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Chemical Reaction Engineering-Octave Levenspiel 2019-12-12 Chemical reaction engineering is concerned with the exploitation of chemical reactions on a commercial scale. Its 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.

Solutions to All 175 Odd Numbered Problems in Second Edition of Chemical Reaction Engineering-Octave Levenspiel 1972

Elements of Chemical Reaction Engineering-H. Scott Fogler 2013-07-29 The book presents in a clear and concise manner the fundamentals of chemical reaction engineering. The structure of the book allows the student to solve reaction engineering problems through reasoning rather than through memorization and recall of numerous equations, restrictions, and conditions under which each equation applies. The fourth edition contains more industrial chemistry with real reactors and real engineering and extends the wide range of applications to which chemical reaction engineering principles can be applied (i.e., cobra bites, medications, ecological engineering)

Tracer Technology-Octave Levenspiel 2011-11-18 The tracer method was first introduced to measure the actual flow of fluid in a vessel, and then to develop a suitable model to represent this flow. Such models are used to follow the flow of fluid in chemical reactors and other process units, in rivers and streams, and through soils and porous structures. Also, in medicine they are used to study the flow of chemicals, harmful or not, in the blood streams of animals and man. Tracer Technology, written by Octave Levenspiel, shows how we use tracers to follow the flow of fluids and then we develop a variety of models to represent these flows. This activity is called tracer technology.

Engineering Flow and Heat Exchange-Octave Levenspiel 2014-11-26 The third edition of Engineering Flow and Heat Exchange is the most practical textbook available on the design of heat transfer and equipment. This book is an excellent introduction to real-world applications for advanced undergraduates and an indispensable reference for professionals. The book includes comprehensive chapters on the different types and classifications of fluids, how to analyze fluids, and where a particular fluid fits into a broader picture. This book includes various a wide variety of problems and solutions - some whimsical and others directly from industrial applications. Numerous practical examples of heat transfer Different from other introductory books on fluids Clearly written, simple to understand, written for students to absorb material quickly Discusses non-Newtonian as well as Newtonian fluids Covers the entire field concisely Solutions

manual with worked examples and solutions provided

Solutions Manual to Accompany Chemical Reaction Engineering-Octave Levenspiel 1998-07-01

Chemical Reaction Engineering-Octave Levenspiel 1962

Fundamentals of Chemical Reaction Engineering-Mark E. Davis 2013-05-27 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.

Introduction to Chemical Reaction Engineering and Kinetics-Ronald W. Missen 1999 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/missen, provides additional resources including sample files, demonstrations, and a description of the E-Z Solve software.

The Engineering of Chemical Reactions-Lanny D. Schmidt 1998 Employment opportunities for chemical engineers are moving away from petroleum and petrochemicals toward new applications such as materials processing, pharmaceuticals, and foods. Chemical reactors remain at the center of any chemical process; they are essential to improving existing processes and to designing new ones. Today and in the future chemical engineers must be able to use their knowledge of reactors in combination with other skills in order to think creatively and strategically about new processes and growing applications. The Engineering of Chemical Reactions addresses these issues by focusing on the analysis of chemical reactors while simultaneously providing a description of industrial chemical processes and the strategies by which they operate. Ideal for upper-level undergraduate courses in chemical reactor engineering and kinetics, this text provides a concise, up-to-date alternative to similar texts. In addition to the analysis of simple chemical reactors, it considers more complex situations such as multistage reactors and reactor-separation systems. Energy management and the role of mass transfer in chemical reactors are also integrated into the text. The evolution of chemical engineering from petroleum refining, through petrochemicals and polymers, to new applications is described so that students can see the relationships between past, present, and future technologies. Applications such as catalytic processes, environmental modeling, biological reactions, reactions involving solids, oxidation, combustion, safety, polymerization, and multiphase reactors are also described. The text uses a notation of reaction stoichiometry and reactor mass balances which is kept simple so that students can see the principles of reactor design without becoming lost in complex special cases. Numerical methods are used throughout to consider more complex problems. Worked examples are given throughout the text, and over 300 homework problems are included. Both the examples and problems cover real-world chemistry and kinetics.

