

Chemical Reaction Engineering 2nd Edition 4shared

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Chemical Reaction Engineering Prentice Hall

The Omnibook aims to present the main ideas of reactor design in a simple and direct way. It includes key formulas, brief explanations, practice exercises, problems from experience and it skims over the field touching on all sorts of reaction systems. Most important of all it tries to show the reader how to approach the problems of reactor design and what questions to ask. In effect it tries to show that a common strategy threads its way through all reactor problems, a strategy which involves three factors: identifying the flow pattern, knowing the kinetics, and developing the proper performance equation. It is this common strategy which is the heart of Chemical Reaction Engineering and identifies it as a distinct field of study.

Elements of Chemical Reaction Engineering Oxford University Press, USA

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

Chemical Reactor Omnibook- soft cover Elsevier

Chemical Reactor Modeling closes the gap between Chemical Reaction Engineering and Fluid Mechanics. The second edition consists of two volumes: Volume 1: Fundamentals. Volume 2: Chemical Engineering Applications In volume 1 most of the fundamental theory is presented. A few numerical model simulation application examples are given to elucidate the link between theory and applications. In volume 2 the chemical reactor equipment to be modeled are described. Several engineering models are introduced and discussed. A survey of the frequently used numerical methods, algorithms and schemes is provided. A few practical engineering applications of the modeling tools are presented and discussed. The working principles of several experimental techniques employed in order to get data for model validation are outlined. The monograph is based on lectures regularly taught in the fourth and fifth years graduate courses in transport phenomena and chemical reactor modeling and in a post graduate course in modern reactor modeling at the Norwegian University of Science and Technology, Department of Chemical Engineering, Trondheim, Norway. The objective of the book is to present the fundamentals of the single-fluid and multi-fluid models for the analysis of single and multiphase reactive flows in chemical reactors with a chemical reactor engineering rather than mathematical bias. Organized into 13 chapters, it combines theoretical aspects and practical applications and covers some of the recent research in several areas of chemical reactor engineering. This book contains a survey of the modern literature in the field of chemical reactor modeling.

Essentials of Chemical Reaction Engineering, 2nd Edition Courier Corporation

This book serves as an introduction to the subject, giving readers the tools to solve real-world chemical reaction engineering problems. It features a section of fully solved examples as well as end of chapter problems. It includes coverage of catalyst characterization and its impact on kinetics and reactor modeling. Each chapter presents simple ideas and concepts which build towards more complex and realistic cases and situations. Introduces an in-depth kinetics analysis Features well developed sections on the major topics of catalysts, kinetics, reactor design, and modeling Includes a chapter that showcases a fully worked out example detailing a typical problem that is faced when performing laboratory work Offers end of chapter problems and a solutions manual for adopting professors Aimed at advanced chemical engineering undergraduates and graduate students taking chemical reaction engineering courses as well as chemical engineering professionals, this textbook provides the knowledge to tackle real problems within the industry.

Chemical Engineering Design CRC Press

Reaction Engineering clearly and concisely covers the concepts and models of reaction engineering and then applies them to real-world reactor design. The book emphasizes that the foundation of reaction engineering requires the use of kinetics and transport knowledge to explain and analyze reactor behaviors. The authors use readily understandable language to cover the subject, leaving readers with a comprehensive guide on how to understand, analyze, and make decisions related to improving

chemical reactions and chemical reactor design. Worked examples, and over 20 exercises at the end of each chapter, provide opportunities for readers to practice solving problems related to the content covered in the book. Seamlessly integrates chemical kinetics, reaction engineering, and reactor analysis to provide the foundation for optimizing reactions and reactor design Compares and contrasts three types of ideal reactors, then applies reaction engineering principles to real reactor design Covers advanced topics, like microreactors, reactive distillation, membrane reactors, and fuel cells, providing the reader with a broader appreciation of the applications of reaction engineering principles and methods

Chemical Reactor Design and Operation Pearson Education

Chemical process quantitative risk analysis (CPQRA) as applied to the CPI was first fully described in the first edition of this CCPS Guidelines book. This second edition is packed with information reflecting advances in this evolving methodology, and includes worked examples on a CD-ROM. CPQRA is used to identify incident scenarios and evaluate their risk by defining the probability of failure, the various consequences and the potential impact of those consequences. It is an invaluable methodology to evaluate these when qualitative analysis cannot provide adequate understanding and when more information is needed for risk management. This technique provides a means to evaluate acute hazards and alternative risk reduction strategies, and identify areas for cost-effective risk reduction. There are no simple answers when complex issues are concerned, but CPQRA2 offers a cogent, well-illustrated guide to applying these risk-analysis techniques, particularly to risk control studies. Special Details: Includes CD-ROM with example problems worked using Excel and Quattro Pro. For use with Windows 95, 98, and NT.

