

Distillation Tray Fundamentals

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Reactive Distillation - Kai Sundmacher 2006-08-21
In a reactive distillation column, both the chemical conversion and the distillative separation of the product mixture are carried out simultaneously. Through this integrative strategy, chemical equilibrium limitations can be overcome, higher selectivities can be achieved and heat of reaction can be directly used for distillation. Increased process efficiency and reduction of

investments and operational costs are the direct results of this approach. Highly renowned international experts from both industry and academia review the state-of-the-art and the future directions in application, design, analysis and control of Reactive Distillation processes. Part I surveys various industrial applications and covers both established large scale processes as well as new chemical reaction schemes with high future potential. Part II

provides the vital details for analysis of reactive phase equilibria, and discusses the importance of chemical reaction kinetics, while Part III focuses on identifying feasible column configurations and designing their internal structure. Analysis and control of the complex dynamic and steady-state behavior of reactive distillation processes are described in Part IV. Reactive Distillation - a very promising alternative to conventional reaction-distillation flow schemes.

Multicomponent Mass

Transfer - Ross Taylor
1993-12-16

Addresses the use of rigorous multicomponent mass transfer models for the simulation and design of process equipment. Deals with the basic equations of diffusion in multicomponent systems. Describes various models and estimations of rates of mass and energy transfer. Covers applications of multicomponent mass transfer models to process design. Includes appendices providing necessary mathematical

background. Contains a large number of numerical examples worked out in detail.

Chemical Engineering

Design - Gavin Towler
2012-01-25

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

PRINCIPLES OF MASS TRANSFER AND SEPERATION PROCESSES -
BINAY K. DUTTA 2007-01-21

This textbook is targetted to undergraduate students in chemical engineering, chemical technology, and biochemical engineering for courses in mass transfer, separation processes, transport processes, and unit operations. The principles of mass transfer, both diffusional and convective have been comprehensively discussed. The application of these principles to separation processes is explained. The more common separation processes used in the chemical industries are individually described in separate chapters. The book also provides a good understanding of the construction, the operating principles, and the selection

criteria of separation equipment. Recent developments in equipment have been included as far as possible. The procedure of equipment design and sizing has been illustrated by simple examples. An overview of different applications and aspects of membrane separation has also been provided. 'Humidification and water cooling', necessary in every process indus-try, is also described. Finally, elementary principles of 'unsteady state diffusion' and mass transfer accompanied by a chemical reaction are covered.

SALIENT FEATURES :

- A balanced coverage of theoretical principles and applications.
- Important recent developments in mass transfer equipment and practice are included.
- A large number of solved problems of varying levels of complexities showing the applications of the theory are included.
- Many end-chapter exercises.
- Chapter-wise multiple choice questions.
- An Instructors manual for the teachers.

Distillation Control,

Optimization, and Tuning -

Lanny Robbins 2016-04-19

With a focus on the fundamentals and strategies of distillation columns, this book covers the process variables for continuous distillation columns, as well as four basic control strategies and the typical cases in which they are used. The author defines the inlet and outlet streams and process variables for a distillation column and then explains the overall concept of the separation and purification that is performed. Performance and product quality are described in terms of specification requirements, and tools and techniques for the optimization of quality performance are provided. Figures and graphs are included within the reference to illustrate concepts.

Chemical Synergies -

Nuno A.G. Bandeira 2018-05-07

This book gives an overview of recent integrated and interdisciplinary approaches between chemical experiment and theory in a variety of fields, from polymer science to materials chemistry and

ranging from the design of tailored properties to catalysis and reactivity, building on the well-established success of Density Functional Theory as the foremost quantum chemical method to provide qualitative and quantitative interpretation of results from the chemical laboratory. The combination of several characterization techniques with an understanding at the molecular level of chemical and physical phenomena are the main focal point of the subject matter.

Separation Process Principles -

J. D. Seader 2016-01-20

Separation Process Principles with Applications Using Process Simulator, 4th Edition is the most comprehensive and up-to-date treatment of the major separation operations in the chemical industry. The 4th edition focuses on using process simulators to design separation processes and prepares readers for professional practice. Completely rewritten to enhance clarity, this fourth edition provides engineers with a strong understanding of the

field. With the help of an additional co-author, the text presents new information on bioseparations throughout the chapters. A new chapter on mechanical separations covers settling, filtration and centrifugation including mechanical separations in biotechnology and cell lysis. Boxes help highlight fundamental equations. Numerous new examples and exercises are integrated throughout as well.