Introduction to Chemical Engineering Kinetics and Reactor Design-Charles G. Hill 2014-04-24 The Second Edition features new problems that engage readers in contemporary reactor design Highly praised by instructors, students, and chemical engineers, Introduction to Chemical Engineering Kinetics & Reactor Design has been extensively revised and updated in this Second Edition. The text continues to offer a solid background in chemical reaction kinetics as well as in material and energy balances, preparing readers with the foundation necessary for success in the design of chemical reactors. Moreover, it reflects not only the basic engineering science, but also the mathematical tools used by today's engineers to solve problems associated with the design of chemical reactors. Introduction to Chemical Engineering Kinetics & Reactor Design enables readers to progressively build their knowledge and skills by applying the laws of conservation of mass and energy to increasingly more difficult challenges in reactor design. The first one-third of the text emphasizes general principles of

chemical reaction kinetics, setting the stage for the subsequent treatment of reactors intended to carry out homogeneous reactions, heterogeneous catalytic reactions, and biochemical transformations. Topics include: Thermodynamics of chemical reactions Determination of reaction rate expressions Elements of heterogeneous catalysis Basic concepts in reactor design and ideal reactor models Temperature and energy effects in chemical reactors Basic and applied aspects of biochemical transformations and bioreactors About 70% of the problems in this Second Edition are new. These problems, frequently based on articles culled from the research literature, help readers develop a solid understanding of the material. Many of these new problems also offer readers opportunities to use current software applications such as Mathcad and MATLAB®. By enabling readers to progressively build and apply their knowledge, the Second Edition of Introduction to Chemical Engineering Kinetics & Reactor Design remains a premier text for students in chemical engineering and a valuable resource for practicing engineers.

Reaction Engineering-Shaofen Li 2017-07-14 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

A Step by Step Approach to the Modeling of Chemical Engineering Processes-Liliane Maria Ferrareso Lona 2017-12-15 This book treats modeling and simulation in a simple way, that builds on the existing knowledge and intuition of students. They will learn how to build a model and solve it using Excel. Most chemical engineering students feel a shiver down the spine when they see a set of complex mathematical equations generated from the modeling of a chemical engineering system. This is because they usually do not understand how to achieve this mathematical model, or they do not know how to solve the equations system without spending a lot of time and effort. Trying to understand how to generate a set of mathematical equations to represent a physical system (to model) and solve these equations (to simulate) is not a simple task. A model, most of the time, takes into account all phenomena studied during a Chemical Engineering course. In the same way, there is a multitude of numerical methods that can be used to solve the same set of equations generated from the modeling, and many different computational languages can be adopted to implement the numerical methods. As a consequence of this comprehensiveness and combinatorial explosion of possibilities, most books that deal with this subject are very extensive and embracing, making need for a lot of time and effort to go through this subject. It is expected that with this book the chemical engineering student and the future chemical engineer feel motivated to solve different practical problems involving chemical processes, knowing they can do that in an easy and fast way, with no need of expensive software.

Chemical Reactor Analysis and Design-Gilbert F. Froment 1990-01-16 This detailed text in modelling, simulation and design of the various chemical reactors for chemical and petroleum refining industries includes topics such as basic elements and kinetics, heat, mass and momentum transfer. It also deals with major types of reactors encountered in industry and provides examples of rigorous modelling applications to real-life problems. Also featured is a quantitative approach to catalyst deactivation by coke, a chapter on fixed bed reactor modelling, simulation and design, and kinetic models for homogeneous and heterogeneous processes and modelling equations for reactors.

The Chemical Reactor Omnibook-Octave Levenspiel 1993

Chemical Reaction Engineering-Tapio Salmi 2020-03-23 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.

Physical and Chemical Equilibrium for Chemical Engineers-Noel de Nevers 2012-03-20 Suitable for undergraduates, postgraduates and professionals, this is a comprehensive text on physical and chemical equilibrium. De Nevers is also the author of Fluid Mechanics for Chemical Engineers.

Ozone Reaction Kinetics for Water and Wastewater Systems-Fernando J. Beltran 2003-12-29 Interest in ozonation for drinking water and wastewater treatment has soared in recent years due to ozone's potency as a disinfectant, and the increasing need to control disinfection byproducts that arise from the chlorination of water and wastewater. Ozone Reaction Kinetics for Water and Wastewater Systems is a comprehensive reference that

Chemical Reaction Engineering and Reactor Technology, Second Edition-Tapio O. Salmi 2019-07-11 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. Thoroughly revised and updated, this much-anticipated Second Edition addresses the rapid academic and industrial development of chemical reaction engineering. 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 reactor optimization aspects 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.

