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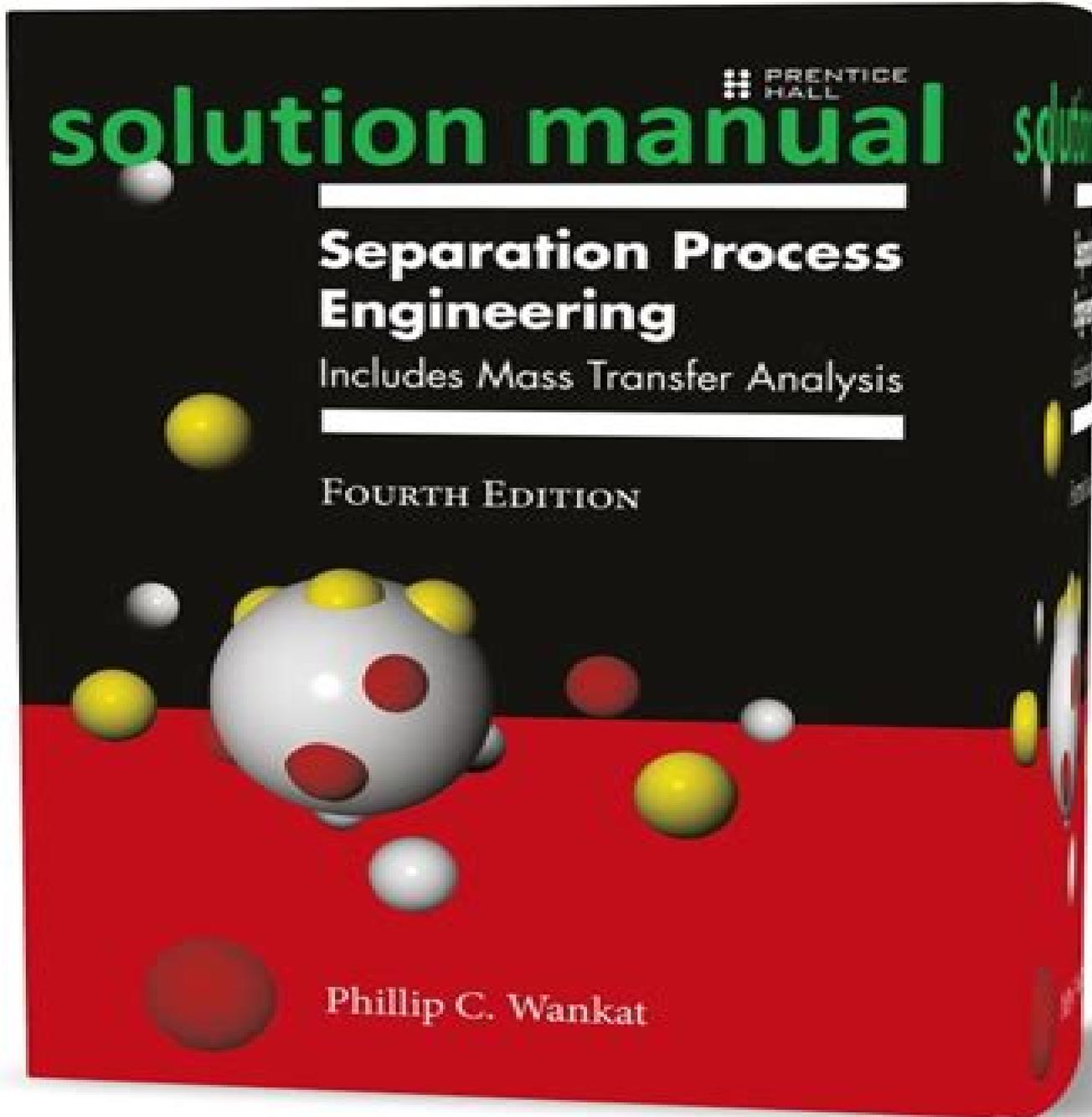
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Separation Process Engineering