Distillation Design - Henry Z. Kister 1992-02-22

Providing coverage of design principles for distillation processes, this text contains a presentation of process and equipment design procedures. It also highlights limitations of some design methods, and offers guidance on how to overcome them.

Hydroprocessing for Clean Energy - Frank (Xin X.) Zhu 2017-01-04

Provides a holistic approach that looks at changing process conditions, possible process design changes, and process technology upgrades Includes

process integration techniques for improving process designs and for applying optimization techniques for improving operations focusing on hydroprocessing units. Discusses in details all important aspects of hydroprocessing – including catalytic materials, reaction mechanism, as well as process design, operation and control, troubleshooting and optimization Methods and tools are introduced that have a successful application track record at UOP and many industrial plants in recent years Includes relevant calculations/software/technologies hosted online for purchasers of the book

Distillation - Johann G. Stichlmair 2021-05-07

Distillation Principles and Practice Second Edition covers all the main aspects of distillation including the thermodynamics of vapor/liquid equilibrium, the principles of distillation, the synthesis of distillation processes, the design of the equipment, and the control of process

operation. Most textbooks deal in detail with the principles and laws of distilling binary mixtures. When it comes to multi-component mixtures, they refer to computer software nowadays available. One of the special features of the second edition is a clear and easy understandable presentation of the principles and laws of ternary distillation. The right understanding of ternary distillation is the link to a better understanding of multi-component distillation. Ternary distillation is the basis for a conceptual process design, for separating azeotropic mixtures by using an entrainer, and for reactive distillation, which is a rapidly developing field of distillation. Another special feature of the book is the design of distillation equipment, i.e. tray columns and packed columns. In practice, empirical know-how is preferably used in many companies, often in form of empirical equations, which are not even dimensionally correct. The objective of the proposed book is the derivation of the relevant equations for

column design based on first principles. The field of column design is permanently developing with respect to the type of equipment used and the know-how of two-phase flow and interfacial mass transfer. [Encyclopedia of Chemical Processing \(Online\)](#) - Sunggyu Lee 2005-11-01

This second edition Encyclopedia supplies nearly 350 gold standard articles on the methods, practices, products, and standards influencing the chemical industries. It offers expertly written articles on technologies at the forefront of the field to maximize and enhance the research and production phases of current and emerging chemical manufacturing practices and techniques. This collecting of information is of vital interest to chemical, polymer, electrical, mechanical, and civil engineers, as well as chemists and chemical researchers. A complete reconceptualization of the classic reference series the Encyclopedia of Chemical Processing and Design, whose

first volume published in 1976, this resource offers extensive A-Z treatment of the subject in five simultaneously published volumes, with comprehensive indexing of all five volumes in the back matter of each tome. It includes material on the design of key unit operations involved with chemical processes; the design, unit operation, and integration of reactors and separation systems; process system peripherals such as pumps, valves, and controllers; analytical techniques and equipment; and pilot plant design and scale-up criteria. This reference contains well-researched sections on automation, equipment, design and simulation, reliability and maintenance, separations technologies, and energy and environmental issues. Authoritative contributions cover chemical processing equipment, engineered systems, and laboratory apparatus currently utilized in the field. It also presents expert overviews on key engineering science topics in property

predictions, measurements and analysis, novel materials and devices, and emerging chemical fields. ALSO AVAILABLE ONLINE This Taylor & Francis encyclopedia is also available through online subscription, offering a variety of extra benefits for both researchers, students, and librarians, including: Citation tracking and alerts Active reference linking Saved searches and marked lists HTML and PDF format options Contact Taylor and Francis for more information or to inquire about subscription options and print/online combination packages. US: (Tel) 1.888.318.2367; (E-mail) e-reference@taylorandfrancis.com International: (Tel) +44 (0) 20 7017 6062; (E-mail) online.sales@tandf.co.uk