CEE. Chemical Engineering Education- 1984

Chemical Kinetics and Reaction Dynamics-Paul L. Houston 2012-10-10 DIVThis text teaches the principles underlying modern chemical kinetics in a clear, direct fashion, using several examples to enhance basic understanding. Solutions to selected problems. 2001 edition. /div

CHEMICAL REACTION ENGINEERING, 3RD ED-Levenspiel 2006 Market_Desc: · Chemical Engineers in Chemical, Nuclear and Biomedical Industries Special Features: · Emphasis is placed throughout on the development of common design strategy for all systems, homogeneous and heterogeneous· This edition features new topics on biochemical systems, reactors with fluidized solids, gas/liquid reactors, and more on non ideal flow· The book explains why certain assumptions are made, why an alternative approach is not used, and to indicate the limitations of the treatment when applied to real situations About The Book: Chemical reaction engineering is concerned with the exploitation of chemical reactions on a commercial scale. Its 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.

Mathematical Modeling in Chemical Engineering-Anders Rasmuson 2014-03-20 A solid introduction, enabling the reader to successfully formulate, construct, simplify, evaluate and use mathematical models in chemical engineering.

Chemical Kinetics-Kenneth Antonio Connors 1990 Chemical Kinetics The Study of Reaction Rates in Solution Kenneth A. Connors This chemical kinetics book blends physical theory, phenomenology and empiricism to provide a guide to the experimental practice and interpretation of reaction kinetics in solution. It is suitable for courses in chemical kinetics at the graduate and advanced undergraduate levels. This book will appeal to students in physical organic chemistry, physical inorganic chemistry, biophysical chemistry, biochemistry, pharmaceutical chemistry and water chemistry all fields concerned with the rates of chemical reactions in the solution phase.

Essentials of Chemical Reaction Engineering-H. Scott Fogler 2011 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.

Chemical Reactor Design and Technology-Hugo de Lasa 2012-12-06 Today's frustrations and anxieties resulting from two energy crises in only one decade, show us the problems and fragility of a world built on high energy consumption, accustomed to the use of cheap non-renewable energy and to the acceptance of existing imbalances between the resources and demands of countries. Despite all these stressing factors, our world is still hesitating about the urgency of undertaking new and decisive research that could stabilize our future, Could this trend change in the near future? In our view, two different scenarios are possible. A renewed energy tension could take place with an unpredictable timing mostly related to political and economic factors, This could bring again scientists and technologists to a new state of shock and awaken our talents, A second interesting and beneficial scenario could result from the positive influence of a new generation of researchers that with or without immediate crisis, acting both in industry and academia, will face the challenge of developing technologies and processes to pave the way to a less vulnerable society, Because Chemical Reactor Design and Technology activities are at the heart of these required new technologies the timeliness of the NATO-Advanced Study Institute at the University of Western Ontario, London, was very appropriate.

Modeling of Chemical Kinetics and Reactor Design-A. Kayode Coker 2001 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

Chemical Reactor Analysis and Design Fundamentals-James Blake Rawlings 2012

Assessment of Treatment Plant Performance and Water Quality Data: A Guide for Students, Researchers and Practitioners-Marcos von Sperling 2020-01-15 This book presents the basic principles for evaluating water quality and treatment plant performance in a clear, innovative and didactic way, using a combined approach that involves the interpretation of monitoring data associated with (i) the basic processes that take place in water bodies and in water and wastewater treatment plants and (ii) data management and statistical calculations to allow a deep interpretation of the data. This book is problem-oriented and works from