Includes Mass Transfer Analysis

FOURTH EDITION

Phillip C. Wankat



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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 [Industrial Separation Processes](#) André B. de Haan, H. Burak Eral, Boelo Schuur, 2025-05-06 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 and makes this book with its wealth of exercises and solutions ideally suited to university teaching The Third edition boasts an even

greater number of applied examples and updated chapters on drying adsorption and membranes *Solutions Manual to Accompany Separation Processes* Cary Judson King,1980 **Solutions Manual: Introduction to Analysis and Design of Equilibrium Staged Separation Processes** Rajinder Pal,2020-03-31 This Solutions Manual gives complete solutions of all the practice problems given at the end of each chapter total of 16 chapters of the text INTRODUCTION TO ANALYSIS AND DESIGN OF EQUILIBRIUM STAGED SEPARATION PROCESSES For the convenience of the readers the practice problems given in the text have been restated before providing the solution Information Sources in Engineering Roderick A. Macleod,Jim Corlett,2012-04-17 The current thoroughly revised and updated edition of this approved title evaluates information sources in the field of technology It provides the reader not only with information of primary and secondary sources but also analyses the details of information from all the important technical fields including environmental technology biotechnology aviation and defence nanotechnology industrial design material science security and health care in the workplace as well as aspects of the fields of chemistry electro technology and mechanical engineering The sources of information presented also contain publications available in printed and electronic form such as books journals electronic magazines technical reports dissertations scientific reports articles from conferences meetings and symposiums patents and patent information technical standards products electronic full text services abstract and indexing services bibliographies reviews internet sources reference works and publications of professional associations Information Sources in Engineering is aimed at librarians and information scientists in technical fields as well as non professional information specialists who have to provide information about technical issues Furthermore this title is of great value to students and people with technical professions Sustainable Process Engineering Gyorgy Szekely,2024-07-01 Sustainable process engineering is a methodology to design new and redesign existing processes that follow the principles of green chemistry and green engineering and ultimately contribute to a sustainable development The newest achievements of chemical engineering opened new opportunities to design more efficient safe compact and environmentally benign chemical processes The book provides a guide to sustainable process design applicable in various industrial fields Discusses the topic from a wide angle chemistry materials processes and equipment Includes state of the art research achievements that are yet to be industrially implemented Transfers knowledge between chemists and chemical engineers QR codes direct the readers to animations short videos magazines and blogs on specific topics Worked examples deepen the understanding of the sustainable assessment of chemical manufacturing processes The Publishers' Trade List Annual ,1981 **Chemical Engineering Education** ,1993 *Engineering Education* ,1982 *Solutions manual to accompany separation processes* Cary Judson King,1974 Process Engineering ,1993 Process Science and Engineering for Water and Wastewater Treatment Simon Judd,Thomas Stephenson,2002-03-01 Process Science and Engineering for Water and Wastewater Treatment is the first in a new series of distance learning course books from IWA Publishing The new series intends to help readers become familiar

with design operation and management of water and wastewater treatment processes without having to refer to any other texts Process engineering is considered fundamental to successful water and wastewater treatment and Process Science and Engineering for Water and Wastewater Treatment provides the fundamental chemistry biology and engineering knowledge needed to learn and understand the underlying scientific principles directly relevant to water and wastewater treatment processes Units in the text covering chemistry and biology include fundamentals of water chemistry chemical kinetics and equilibria colloid and surface chemistry fundamentals of microbiology fundamentals biochemistry and microbial kinetics The concept of Process Engineering is introduced through units on mass and heat balances mass and heat transfer reactor design theory engineering hydraulics and particle settlement The text is designed for individual study at the learner s own pace Each section contains multiple features to aid learning including boxes highlighting key learning points exercises and problems with fully worked solutions to help the reader test their understanding as they progress through the text a comprehensive set of self assessment questions with answers at the end of each unit Designed as a starting point for the other books in the Water and Wastewater Process Technologies Series this book also provides a self contained course of learning in the science and engineering for water and wastewater treatment processes It forms part of the Masters degree programme taught in the School of Water Sciences at Cranfield University UK

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Thermodynamics Joseph Mauk Smith,Hendrick C. Van Ness,1987 *Introduction to Chemical Engineering Thermodynamics* 6 e presents comprehensive coverage of the subject of thermodynamics from a chemical engineering viewpoint The text provides a thorough exposition of the principles of thermodynamics and details their application to chemical processes The chapters are written in a clear logically organized manner and contain an abundance of realistic problems examples and illustrations to help students understand complex concepts New ideas terms and symbols constantly challenge the readers to think and encourage them to apply this fundamental body of knowledge to the solution of practical problems The comprehensive nature of this book makes it a useful reference both in graduate courses and for professional practice The sixth edition continues to be an excellent tool for teaching the subject of chemical engineering thermodynamics to undergraduate students

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