Separation Process Engineering - Phillip C. Wankat 2006-08-11
The Comprehensive Introduction to Standard and Advanced Separation for Every Chemical Engineer Separation Process Engineering, Second Edition helps readers

thoroughly master both standard equilibrium staged separations and the latest new processes. The author explains key separation process with exceptional clarity, realistic examples, and end-of-chapter simulation exercises using Aspen Plus. The book starts by reviewing core concepts, such as equilibrium and unit operations; then introduces a step-by-step process for solving separation problems. Next, it introduces each leading processes, including advanced processes such as membrane separation, adsorption, and chromatography. For each process, the author presents essential principles, techniques, and equations, as well as detailed examples. Separation Process Engineering is the new, thoroughly updated edition of the author's previous book, Equilibrium Staged Separations. Enhancements include improved organization, extensive new coverage, and more than 75% new homework problems, all tested in the author's Purdue University classes. Coverage includes

Detailed problems with real data, organized in a common format for easier understanding Modular simulation exercises that support courses taught with simulators without creating confusion in courses that do not use them Extensive new coverage of membrane separations, including gas permeation, reverse osmosis, ultrafiltration, pervaporation, and key applications A detailed introduction to adsorption, chromatography and ion exchange: everything students need to understand advanced work in these areas Discussions of standard equilibrium stage processes, including flash distillation, continuous column distillation, batch distillation, absorption, stripping, and extraction

Distillation: Fundamentals and Principles - Andrzej Gorak
2014-07-22

Distillation: Fundamentals and Principles — winner of the 2015 PROSE Award in Chemistry & Physics — is a single source of authoritative information on all aspects of the theory and practice of modern distillation,

suitable for advanced students and professionals working in a laboratory, industrial plants, or a managerial capacity. It addresses the most important and current research on industrial distillation, including all steps in process design (feasibility study, modeling, and experimental validation), together with operation and control aspects. This volume features an extra focus on the conceptual design of distillation. Winner of the 2015 PROSE Award in Chemistry & Physics from the Association of American Publishers Practical information on the newest development written by recognized experts Coverage of a huge range of laboratory and industrial distillation approaches Extensive references for each chapter facilitates further study

Chemical Engineering Volume 2 - J H Harker
2013-10-22

Chemical Engineering Volume 2 covers the properties of particulate systems, including the character of individual particles and their behaviour in

fluids. Sedimentation of particles, both singly and at high concentrations, flow in packed and fluidised beds and filtration are then examined. The latter part of the book deals with separation processes, such as distillation and gas absorption, which illustrate applications of the fundamental principles of mass transfer introduced in Chemical Engineering Volume 1. In conclusion, several techniques of growing importance - adsorption, ion exchange, chromatographic and membrane separations, and process intensification - are described. A logical progression of chemical engineering concepts, volume 2 builds on fundamental principles contained in Chemical Engineering volume 1 and these volumes are fully cross-referenced Reflects the growth in complexity and stature of chemical engineering over the last few years Supported with further reading at the end of each chapter and graded problems at the end of the book

Special Distillation

Processes - Zhigang Lei

2021-08-21

Special Distillation Processes, Second Edition focuses on the latest developments in the field, such as separation methods that may prove useful for solving problems encountered during research. Topics include extraction, membrane and adsorption distillation involving the separation principle, process design and experimental techniques. The relationship between processes and techniques are also presented. Comprehensive and easy-to-read, this book provides key information needed to understand processes. It will be a valuable reference source for chemical engineers and students wishing to branch out in chemical engineering. Provides the only comprehensive book available on special distillation processes. Contains a thorough introduction to recent developments in the field. Presents a valuable reference for students, academics and engineers in chemical

engineering

Dynamics and Control of Chemical Reactors, Distillation Columns and Batch Processes (DYCORD+'92) - J.G. Balchen 2014-05-23

In addition to the three main themes: chemical reactors, distillation columns, and batch processes this volume also addresses some of the new trends in dynamics and control methodology such as model based predictive control, new methods for identification of dynamic models, nonlinear control theory and the application of neural networks to identification and control. Provides a useful reference source of the major advances in the field.

Distillation and Absorption 2006 - Eva Sørensen 2006

This work contains the proceedings of the Distillation and Absorption conference, which happens every 5 years. This collection of 100 contributions spanning 23 countries showcase the newest and best distillation and absorption technologies which cover a broad range of

fundamental and applied aspects of the technology. To address these aspects, the contributions have been put into seven themes: modelling and simulation (steady-state, dynamic and CFD); energy efficiency and sustainability; equipment design and operation; integrated, hybrid and novel processes; process troubleshooting and handling operational problems; control and operation; and basic data. Process Engineering and Design Using Visual Basic - Arun Datta 2013-09-20