practice to theory, covering most of the information you will need, such as (a) obtaining flow data and working with the concept of loading, (b) organizing sampling programmes and measurements, (c) connecting laboratory analysis to data management, (e) using numerical and graphical methods for describing monitoring data (descriptive statistics), (f) understanding and reporting removal efficiencies, (g) recognizing symmetry and asymmetry in monitoring data (normal and log-normal distributions), (h) evaluating compliance with targets and regulatory standards for effluents and water bodies, (i) making comparisons with the monitoring data (tests of hypothesis), (j) understanding the relationship between monitoring variables (correlation and regression analysis), (k) making water and mass balances, (l) understanding the different loading rates applied to treatment units, (m) learning the principles of reaction kinetics and reactor hydraulics and (n) performing calibration and verification of models. The major concepts are illustrated by 92 fully worked-out examples, which are supported by 75 freely-downloadable Excel spreadsheets. Each chapter concludes with a checklist for your report. If you are a student, researcher or practitioner planning to use or already using treatment plant and water quality monitoring data, then this book is for you! 75 Excel spreadsheets are available to download.

Chemical and Catalytic Reaction Engineering-James J. Carberry 2001-01-01 Designed to give chemical engineers background for managing chemical reactions, this text examines the behavior of chemical reactions and reactors; conservation equations for reactors; heterogeneous reactions; fluid-fluid and fluid-solid reaction systems; heterogeneous catalysis and catalytic kinetics; diffusion and heterogeneous catalysis; and analyses and design of heterogeneous reactors. 1976 edition.

Unit Operations of Chemical Engineering-Warren Lee McCabe 1967

Engineering and Chemical Thermodynamics-Milo D. Koretsky 2012-12-17 Chemical engineers face the challenge of learning the difficult concept and application of entropy and the 2nd Law of Thermodynamics. By following a visual approach and offering qualitative discussions of the role of molecular interactions, Koretsky helps them understand and visualize thermodynamics. Highlighted examples show how the material is applied in the real world. Expanded coverage includes biological content and examples, the Equation of State approach for both liquid and vapor phases in VLE, and the practical side of the 2nd Law. Engineers will then be able to use this resource as the basis for more advanced concepts.

Basic Principles and Calculations in Chemical Engineering-David Mautner Himmelblau 2012 Best-selling introductory chemical engineering book - now updated with far more coverage of biotech, nanotech, and green engineering

- Thoroughly covers material balances, gases, liquids, and energy balances.
- Contains new biotech and bioengineering problems throughout.
- Adds new examples and homework on nanotechnology, environmental engineering, and green engineering.
- All-new student projects chapter.
- Self-assessment tests, discussion problems, homework, and glossaries in each chapter.

Basic Principles and Calculations in Chemical Engineering, 8/e, provides a complete, practical, and student-friendly introduction to the principles and techniques of modern chemical, petroleum, and environmental engineering. The authors introduce efficient and consistent methods for solving problems, analyzing data, and conceptually understanding a wide variety of processes. This edition has been revised to reflect growing interest in the life sciences, adding biotechnology and bioengineering problems and examples throughout. It also adds many new examples and homework assignments on nanotechnology, environmental, and green engineering, plus many updates to existing examples. A new chapter presents multiple student projects, and several chapters from the previous edition have been condensed for greater focus. This text's features include:

- Thorough introductory coverage, including unit conversions, basis selection, and process measurements.
- Short chapters supporting flexible, modular learning.
- Consistent, sound strategies for solving material and energy balance problems.
- Key concepts ranging from stoichiometry to enthalpy.
- Behavior of gases, liquids, and solids.
- Many tables, charts, and reference appendices.
- Self-assessment tests, thought/discussion problems, homework problems, and glossaries in each chapter.

Gas-Solid Reactions-Julian Szekey 2012-12-02 Gas-Solid Reactions describes gas-solid reaction systems, focusing on the four phenomena—external mass transfer, pore diffusion, adsorption/desorption, and chemical reaction. This book consists of eight chapters. After the introduction provided in Chapter 1, the basic components of gas-solid reactions are reviewed in Chapter 2. Chapter 3 describes the reactions of individual nonporous solid particles, while Chapter 4 elaborates the reaction of single porous particles. Solid-solid reactions proceeding through gaseous intermediates are considered in Chapter 5. Chapter 6 deals with the experimental approaches to the study of gas-solid reaction systems. How information on single-particle behavior may be used for the design of multiparticle, large-scale assemblies, and packed- and fluidized-bed reaction systems is deliberated in Chapter 7. The last chapter covers the specific gas-solid

reaction systems, including some statistical indices indicating the economic importance of the systems and processes it's based on. This publication is recommended for practicing engineers engaged in process research, development, and design in the many fields where gas-solid reactions are important.

