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Separation Process Engineering Phillip C. Wankat, 2022-10-24 The Definitive Learner Friendly Guide to Chemical Engineering Separations Extensively Updated Including a New Chapter on Melt Crystallization Efficient separation processes are crucial to addressing many societal problems from developing new medicines to improving energy efficiency and reducing emissions Separation Process Engineering Fifth Edition is the most comprehensive accessible guide to modern separation processes and the fundamentals of mass transfer In this completely updated edition Phillip C Wankat teaches each key concept through detailed realistic examples using actual data with up to date simulation practice spreadsheet based exercises and references Wankat thoroughly covers each separation process including flash column and batch distillation exact calculations and shortcut methods for multicomponent distillation staged and packed column design absorption stripping and more His extensive discussions of mass transfer and diffusion enable faculty to teach separations and mass transfer in a single course And detailed material on liquid liquid extraction adsorption chromatography and ion exchange prepares students for advanced work New and updated content includes melt crystallization steam distillation residue curve analysis batch washing the Shanks system for percolation leaching eutectic systems forward osmosis microfiltration and hybrid separations A full chapter discusses economics and energy conservation including updated equipment costs Over 300 new and updated homework problems are presented all extensively tested in undergraduate courses at Purdue University New chapter on melt crystallization solid liquid phase equilibrium suspension static and falling film layer approaches and 34 questions and problems New binary VLE equations and updated content on simultaneous solutions New coverage of safety and fire hazards New material on steam distillation simple multi component batch distillation and residue curve analysis Expanded discussion of tray efficiencies packed column design and energy reduction in distillation New coverage of two hybrid extraction with distillation and the Kremser equation in fractional extraction Added sections on deicing with eutectic systems eutectic freeze concentration and scale up New sections on forward osmosis and microfiltration Expanded advanced content on adsorption and ion exchange including updated instructions for eight detailed Aspen Chromatography labs Discussion of membrane separations including gas permeation reverse osmosis ultrafiltration pervaporation and applications Thirteen up to date Aspen Plus process simulation labs adaptable to any simulator This guide reflects an up to date understanding of how modern students learn designed organized and written to be exceptionally clear and easy to use It presents detailed examples in a clear standard format using real data to solve actual engineering problems preparing students for their future careers

Separation Process Engineering Phillip C. Wankat, 2012 The Definitive Fully Updated Guide to Separation Process Engineering Now with a Thorough Introduction to Mass Transfer Analysis Separation Process Engineering Third Edition is the most comprehensive accessible guide available on modern separation processes and the fundamentals of mass transfer Phillip C Wankat teaches each key concept through detailed realistic examples using real data

including up to date simulation practice and new spreadsheet based exercises Wankat thoroughly covers each of today's leading approaches including flash column and batch distillation exact calculations and shortcut methods for multicomponent distillation staged and packed column design absorption stripping and more In this edition he also presents the latest design methods for liquid liquid extraction This edition contains the most detailed coverage available of membrane separations and of sorption separations adsorption chromatography and ion exchange Updated with new techniques and references throughout Separation Process Engineering Third Edition also contains more than 300 new homework problems each tested in the author's Purdue University classes Coverage includes Modular up to date process simulation examples and homework problems based on Aspen Plus and easily adaptable to any simulator Extensive new coverage of mass transfer and diffusion including both Fickian and Maxwell Stefan approaches Detailed discussions of liquid liquid extraction including McCabe Thiele triangle and computer simulation analyses mixer settler design Karr columns and related mass transfer analyses Thorough introductions to adsorption chromatography and ion exchange designed to prepare students for advanced work in these areas Complete coverage of membrane separations including gas permeation reverse osmosis ultrafiltration pervaporation and key applications A full chapter on economics and energy conservation in distillation Excel spreadsheets offering additional practice with problems in distillation diffusion mass transfer and membrane separation

Separation of Molecules, Macromolecules and Particles Kamallesh Sirkar, 2014-01-16 A modern separation process textbook written for advanced undergraduate and graduate level courses in chemical engineering

Stevioside Sirshendu De, Sourav Mondal, Suvrajit Banerjee, 2013-08-20 Stevioside is one of the naturally occurring sweeteners belonging to the diterpene glycoside family which can be widely applied in food drinks medicine and consumer chemicals It is a good dietary supplement being non calorific thermally stable non toxic with a sugar like taste profile and suitable for diabetics phenylketonuria patients and the obese It is also non fermentable and exhibits anti carcinogenic antioxidant and anti hyperglycemic properties Stevioside tastes about 300 times sweeter than 0.4% sucrose solution Thus it offers a reasonably rare combination of health benefits and taste benefits making the extraction of stevioside is an area of active research for the food industry as well as academic food scientists With the rapid increase in the popularity of stevioside as a sugar substitute particularly with regard to its associated health benefits there is a need for more efficient and feasible extraction processes for stevioside in the near future This book offers an in depth look at perhaps the major sugar alternative of the future up to date and in line with the latest global legislation regarding its suitability for consumption and its scope for application

