional market in chemical and process engineering.

Fossil Energy Update

Newnes

This book provides a comprehensive, step-by-step approach to organic process research and development in the pharmaceutical, fine chemical, and agricultural chemical industries. Process R&D describes the steps taken, following synthesis and evaluation, to bring key compounds to market in a cost-effective manner. More people are being hired for work in this

area as increasing numbers of drug candidates are identified through combinatorial chemistry and high-throughput screening. The book is directed to industrial (primarily organic) chemists, and academicians (particularly those involved in a growing number of start-up companies) and students who need insight into industrial process R&D. Current books do not describe hands-on, step-by-step, approaches to solving process development problems, including route, reagent, and solvent selection; optimising catalytic reactions; chiral syntheses; and "green chemistry." "Practical Process Research and Development" will be a valuable resource for researchers, managers, and graduate students. Provides insights into generating rugged, practical, cost-effective processes for the chemical preparation of "small molecules" Breaks down process optimization into route, reagent and solvent selection, development of reaction conditions, workup, crystallizations and more Includes over 100 tips for rapid process development Presents guidelines for implementing and troubleshootin

g processes
Analysis, Synthesis and Design of Chemical Processes
John Wiley & Sons
This book will formally launch "organic synthesis engineering" as a distinctive field in the armory of the reaction engineer. Its main theme revolves around two developments : catalysis and the role of process intensification in enhancing overall productivity. Each of these two subjects are becoming increasingly useful in organic synthesis engineering, especially in the production of medium and small volume chemicals and enhancing reaction rates by extending laboratory techniques, such as ultrasound, phase transfer catalysts, membrane reactor, and microwaves, to industrial scale production. This volume describes the applications of catalysis in organic synthesis and outlines different techniques of reaction rate and/or selectivity enhancement against a background of reaction engineering principles for both homogeneous and heterogeneou s systems.
The Role of Green Chemistry in Biomass Processing and Conversion
Oxford University Press
The book comprises state-of-the-

art scientific reviews on carbon management strategies in response to climate change. It provides in-depth information on topics relating to recent advances in carbon capture technology and its reuse in value added products. It features contributions of leading scientists and technocrats on topics including climate change and carbon sequestration, lowering carbon footprint CO2 capture, low carbon imperatives in oil industry, CO2 as refrigerant in cold-chain application, carbonic anhydrase-mediated carbon sequestration and utilization, chemical looping combustion with Indian coal, CO2 conversion to chemicals, algae based biofuels, and carbon capture patent landscaping analysis. The contents of this book will be helpful for research scholars, post-graduate students, industry, agricultural scientists and policy makers/planners.

Practical Guides in Chemical Engineering

Fxm Engineering & Design

Selecting the best type of reactor for any particular chemical reaction, taking into consideration safety, hazard analysis, scale-up, and many other factors is essential to

any industrial problem. An understanding of chemical reaction kinetics and the design of chemical reactors is key to the success of the of the chemist and the chemical engineer in such an endeavor. This valuable reference volume conveys a basic understanding of chemical reactor design methodologies, incorporating control, hazard analysis, and other topics not covered in similar texts. In addition to covering fluid mixing, the treatment of wastewater, and chemical reactor modeling, the author includes sections on safety in chemical reaction and scale-up, two topics that are often neglected or overlooked. As a real-world introduction to the modeling of chemical kinetics and reactor design, the author includes a case study on ammonia synthesis that is integrated throughout the text. The text also features an accompanying CD, which contains computer programs developed to solve modeling problems using numerical methods. Students, chemists, technologists, and chemical engineers will all benefit from this comprehensive volume. Shows readers how to select the best reactor design, hazard analysis, and safety in

design methodology Features computer programs developed to solve modeling problems using numerical methods *Scale-up in Chemical Engineering* John Wiley & Sons The classic reference, now expanded and updated Chemical Reactor Design, Optimization, and Scaleup is the authoritative sourcebook on chemical reactors. This new Second Edition consolidates the latest information on current optimization and scaleup methodologies , numerical methods, and biochemical and polymer reactions. It provides the comprehensive tools and information to help readers design and specify chemical reactors confidently, with state-of-the-art skills. This authoritative guide: Covers the fundamentals and principles of chemical reactor design, along with advanced topics and applications Presents techniques for dealing with varying physical properties in reactors of all types and purposes Includes a completely new chapter on meso-, micro-, and nano-scale reactors that addresses such topics as axial diffusion in micro-scale reactors and self-assembly of nano-scale structures Explains the method of false

transients, a numerical solution technique Includes suggestions for further reading, problems, and, when appropriate, scaleup or scaledown considerations at the end of each chapter to illustrate industrial applications Serves as a ready reference for explained formulas, principles, and data This is the definitive hands-on reference for practicing professionals and an excellent textbook for courses in chemical reactor design. It is an essential resource for chemical engineers in the process industries, including petrochemicals, biochemicals, microelectronics, and water treatment. *A Practical Innovation Guide from Idea to Commercial Implementation* CRC Press Bioprocess Engineering involves the design and development of equipment and processes for the manufacturing of products such as food, feed, pharmaceuticals, nutraceuticals, chemicals, and polymers and paper from biological materials. It also deals with studying various biotechnological processes. "Bioprocess Kinetics and Systems Engineering" first of its kind contains systematic and comprehensive content on bioprocess kinetics, bioprocess