Chemical Reactor Omnibook Plus-Octave Levenspiel 1984-01-01

Rare Metal Technology 2016-Shafiq Alam 2016-02-16 This collection presents the papers presented in the symposium on extraction of rare metals as well as rare extraction processing techniques used in metal production. Paper topics include the extraction and processing of elements like antimony, arsenic, gold, indium, palladium, platinum, rare earth metals including yttrium and neodymium, titanium, tungsten, and vanadium. The rare processing techniques covered include direct extraction process for rare earth element recovery; biosorption of precious metals; fluorination behavior of uranium and zirconium mixture of fuel debris treatment; and recovery of valuable components of commodity metals such as zinc, nickel, and metals from slag.

Industrial Crystallization-Narayan S. Tavare 2013-11-11 Incorporating all recent developments and applications of crystallization technology, this volume offers a clear account of the field's underlying principles, reviews of past and current research, and provides guidelines for equipment and process design. The book takes a balanced functional approach in its critical survey of research literature, and includes several problems based on real practical situations that illustrate theoretical development. Several new concepts and techniques used in process simulation and identification analysis are featured.

The Chemical Reactor from Laboratory to Industrial Plant-Elio Santacesaria 2018-11-04 This graduate textbook, written by a former lecturer, addresses industrial chemical reaction topics, focusing on the commercial-scale exploitation of chemical reactions. It introduces students to the concepts behind the successful design and operation of chemical reactors, with an emphasis on qualitative arguments, simple design methods, graphical procedures, and frequent comparison of capabilities of the major reactor types. It starts by discussing simple ideas before moving on to more advanced concepts with the support of numerous case studies. Many simple and advanced exercises are present in each chapter and the detailed MATLAB code for their solution is available to the reader as supplementary material on Springer website. It is written for MSc chemical engineering students and novice researchers working in industrial laboratories.

Transport Phenomena for Chemical Reactor Design-Laurence A. Belfiore 2003-07-04 Laurence Belfiore's unique treatment meshes two mainstream subject areas in chemical engineering: transport phenomena and chemical reactor design. Expressly intended as an extension of Bird, Stewart, and Lightfoot's classic Transport Phenomena, and Froment and Bischoff's Chemical Reactor Analysis and Design, Second Edition, Belfiore's unprecedented text explores the synthesis of these two disciplines in a manner the upper undergraduate or graduate reader can readily grasp. Transport Phenomena for Chemical Reactor Design approaches the design of chemical reactors from microscopic heat and mass transfer principles. It includes simultaneous consideration of kinetics and heat transfer, both critical to the performance of real chemical reactors. Complementary topics in transport phenomena and thermodynamics that provide support for chemical reactor analysis are covered, including: Fluid dynamics in the creeping and potential flow regimes around solid spheres and gas bubbles The corresponding mass transfer problems that employ velocity profiles, derived in the book's fluid dynamics chapter, to calculate interphase heat and mass transfer coefficients Heat capacities of ideal gases via statistical thermodynamics to calculate Prandtl numbers Thermodynamic stability criteria for homogeneous mixtures that reveal that binary molecular diffusion coefficients must be positive In addition to its comprehensive treatment, the text also contains 484 problems and ninety-six detailed solutions to assist in the exploration of the subject. Graduate and advanced undergraduate chemical engineering students, professors, and researchers will appreciate the vision, innovation, and practical application of Laurence Belfiore's Transport Phenomena for Chemical Reactor Design.

Handbook of Industrial Mixing-Edward L. Paul 2004-02-17 Handbook of Industrial Mixing will explain the difference and use of a variety of mixers including gear mixers, top entry mixers, side entry mixers, bottom entry mixers, on-line mixers, and submerged mixers The Handbook discusses the trade-offs among various mixers, concentrating on which might be considered for a particular process. Handbook of Industrial Mixing explains industrial mixers in a clear concise manner, and also: * Contains a CD-ROM with video clips showing different type of mixers in action and a overview of their uses. * Gives practical insights by the top professional in the field. * Details applications in key industries. * Provides the professional with information he did receive in school

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