Elements of Chemical Reaction Engineering CRC Press

Chemical Engineering Design, Second Edition, deals with the application of chemical engineering principles to the design of chemical processes and equipment. Revised throughout, this edition has been specifically developed for the U.S. market. It provides the latest US codes and standards, including API, ASME and ISA design codes and ANSI standards. It contains new discussions of conceptual plant design, flowsheet development, and revamp design; extended coverage of capital cost estimation, process costing, and economics; and new chapters on equipment selection, reactor design, and solids handling processes. A rigorous pedagogy assists learning, with detailed worked examples, end of chapter exercises, plus supporting data, and Excel spreadsheet calculations, plus over 150 Patent References for downloading from the companion website. Extensive instructor resources, including 1170 lecture slides and a fully worked solutions manual are available to adopting instructors. This text is designed for chemical and biochemical engineering students (senior undergraduate year, plus appropriate for capstone design courses where taken, plus graduates) and lecturers/tutors, and professionals in industry (chemical process, biochemical, pharmaceutical, petrochemical sectors). New to this edition: - Revised organization into Part I: Process Design, and Part II: Plant Design. The broad themes of Part I are flowsheet development, economic analysis, safety and environmental impact and optimization. Part II contains chapters on equipment design and selection that can be used as supplements to a lecture course or as essential references for students or practicing engineers working on design projects. - New discussion of conceptual plant design, flowsheet development and revamp design - Significantly increased coverage of capital cost estimation, process costing and economics - New chapters on equipment selection, reactor design and solids handling processes - New sections on fermentation, adsorption, membrane separations, ion exchange and chromatography - Increased coverage of batch processing, food, pharmaceutical and biological processes - All equipment chapters in Part II revised and updated with current information - Updated throughout for latest US codes and standards, including API, ASME and ISA design codes and ANSI standards - Additional worked examples and homework problems - The most complete and up to date coverage of equipment selection - 108 realistic commercial design projects from diverse industries - A rigorous pedagogy assists learning, with detailed worked examples, end of chapter exercises, plus supporting data and Excel spreadsheet calculations plus over 150 Patent References, for downloading from the companion website - Extensive instructor resources: 1170 lecture slides plus fully worked solutions manual available to adopting instructors

Essentials of Chemical Reaction Engineering John Wiley & Sons

Solving problems in chemical reaction engineering and kinetics is now easier than ever! As students read through this text, they'll find a comprehensive, introductory treatment of reactors for single-phase and multiphase systems that exposes them to a broad range of reactors and key design features. They'll gain valuable insight on reaction kinetics in relation to chemical reactor design. They will also utilize a special software package that helps them quickly solve systems of algebraic and differential equations, and perform parameter estimation, which gives them more time for analysis. Key Features Thorough coverage is provided on the relevant principles of kinetics in order to develop better designs of chemical reactors. E-Z Solve software, on CD-ROM, is included with the text. By utilizing this software, students can have more time to focus on the development of design models and on the interpretation of calculated results. The software also facilitates exploration and discussion of realistic, industrial design problems. More than 500 worked examples and end-of-chapter problems are included to help students learn how to apply the theory to solve design problems. A web site, www.wiley.com/college/misener, provides additional resources including sample files, demonstrations, and a description of the E-Z Solve software.

Reaction Kinetics and Reactor Design, Second Edition CRC Press

Today's Definitive, Undergraduate-Level Introduction to Chemical Reaction Engineering Problem-Solving For 30 years, H. Scott Fogler's Elements of Chemical Reaction Engineering has been the #1 selling text for courses in chemical reaction engineering worldwide. Now, in Essentials of Chemical Reaction Engineering, Second Edition, Fogler has distilled this classic into a modern, introductory-level guide specifically for undergraduates. This is the ideal resource for today's students: learners who demand instantaneous access to information and want to enjoy learning as they deepen their critical thinking and creative problem-solving skills. Fogler successfully integrates text, visuals, and computer simulations, and links theory to practice through many relevant examples.

This updated second edition covers mole balances, conversion and reactor sizing, rate laws and stoichiometry, isothermal reactor design, rate data collection/analysis, multiple reactions, reaction mechanisms, pathways, bioreactions and bioreactors, catalysis, catalytic reactors, nonisothermal reactor designs, and more. Its multiple improvements include a new discussion of activation energy, molecular simulation, and stochastic modeling, and a significantly revamped chapter on heat effects in chemical reactors. To promote the transfer of key skills to real-life settings, Fogler presents three styles of problems:

Straightforward problems that reinforce the principles of chemical reaction engineering Living Example Problems (LEPs) that allow students to rapidly explore the issues and look for optimal solutions Open-ended problems that encourage students to use inquiry-based learning to practice creative problem-solving skills About the Web Site (umich.edu/~elements/5e/index.html) The companion Web site offers extensive enrichment opportunities and additional content, including Complete PowerPoint slides for lecture notes for chemical reaction engineering classes Links to additional software, including Polymath, MATLAB,

Wolfram Mathematica, AspenTech, and COMSOL Multiphysics Interactive learning resources linked to each chapter, including Learning Objectives, Summary Notes, Web Modules, Interactive Computer Games, Computer Simulations and Experiments, Solved Problems, FAQs, and links to LearnChemE Living Example Problems that provide more than 75 interactive simulations, allowing students to explore the examples and ask “ what-if ” questions Professional Reference Shelf, containing advanced content on reactors, weighted least squares, experimental planning, laboratory reactors, pharmacokinetics, wire gauze reactors, trickle bed reactors, fluidized bed reactors, CVD boat reactors, detailed explanations of key derivations, and more Problem-solving strategies and insights on creative and critical thinking Register your product at informit.com/register for convenient access to downloads, updates, and/or corrections as they become available.

[Chemical Reactor Design](#) Springer

Appropriate for a one-semester undergraduate or first-year graduate course, this text introduces the quantitative treatment of chemical reaction engineering. It covers both homogeneous and heterogeneous reacting systems and examines chemical reaction engineering as well as chemical reactor engineering. Each chapter contains numerous worked-out problems and real-world vignettes involving commercial applications, a feature widely praised by reviewers and teachers. 2003 edition.

Chemical Reactor Modeling Newnes

The role of the chemical reactor is crucial for the industrial conversion of raw materials into products and numerous factors must be considered when selecting an appropriate and efficient chemical reactor. Chemical Reaction Engineering and Reactor Technology defines the qualitative aspects that affect the selection of an industrial chemical reactor and couples various reactor models to case-specific kinetic expressions for chemical processes. Offering a systematic development of the chemical reaction engineering concept, this volume explores: Essential stoichiometric, kinetic, and thermodynamic terms needed in the analysis of chemical reactors Homogeneous and heterogeneous reactors Residence time distributions and non-ideal flow conditions in industrial reactors Solutions of algebraic and ordinary differential equation systems Gas- and liquid-phase diffusion coefficients and gas-film coefficients Correlations for gas-liquid systems Solubilities of gases in liquids Guidelines for laboratory reactors and the estimation of kinetic parameters The authors pay special attention to the exact formulations and derivations of mass energy balances and their numerical solutions. Richly illustrated and containing exercises and solutions covering a number of processes, from oil refining to the development of specialty and fine chemicals, the text provides a clear understanding of chemical reactor analysis and design.

Introduction to Chemical Reactor Analysis Prentice Hall

This is the Second Edition of the standard text on chemical reaction engineering, beginning with basic definitions and fundamental principles and continuing all the way to practical applications, emphasizing real-world aspects of industrial practice. The two main sections cover applied or engineering kinetics, reactor analysis and design. Includes updated coverage of computer modeling methods and many new worked examples. Most of the examples use real kinetic data from processes of industrial importance.

[Engineering Flow and Heat Exchange](#) Lulu.com

Chemical reaction engineering is concerned with the exploitation of chemical reactions on a commercial scale. It's goal is the successful design and operation of chemical reactors. This text emphasizes qualitative arguments, simple design methods, graphical procedures, and frequent comparison of capabilities of the major reactor types. Simple ideas are treated first, and are then extended to the more complex.

[Chemical Reaction Engineering](#) John Wiley & Sons

Today ' s Definitive, Undergraduate-Level Introduction to Chemical Reaction Engineering Problem-Solving For 30 years, H. Scott Fogler ' s Elements of Chemical Reaction Engineering has been the #1 selling text for courses in chemical reaction engineering worldwide. Now, in Essentials of Chemical Reaction Engineering, Second Edition, Fogler has distilled this classic into a modern, introductory-level guide specifically for undergraduates. This is the ideal resource for today ' s students: learners who demand instantaneous access to information and want to enjoy learning as they deepen their critical thinking and creative problem-solving skills. Fogler successfully integrates text, visuals, and computer simulations, and links theory to practice through many relevant examples. This updated second edition covers mole balances, conversion and reactor sizing, rate laws and stoichiometry, isothermal reactor design, rate data collection/analysis, multiple reactions, reaction mechanisms, pathways, bioreactions and bioreactors, catalysis, catalytic reactors, nonisothermal reactor designs, and more. Its multiple improvements include a new discussion of activation energy, molecular simulation, and stochastic modeling, and a significantly revamped chapter on heat effects in chemical reactors. To promote the transfer of key skills to real-life settings, Fogler presents three styles of problems: Straightforward problems that reinforce the principles of chemical reaction engineering Living Example Problems (LEPs) that allow students to rapidly explore the issues and look for optimal solutions Open-ended problems that encourage students to use inquiry-based learning to practice creative problem-solving skills About the Web Site (umich.edu/~elements/5e/index.html) The companion Web site offers extensive enrichment opportunities and additional content, including Complete PowerPoint slides for lecture notes for chemical reaction engineering classes Links to additional software, including Polymath, MATLAB, Wolfram Mathematica, AspenTech, and COMSOL Multiphysics Interactive learning resources linked to each chapter, including Learning Objectives, Summary Notes, Web Modules, Interactive Computer Games, Computer Simulations and Experiments, Solved Problems, FAQs, and links to LearnChemE Living Example Problems that provide more than 75 interactive simulations, allowing students to explore the examples and ask “ what-if ” questions Professional Reference Shelf, containing a...