systems, sustainability and reaction engineering. Dr. Shijie Liu reviews the relevant fundamentals of chemical kinetics-including batch and continuous reactors, biochemistry, microbiology, molecular biology, reaction engineering, and bioprocess systems engineering-introducing key principles that enable bioprocess engineers to engage in the analysis, optimization, design and consistent control over biological and chemical transformations. The quantitative treatment of bioprocesses is the central theme of this book, while more advanced techniques and applications are covered with some depth. Many theoretical derivations and simplifications are used to demonstrate how empirical kinetic models are applicable to complicated bioprocess systems. Contains extensive illustrative drawings which make the understanding of the subject easy Contains worked examples of the various process parameters, their significance and their specific practical use Provides the theory of bioprocess kinetics from simple concepts to complex metabolic pathways Incorporates sustainability

concepts into the various bioprocesses *Exploring the Potential of Bioreductions* CRC Press Large scale manufacturing of liquid crystal flat panel displays (LCDs) by Japan brought the world's attention to the existence of an enormous market potential exists when there are alternatives to the cathode ray tube (CRT). The Japanese have recognized that new display technologies are critical to making their products highly competitive in the world market. The CRT is losing market share to the solid-state flat panel display. Japan currently holds 90% of the market, and this book outlines opportunities in the former Soviet Union, where companies with the necessary technology are seeking partners, investment, and manufacturing opportunities. Entire cities that were once not even on the map due to their military mission, are now appearing, filled with state-of-the-art electronic technology. The book is developed from the reports issued by investigators based on their field visits to 33 sites in Japan, and 26 sites in Russia, Ukraine, and Belarus. Scale-up Methodology for Chemical Processes Wiley-

Interscience Having gained considerable experience in process development at the Institut FranCais du PEtrole, the authors present a design framework, a review of the available means of investigation, and several examples illustrating their methodology of industrial process scale up. The salient feature of the book is the fact that it addresses a subject which is vital in view of its economic repercussions, yet relatively unknown in technical and scientific circles, due to the confidentiality surrounding it.Contents: 1. Main guidelines of the methodology. 2. Various types of model. 3. Pilot plants and mock-ups. 4. Experimental techniques. 5. Applications to industrial process development. 6. Conclusions. References. Index.

Organic Synthesis Engineering

John Wiley & Sons

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 "modem" 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.

Pharmaceutical Process Scale-Up Elsevier

The focus of this book is on the technical factors that are critical to th e design and startup of a commercial manufacturing facility.

Chemical Projects Scale Up William

Andrew
The focus of this book is on the technical factors that are critical to th e design and startup of a commercial manufacturing facility.
Synthetic Methods for Biologically Active Molecules
Butterworth-Heinemann
This useful reference focuses on the currently available toolbox of bio-catalysed reductions of C=O, C=C and formal C=N bonds to show which transformation s can be reliably used in manufacturing processes and which still require improvements . Following an introductory chapter, chapters 2-4 present the synthetic strategies that are currently available for the reduction of C=C and C=O bonds and for reductive amination, by means of whole-cell catalysts and isolated enzymes. Chapters 5-7 go on to describe the improvements achieved thus far, illustrating the current versatility of enzymes in organic synthesis. Chapters 8-12 present the improvements brought about by the optimization of reaction conditions, and the use of particular synthetic sequences. The final chapter describes practical applications of bio-reductions for the synthesis of active pharmaceutic al ingredients. With its excellent and comprehensiv

e overview, this book will be of great interest to those working in academia and industry. From the contents: * Development of Sustainable Biocatalyzed Reduction Processes for Organic Chemists * Reductases: From Natural Diversity to Biocatalysis and Emerging Enzymatic Activities. * Synthetic Strategies Based on C=C Bioreductions * Synthetic Strategies Based on C=O Bioreductions * Development of Novel Enzymes for the Improved Reduction of C=C Double Bonds * Development of Novel Enzymes for the Improved Reduction of C=O Double Bonds * Synthetic Applications of Aminotransfer ases * Strategies for Cofactor Regeneration in Biocatalyzed Reductions * Effects of Solvent System and Substrate Loading in Bioreduction * Perspectives in the Use of In-Situ Product Removal (ISPR) Techniques in Bioreductions * Multi-Enzymatic Cascade Reactions Based on Reduction Processes * Relevant Practical Applications of Bioreduction Processes in the Synthesis of Active Pharmaceutic al Ingredients

Scaleup of Chemical Processes

Newnes

Focusing on scientific and practical aspects of process scale-up, this resource

details the theory and practice of transferring pharmaceutical processes from laboratory scale to the pilot plant and production scale. It covers parenteral and nonparenterel liquids and semi-solids, products derived from biotechnology, dry blending and powder handling, granulation and drying, fluid bed applications, compaction and tableting, and film coating and regulatory requirements for scale-up and postapproval changes. Drawing on the experience of twenty contributing researchers, the book employs dimensional analysis as a unified scientific approach to quantify similar processes on different scales.