Software tools are a great aid to process engineers, but too much dependence on such tools can often lead to inappropriate and suboptimal designs. Reliance on software is also a hindrance without a firm understanding of the principles underlying its operation, since users are still responsible for devising the design. In Process Engineering and Design Encyclopedia of Chemical Processing - Sunggyu Lee 2006

Supplying nearly 350 expertly-written articles on technologies

that can maximize and enhance the research and production phases of current and emerging chemical manufacturing practices and techniques, this second edition provides gold standard articles on the methods, practices, products, and standards recently influencing the chemical industries. New material includes: design of key unit operations involved with chemical processes; design, unit operation, and integration of reactors and separation systems; process system peripherals such as pumps, valves, and controllers; analytical techniques and equipment; current industry practices; and pilot plant design and scale-up criteria.

Instrument Engineers' Handbook, (Volume 2) Third Edition - Bela G. Liptak 1995-05-15

This third edition of the Instrument Engineers' Handbook-most complete and respected work on process instrumentation and control-helps you:

Advances in Distillation

Retrofit - Nguyen Van Duc
Long 2017-09-18

This book describes the current state of the art in the retrofit of existing distillation processes using advanced distillation techniques. Highlighting concept and practical application rather than theory, it emphasizes the use of advanced process integration and intensification techniques, such as multi-effect distillation, heat pump assisted distillation, thermally coupled distillation, dividing wall column, reactive distillation, and innovative hybrid systems. As a thermal separation method, distillation is one of the most important and widely used technologies in the chemical process industry. While it has many advantages, one major drawback is its large energy requirement, which can significantly influence overall plant profitability. The increasing cost of energy has forced industry to reduce its energy requirement, but simultaneously there has been a need to increase capacity and output due to heightened demand. To accomplish this,

the retrofit of distillation processes to increase efficiency and output has become a crucial issue. This book describes the use of advanced process integration and process intensification techniques to carry out effective distillation retrofit. Written by leading researchers in distillation process, process integration, process intensification, and process retrofit, the book presents a comprehensive review of contemporary advanced distillation techniques which can be employed in grass-root systems and retrofit. It is a valuable source of information for undergraduate and postgraduate students of chemical engineering, practicing process designers and chemical engineers.

Distillation Tray Fundamentals -
M. J. Lockett 2009-07-16

First published in 1986, this book contains an in-depth treatment on distillation tray hydrodynamics and efficiency, with an emphasis on sieve and valve trays. As distillation lies at the heart of the petroleum

and chemical industries, so at the heart of most distillation columns are the trays used to effect the separation. Topics covered by the author include froth, foam and spray, dispersion height, pressure drop, flooding and weeping. Procedures for predicting tray efficiency are outlined including the effects of entrainment, weeping and flow maldistribution. Methods for multicomponent efficiency are also covered with examples. Although distillation tray hydrodynamics is probably one of the most well-researched areas of chemical engineering, few books cover the subject other than on an elementary level. The present volume will be used by graduate students and research workers in chemical engineering, and by chemical and process engineers in industry concerned with distillation and absorption.

Distillation Control & Optimization: Operation Fundamentals through Software Control - Alessandro Brambilla
2014-04-10
The latest methodologies for

the control of distillation processes Written by an expert with more than 30 years of industry experience, Distillation Control and Optimization: Operation Fundamentals through Software Control is filled with proven solutions to control problems in distillation processes. This authoritative guide discusses regulatory control and the development of advanced control systems such as multivariable predictive control. Realworld examples of commercial units analyzed using the results of rigorous simulation models are included. Detailed diagrams illustrate the proven methods presented in this practical resource.

COVERAGE INCLUDES: Two-product columns Multiproduct columns Liquid and vapor sidestream columns Column operating pressure Column capacity and efficiency Two-product column basic control Two-product column quality control Disturbances to the column Multiproduct column control Crude oil fractionators control Multivariable predictive control technology Inferenceals

in distillation Quality estimators
of refinery distillation products

Fundamentals of Chemical
Engineering Thermodynamics -

Kevin D. Dahm 2014-01-01

A brand new book,

FUNDAMENTALS OF CHEMICAL
ENGINEERING

THERMODYNAMICS makes the
abstract subject of chemical
engineering thermodynamics
more accessible to
undergraduate students. The
subject is presented through a
problem-solving inductive (from
specific to general) learning
approach, written in a
conversational and
approachable manner. Suitable
for either a one-semester
course or two-semester
sequence in the subject, this
book covers thermodynamics in
a complete and mathematically
rigorous manner, with an
emphasis on solving practical
engineering problems. The
approach taken stresses
problem-solving, and draws
from best practice engineering
teaching strategies.

