

Chemical Reaction Engineering

Octave Levenspiel

Note: This is not the actual book cover

Chemical Reaction Engineering An Introduction To The Design Of Chemical Reactors

Charles G. Hill



Chemical Reaction Engineering An Introduction To The Design Of Chemical Reactors:

Chemical Reaction Engineering Octave Levenspiel, 1962 **Chemical reaction engineering** Octave Levenspiel, 1966

Chemical Reaction Engineering Octave Levenspiel, 1972-07-14 An improved and simplified edition of this classic introduction to the principles of reactor design for chemical reactions of all types homogeneous catalytic biochemical gas solid extractive etc Adds new material on systems of deactivating catalysts flow modeling and diagnosis of the ills of operating equipment and new simple design procedures for packed bed and fluidized bed reactors *Introduction to Chemical Engineering Kinetics and Reactor Design* Charles G. Hill, Thatcher W. Root, 2014-05-27 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 *Introduction to Chemical Reactor Analysis* R.E. Hayes, J.P. Mmbaga, 2012-10-05 *Introduction to Chemical Reactor Analysis* Second Edition introduces the basic concepts of chemical reactor analysis and design an important foundation for understanding chemical reactors which play a central role in most industrial chemical plants The scope of the second edition has been significantly enhanced and the content reorganized for it **Introduction to Chemical Reaction Engineering and Kinetics** Ronald W. Missen, Charles A. Mims, Bradley A. Saville, 1999 Solving problems in chemical reaction engineering and kinetics is now easier than ever As students read through this text they will 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

An Introduction to Chemical Engineering Kinetics and Reactor Design Charles G. Hill, 1977-10-13 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

Essentials of Chemical Reaction Engineering H. Scott Fogler, 2010-11-02 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

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Chemical Reaction Engineering and Reactor

Technology Tapio O. Salmi, Jyri-Pekka Mikkola, Johan P. Warna, 2011-07-01 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, Second Edition R.E. Hayes, J.P. Mmbaga, 2012-10-05

Introduction to Chemical Reactor Analysis Second Edition introduces the basic concepts of chemical reactor analysis and design an important foundation for understanding chemical reactors which play a central role in most industrial chemical plants The scope of the second edition has been significantly enhanced and the content reorganized for improved pedagogical value containing sufficient material to be used as a text for an undergraduate level two term course This edition also contains five new chapters on catalytic reaction engineering Written so that newcomers to the field can easily progress through the topics this text provides sufficient knowledge for readers to perform most of the common reaction engineering calculations required for a typical practicing engineer The authors introduce kinetics reactor types and commonly used terms in the first chapter Subsequent chapters cover a review of chemical engineering thermodynamics mole balances in ideal reactors for three common reactor types energy balances in ideal reactors and chemical reaction kinetics The text also presents an introduction to nonideal reactors and explores kinetics and reactors in catalytic systems The book assumes that readers have some knowledge of thermodynamics numerical methods heat transfer and fluid flow The authors include an appendix for numerical methods which are essential to solving most realistic problems in chemical reaction engineering They also provide numerous worked examples and additional problems in each chapter Given the significant number of chemical

engineers involved in chemical process plant operation at some point in their careers this book offers essential training for interpreting chemical reactor performance and improving reactor operation What s New in This Edition Five new chapters on catalytic reaction engineering including various catalytic reactions and kinetics transport processes and experimental methods Expanded coverage of adsorption Additional worked problems Reorganized material

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