A Practical Design Approach

Elsevier

A presentation of developments in the electrochemistry of C60 and related compounds, electroenzymatic synthesis, conducting polymers, and electrochemical partial fluorination. It contains accounts of carbonyl compounds, anodic oxidation of oxygen-containing compounds, electrosynthesis of bioactive materials, electrolyte reductive coupling, and more.

Industrial Applications

Walter de Gruyter GmbH & Co KG

Presents

seven papers from an October 1998 symposium, of interest to those responsible for translating bench chemistry up to 10-100 liter pilot plants and for those responsible for operating such pilot plants. Looks at productivity, particularly in relation to batch processing and meeting the threat from overseas manufacturing, and details a collaboration project between industry and academia in the UK. Discusses chemical aspects of scale-up, the use of phase transfer catalysis, control of crystallization, and scale-up of organo-lithium and Grignard reactions. Safety concepts are also covered. Annotation copyrighted by Book News, Inc., Portland, OR

Catalytic Process Development for Renewable Materials

Scaleup of Chemical ProcessesConversion from Laboratory Scale Tests to Successful Commercial Size Design Pharmaceutical and fine chemical products are typically synthesised batchwise which is an anomaly since batch processes have a series of practical and economical disadvantages. On the contrary, flow continuous processes present a series of advantages leading to new ways to

synthesise chemical products. Flow processes - * enable control reaction parameters more precisely (temperature, residence time, amount of reagents and solvent etc.), leading to better reproducibility, safer and more reliable processes * can be performed more advantageously using immobilized reagents or catalysts * improve the selectivity and productivity of the process and possibly even the stability of the catalyst * offer opportunities for heat exchange and energy conservation as well as an easy separation and recycling of the reactants and products by adequate process design * achieve multistep syntheses by assembling a line of reactors with minimum or no purification in between two reaction steps * can be assured by facile automation * scale-up can be easily conducted by number-up With all the new research activity in manufacturing chemical products, this comprehensive book is very timely, as it summarises the latest trends in organic synthesis. It gives an insight into flow continuous processes, outlining the basic concepts and explaining the terminology of, and systems approach to, process

design dealing with both homogeneous and heterogeneous catalysis and mini- or micro-reactors. The book contains case studies, extensive bibliographies and reference lists in each chapter to enable the reader to grasp the contents and to go on to more detailed texts on specific subjects if desired. The book is written by both organic chemists and engineers giving a multidisciplinary vision of the new tools and methodologies in this field. It is essential reading for organic chemists (in industry or academia) working alongside chemical engineers or who want to undertake chemical engineering projects. It will also be of interest for chemical engineers to see how basic engineering concepts are applied in modern organic chemistry. **Chemical Reactor Design, Optimization, and Scaleup** Gulf Professional Publishing This book will help industrial process innovators in research, development and commercial start-up to assess the risks of commercial-scale implementation and provide them with practical guidelines and methods to reduce the risks to acceptable levels. The book can also be used in co-

operation with industrial R&D people and academic researchers to shape open innovation programs and in education as a reference book for process innovation courses. Offers easily accessible, step-by-step, and concise guidelines for industrial process scale-up Explains each stage of the innovation funnel: research, development, demonstration, commercial implementation for any process type and branch Based on industrial experiences and practices, which reduces the risks of commercial scale implementation of new processes to acceptable levels and reduces cost and time of process innovation Very clear, attractive layout, using text boxes that contain clarifying notes and additional information on specific topics, which makes it a quick reference of main subjects and additional information

Methodology and Applications

John Wiley & Sons

This reference details particle characterization, dynamics, manufacturing, handling, and processing for the employment of multiphase reactors, as well as procedures in reactor scale-up and design for applications in the chemical, mineral, petroleum, power, cement and pharmaceuticals industries.

The authors discuss flow through fixed beds, elutriati

Dimensional Analysis

Editions TECHNIP

Covering the important task of the scale-up of processes from the laboratory to the production scale, this easily comprehensible and transparent book is divided into two sections. The first part details the theoretical principles, introducing the subject for readers without a profound prior knowledge of mathematics. It discusses the fundamentals of dimensional analysis, the treatment of temperature-dependent and rheological material values and scale-up where model systems or not available or only partly similar. All this is illustrated by 20 real-world examples, while 25 exercises plus solutions new to this edition practice and monitor learning. The second part presents the individual basic operations and covers the fields of mechanical, thermal, and chemical process engineering with respect to dimensional analysis and scale-up. The rules for scale-up are given and discussed for each operation. Other additions to this second edition are dimensional analysis of pelleting processes, and a historical overview of dimensional

analysis and modeling, while all the chapters have been updated to take the latest literature into account. Written by a specialist with more than 40 years of experience in the industry, this book is specifically aimed at students as well as practicing engineers, chemists and process engineers already working in the field.