FUNDAMENTALS OF CHEMICAL
ENGINEERING

THERMODYNAMICS uses

examples to frame the
importance of the material.

Each topic begins with a
motivational example that is
investigated in context to that
topic. This framing of the
material is helpful to all
readers, particularly to global
learners who require big picture
insights, and hands-on learners
who struggle with abstractions.
Each worked example is fully
annotated with sketches and
comments on the thought
process behind the solved
problems. Common errors are
presented and explained.

Extensive margin notes add to
the book accessibility as well as
presenting opportunities for
investigation. Important Notice:
Media content referenced
within the product description
or the product text may not be
available in the ebook version.

**Fundamentals of
Multicomponent Distillation**

- Charles Donald Holland 1981

Distillation Troubleshooting

- Henry Z. Kister 2011-11-30

THE FIRST BOOK OF ITS KIND
ON DISTILLATION TECHNOLOGY

The last half-century of

research on distillation has tremendously improved our understanding and design of industrial distillation equipment and systems. High-speed computers have taken over the design, control, and operation of towers. Invention and innovation in tower internals have greatly enhanced tower capacity and efficiency. With all these advances, one would expect the failure rate in distillation towers to be on the decline. In fact, the opposite is the case: the tower failure rate is on the rise and accelerating. Distillation Troubleshooting collects invaluable hands-on experiences acquired in dealing with distillation and absorption malfunctions, making them readily accessible for those engaged in solving today's problems and avoiding tomorrow's. The first book of its kind on the distillation industry, the practical lessons it offers are a must for those seeking the elusive path to trouble-free distillation. Distillation Troubleshooting covers over 1,200 case histories of problems, diagnoses, solutions,

and key lessons. Coverage includes: * Successful and unsuccessful struggles with plugging, fouling, and coking * Histories and prevention of tray, packing, and internals damage * Lessons taught by incidents and accidents during shutdowns, commissioning, and abnormal operation * Troubleshooting distillation simulations to match the real world * Making packing liquid distributors work * Plant bottlenecks from intermediate draws, chimney trays, and feed points * Histories of and key lessons from explosions and fires in distillation towers * Prevention of flaws that impair reboiler and condenser performance * Destabilization of tower control systems and how to correct it * Discoveries from shutdown inspections * Suppression of foam and accumulation incidents A unique resource for improving the foremost industrial separation process, Distillation Troubleshooting transforms decades of hands-on experiences into a handy reference for professionals and

students involved in the operation, design, study, improvement, and management of large-scale distillation.

Profit Maximization Techniques for Operating Chemical Plants - Sandip K. Lahiri 2020-04-30

A systematic approach to profit optimization utilizing strategic solutions and methodologies for the chemical process industry. In the ongoing battle to reduce the cost of production and increase profit margin within the chemical process industry, leaders are searching for new ways to deploy profit optimization strategies. Profit Maximization Techniques For Operating Chemical Plants defines strategic planning and implementation techniques for managers, senior executives, and technical service consultants to help increase profit margins. The book provides in-depth insight and practical tools to help readers find new and unique opportunities to implement profit optimization strategies. From identifying where the

large profit improvement projects are to increasing plant capacity and pushing plant operations towards multiple constraints while maintaining continuous

improvements—there is a plethora of information to help keep plant operations on budget. The book also includes information on:

- Take away methods and techniques for identifying and exploiting potential areas to improve profit within the plant
- Focus on latest Artificial Intelligence based modeling, knowledge discovery and optimization strategies to maximize profit in running plant.
- Describes procedure to develop advance process monitoring and fault diagnosis in running plant
- Thoughts on engineering design , best practices and monitoring to sustain profit improvements
- Step-by-step guides to identifying, building, and deploying improvement applications For leaders and technologists in the industry who want to maximize profit margins, this text provides basic concepts, guidelines, and

step-by-step guides specifically for the chemical plant sector.