[Bioprocess Engineering](#) John Wiley & Sons

Learn Chemical Reaction Engineering through Reasoning, Not Memorization Essentials of Chemical Reaction Engineering is a complete yet concise, modern introduction to chemical reaction engineering for undergraduate students. While the classic Elements of Chemical Reaction Engineering, Fourth Edition, is still available, H. Scott Fogler distilled that larger text into this volume of essential topics 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, 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. Coverage includes Crucial safety topics, including ammonium nitrate CSTR explosions, nitroaniline and T2 Laboratories batch reactor runaways, and SACHe/CCPS resources Greater emphasis on safety: following the recommendations of the Chemical Safety Board (CSB) 2 case studies from plant explosions and two homework problems which discuss another explosion. Solar energy conversions: chemical, thermal, and catalytic water spilling Algae production for biomass Mole balances: batch, continuous-flow, and industrial reactors Conversion and reactor sizing: design equations, reactors in series, and more Rate laws and stoichiometry Isothermal reactor design: conversion and molar flow rates Collection and analysis of rate data Multiple reactions: parallel, series, and complex reactions; membrane reactors; and more Reaction mechanisms, pathways, bioreactions, and bioreactors Catalysis and catalytic reactors Nonisothermal reactor design: steady-state energy balance and adiabatic PFR applications Steady-state nonisothermal reactor design: flow reactors with heat exchange

Chemical Reaction Engineering and Reactor Technology Pearson Education

Monomers composed of carbon and hydrogen atoms are the simple building blocks that make up polyolefins - molecules which are extremely useful and which have an extraordinary range of properties and applications. How these monomer molecules are connected in the polymer chain defines the molecular architecture of polyolefins. Written by two world-renowned authors pooling their experience from industry and academia, this book adopts a unique engineering approach using elegant mathematical modeling techniques to relate polymerization conditions, reactor and catalyst type to polyolefin properties. Readers thus learn how to design and optimize polymerization conditions to produce polyolefins with a given microstructure, and how different types of reactors and processes are used to create the different products. Aimed at polymer chemists, plastics technologists, process engineers, the plastics industry, chemical engineers, materials scientists, and company libraries.

[Essentials of Chemical Reaction Engineering](#) CRC Press

This text combines a description of the origin and use of fundamental chemical kinetics through an assessment of realistic reactor problems with an expanded discussion of kinetics and its relation to chemical thermodynamics. It provides exercises, open-ended situations drawing on creative thinking, and worked-out examples. A solutions manual is also available to instructors.

Elements of Chemical Reaction Engineering New York ; Toronto : J. Wiley

A comprehensive introduction to chemical engineering kinetics Providing an introduction to chemical engineering kinetics and describing the empirical approaches that have successfully helped engineers describe reacting systems, An Introduction to Chemical Engineering Kinetics & Reactor Design is an excellent resource for students of chemical engineering. Truly introductory in nature, the text emphasizes those aspects of chemical kinetics and material and energy balances that form the broad foundation for understanding reactor design. For those seeking an introduction to the subject, the book provides a firm and lasting foundation for continuing study and practice.

Polyolefin Reaction Engineering CRC Press

This second, extended and updated edition presents the current state of kinetics of chemical reactions, combining basic knowledge with results recently obtained at the frontier of science. Special attention is paid to the problem of the chemical reaction complexity with theoretical and methodological concepts illustrated throughout by numerous examples taken from heterogeneous catalysis combustion and enzyme processes. Of great interest to graduate students in both chemistry and chemical engineering.

Chemical Reactor Analysis and Design Pearson Education

This book illustrates how models of chemical reactors are built up in a systematic manner, step by step. The authors also outline how the numerical solution algorithms for reactor models are selected, as well as how computer codes are written for numerical performance, with a focus on MATLAB and Fortran. Examples solved in MATLAB and simulations performed in Fortran are included for demonstration purposes.