Thermodynamics with Chemical Engineering Applications Elias I. Franses, 2014-08-25 Master the principles of thermodynamics and understand their practical real world applications with this deep and intuitive undergraduate textbook

Chemical Engineering, 2007

Desalination, 1991

Chemical Process Equipment - Selection and Design (Revised 2nd Edition) James R. Couper, W Roy Penney, James R. Fair PhD, 2009-08-11 A facility is only as efficient and profitable as the

equipment that is in it this highly influential book is a powerful resource for chemical process or plant engineers who need to select design or configures plant successfully and profitably It includes updated information on design methods for all standard equipment with an emphasis on real world process design and performance The comprehensive and influential guide to the selection and design of a wide range of chemical process equipment used by engineers globally Copious examples of successful applications with supporting schematics and data to illustrate the functioning and performance of equipment Revised edition new material includes updated equipment cost data liquid solid and solid systems and the latest information on membrane separation technology Provides equipment rating forms and manufacturers data worked examples valuable shortcut methods rules of thumb and equipment rating forms to demonstrate and support the design process Heavily illustrated with many line drawings and schematics to aid understanding graphs and tables to illustrate performance data The Science of Tequila Anne Gschaedler Mathis, Melchor Arellano Plaza, Manuel Kirchmayr, Enrique J.

Herrera-López, 2025-06-27 The Science of Tequila is the first English language book published on Tequila production The book contextualizes tequila with historical social and cultural information covering the cultivation of the Agave tequilana plant the stages of the tequila production process and the characterization of the final product Finally the management of tequila by products are covered including their sustainable uses and potential as biofuels This book will be of interest to beverage scientists interested in the distillation and fermentation of alcoholic beverages plant scientists interested in the agave plant and engineers in the alcoholic beverages biorefinery vinasses and waste treatment industries R D departments at beverage companies interested in producing tequila or mezcal will also benefit from this reference Presents the latest advances in research and technology developed around tequila production processes Covers tequila s raw material Agave tequilana and describes common problems and solutions in its cultivation Details processes of treatment and the use of tequila by products for sustainable production Outlines the historic economic and legal context of tequila production

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

Fundamental Concepts and Computations in Chemical Engineering
Vivek Utgikar, 2016-10-25 The Breakthrough Introduction to Chemical Engineering for Today's Students Fundamental Concepts and Computations in Chemical Engineering is well designed for today's chemical engineering students offering lucid and logically arranged text that brings together the fundamental knowledge students need to gain confidence and to jumpstart future success Dr Vivek Utgikar illuminates the day to day roles of chemical engineers in their companies and in the global economy He clearly explains what students need to learn and why they need to learn it and presents practical computational exercises that prepare beginning students for more advanced study Utgikar combines straightforward discussions of essential topics with challenging topics to intrigue more well prepared students Drawing on extensive experience teaching beginners he introduces each new topic in simple relatable language and supports them with meaningful example calculations in Microsoft Excel and Mathcad Throughout Utgikar presents practical methods for effective problem solving and explains how to set up and use computation tools to get accurate answers Designed specifically for students entering chemical engineering programs this text also serves as a handy quick reference to the basics for more advanced students and an up to date source of valuable information for educators and professionals Coverage includes Where chemical engineering fits in the engineering field and overall economy Modern chemical engineering and allied industries and their largest firms How typical chemical engineering job functions build on what undergraduates learn The importance of computations and the use of modern computational tools How to classify problems based on their mathematical nature Fundamental fluid flow phenomena and computational problems in practical systems Basic principles and computations of material and energy balance Fundamental principles and calculations of thermodynamics and kinetics in chemical engineering How chemical engineering systems and problems integrate and interrelate in the real world Review of commercial process simulation software for complex large scale computation

Chemical Engineering Education, 2003
Proceedings of the Second Engineering Foundation Conference on Fundamentals of Adsorption Athanasios I. Liapis, 1987
Process and Chemical Engineering, 2000 **Theoretical Chemical Engineering Abstracts**, 1984 Separation Process Engineering, 2014 *Industrial & Engineering Chemistry Process Design and Development*, 1985
Bioseparations Engineering Michael R. Ladisch, 2001-03-27 Bioseparations engineering is the multidisciplinary application of fundamental engineering and biological principles to the design of absorbents systems and processes for the

separation of biological molecules **International Chemical Engineering** ,1982
New York Public Library. Research Libraries,1978

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