Fundamentals of Chemical Engineering

Thermodynamics, SI Edition

- Kevin D. Dahm 2014-02-21

A brand new book,
FUNDAMENTALS OF CHEMICAL
ENGINEERING

THERMODYNAMICS makes the abstract subject of chemical engineering thermodynamics more accessible to undergraduate students. The subject is presented through a problem-solving inductive (from specific to general) learning approach, written in a conversational and approachable manner. Suitable for either a one-semester course or two-semester sequence in the subject, this book covers thermodynamics in a complete and mathematically rigorous manner, with an emphasis on solving practical engineering problems. The approach taken stresses problem-solving, and draws from best practice engineering teaching strategies.

FUNDAMENTALS OF CHEMICAL
ENGINEERING

THERMODYNAMICS uses examples to frame the importance of the material.

Each topic begins with a motivational example that is investigated in context to that topic. This framing of the material is helpful to all readers, particularly to global learners who require big picture insights, and hands-on learners who struggle with abstractions. Each worked example is fully annotated with sketches and comments on the thought process behind the solved problems. Common errors are presented and explained.

Extensive margin notes add to the book accessibility as well as presenting opportunities for investigation. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Physics of Gas-Liquid Flows

- Thomas J. Hanratty

2013-10-31

Presenting tools for understanding the behaviour of gas-liquid flows based on the ways large scale behaviour relates to small scale

interactions, this text is ideal for engineers seeking to enhance the safety and efficiency of natural gas pipelines, water-cooled nuclear reactors, absorbers, distillation columns and gas lift pumps. The review of advanced concepts in fluid mechanics enables both graduate students and practising engineers to tackle the scientific literature and engage in advanced research. It focuses on gas-liquid flow in pipes as a simple system with meaningful experimental data. This unified theory develops design equations for predicting drop size, frictional pressure losses and slug frequency, which can be used to determine flow regimes, the effects of pipe diameter, liquid viscosity and gas density. It describes the effect of wavy boundaries and temporal oscillations on turbulent flows, and explains transition between phases, which is key to understanding the behaviour of gas-liquid flows.

Encyclopedia of Chemical Processing and Design - John J.

McKetta Jr 1997-05-05
Trays versus Packings in Separator Design to Underground Gas Storage
Reactive Distillation Design and Control - William L. Luyben 2009-03-30

After an overview of the fundamentals, limitations, and scope of reactive distillation, this book uses rigorous models for steady-state design and dynamic analysis of different types of reactive distillation columns and quantitatively compares the economics of reactive distillation columns with conventional multi-unit processes. It goes beyond traditional steady-state design that primarily considers the capital investment and energy costs when analyzing the control structure and the dynamic robustness of disturbances, and discusses how to maximize the economic and environmental benefits of reactive distillation technology.

Distillation: Equipment and Processes - Andrzej Gorak
2014-06-24

Distillation: Equipment and Processes—winner of the 2015

PROSE Award in Chemistry & Physics from the Association of American Publishers—is a single source of authoritative information on all aspects of the theory and practice of modern distillation, suitable for advanced students and professionals working in a laboratory, industrial plants, or a managerial capacity. It addresses the most important and current research on industrial distillation, including all steps in process design (feasibility study, modeling, and experimental validation), together with operation and control aspects. This volume features an extra focus on distillation equipment and processes. Winner of the 2015 PROSE Award in Chemistry & Physics from the Association of American Publishers Practical information on the newest development written by recognized experts Coverage of a huge range of laboratory and industrial distillation approaches Extensive references for each chapter facilitates further study High Pressure Process

Technology: Fundamentals and Applications - A. Bertucco
2001-10-15

Clear evidence of increasing demands in the processing industry prompted the editors and authors to publish a new book about High Pressure Process Technology: Fundamentals and Applications. This book presents the latest knowledge regarding the high pressure processing aspects combined with that about the modeling, the design and the operation of safe and reliable high pressure plants and equipment. This treatment and selection of the subjects is stimulating and unique. Consisting of nine chapters, each subdivided into several sections, the book addresses the high pressure aspects, providing well selected correlated information connected with a comprehensive overview together with a large number of references. The main body of the first eight chapters refers to subjects like high pressure in general, the thermodynamics and kinetics of the fluids

involved, the design of high pressure equipment, the modeling and design of reactors, separation and fractionation units, the safety aspects, the control and economics. In the extended last chapter, examples of promising high pressure applications are explained, such as chemical and enzymatic reactions in supercritical solvents, hydrogenation under supercritical conditions, supercritical water oxidation, polymerization with metallocene catalysts, supercritical extraction, fractionation and precipitation, supercritical pharma processing, ultra-high pressure sterilization and supercritical dry-cleaning.

Distillation And Absorption - K E Porter 1992-12-29

Contains the papers presented at a symposium which aimed to address and record changes in distillation and absorption and to discuss new directions.

Topics covered include: column sequencing; equipment; batch distillation; azeotropic and extractive distillation; packed

columns and more.

Dynamics and Control of Chemical Reactors, Distillation Columns and Batch Processes

(DYCORD'95) - J.B. Rawlings
2014-05-23

Three important areas of process dynamics and control: chemical reactors, distillation columns and batch processes are the main topics of discussion and evaluation at the IFAC Symposium on Dynamics and Control of Chemical Reactors, Distillation Columns and Batch Processes (DYCORD '95). This valuable publication was produced from the latest in the series, providing a detailed assessment of developments of key technologies within the field of process dynamics and control.

Chemical Engineering Design - Ray Sinnott 2005-07-01

Chemical Engineering Design is one of the best-known and widely adopted texts available for students of chemical engineering. It deals with the application of chemical engineering principles to the

design of chemical processes and equipment. Revised throughout, the fourth edition covers the latest aspects of process design, operations, safety, loss prevention and equipment selection, among others. Comprehensive and detailed, the book is supported by problems and selected solutions. In addition the book is widely used by professionals as a day-to-day reference. Best selling chemical engineering text Revised to keep pace with the latest chemical industry changes; designed to see students through from undergraduate study to professional practice End of chapter exercises and solutions

Distillation - Jean-Paul Duroudier 2016-07-30

Distillation, part of the Industrial Equipment for Chemical Engineering set, includes thirteen independent volumes that define how to perform the selection and calculation of equipment involved in the thirteen basic operations of process engineering, also offering reliable and simple methods.

Throughout these concise and easy-to-use books, the author uses his vast practical experience and precision knowledge of global research to present an in-depth study of a variety of aspects within the field of chemical engineering, with this volume focusing on the process of distillation. Using both practical and theoretical examples, the author describes the various reactions and steps involved in separating out the components of a mixture to attain predefined levels of purity. By investigating different types of liquids, an array of column sizes, and the plates involved in distillation, readers will gain a wide understanding of the physics of liquids. The book also details the methods needed to understand the machinery used in applied thermodynamics in the hopes of encouraging students and engineers to manually build the programs they need. Chapters are complemented with appendices that provide additional information and associated references. Contains a practical

and theoretical focus on the process of distillation Provides a clear analysis on the topic that includes practice applications in process engineering Uses both practical and theoretical examples to describe the various reactions and steps involved in separating out the components of a mixture to attain predefined levels of purity

Chemical Process

Equipment - James R. Couper
2012-12-06

Chemical Process Equipment is a results-oriented reference for engineers who specify, design, maintain or run chemical and process plants. This book delivers information on the selection, sizing and operation of process equipment in a format that enables quick and accurate decision making on standard process and equipment choices, saving time, improving productivity, and building understanding. Coverage emphasizes common real-world equipment design rather than experimental or esoteric and focuses on maximizing performance.

Legacy reference for chemical and related engineers who work with vendors to design, specify and make final equipment selection decisions Copious examples of successful applications, with supporting schematics and data to illustrate the functioning and performance of equipment Provides equipment rating forms and manufacturers' data, worked examples, valuable shortcut methods, and rules of thumb to demonstrate and support the design process Heavily illustrated with line drawings and schematics to aid understanding, as well as graphs and tables to illustrate performance data

Chemical Engineering Design -
Gavin Towler 2012-01-13

'Bottom line: For a holistic view of chemical engineering design, this book provides as much, if not more, than any other book available on the topic.' Extract from Chemical Engineering Resources review. *Chemical Engineering Design* is a complete course text for students of chemical engineering. Written for the

Senior Design Course, and also suitable for introduction to chemical engineering courses, it covers the basics of unit operations and the latest aspects of process design, equipment selection, plant and operating economics, safety and loss prevention. It is a textbook that students will want to keep through their undergraduate education and on into their professional lives. Industrial Separation Processes
- André B. de Haan 2020-07-06

Separation processes on an industrial scale account for well over half of the capital and operating costs in the chemical industry. Knowledge of these processes is key for every student of chemical or process engineering. This book is ideally suited to university teaching, thanks to its wealth of exercises and solutions. The second edition boasts an even greater number of applied examples and case studies as well as references for further reading.