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Separation Process Engineering

Springer

A compilation of the calculation procedures needed every day on the job by chemical engineers. Tables of Contents: Physical and Chemical Properties; Stoichiometry; Phase Equilibrium; Chemical-Reaction Equilibrium; Reaction Kinetics and Reactor Design; Flow of Fluids and Solids; Heat Transfer; Distillation;

Extraction and Leaching; Crystallization; Filtration; Liquid Agitation; Size Reduction; Drying; Evaporation; Environmental Engineering in the Plant. Illustrations. Index.

Harmonization of Leaching/Extraction Tests Elsevier

This is a unique compilation on the use of leaching/extraction methods in different fields. The use of leaching test methods is increasing in various areas including: waste treatment and disposal; incineration of waste; soil clean-up and reuse of cleaned soil; sludge treatment. This has led to (and may increasingly

lead to) the development of a large number of very similar tests in these different fields. However, these developments are taking place with no clear understanding of their mutual relationships. In view of these developments, efforts are needed to harmonize the leaching procedures that could be adapted for different matrices, as well as validate the use of existing tests in other fields. The development of a wide variety of leaching/extraction tests for different matrices is undesirable from a regulatory point of view and undesirable for industry. Clarity in testing is crucial in producer-consumer relations. This collective document will assist in improving the understanding of leaching from a variety of sources and will, where appropriate, help to bring

together the approaches used in different technical fields and in different countries.

Chemical Engineering Design Kaplan
AEC Engineering

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

Chemical Engineering John Wiley & Sons

This book is based on the undergraduate and MSc courses in hydrometallurgy which Professor A R Burkin gave from 1961 until he retired in 1988. It is divided into two sections. The first deals with the fundamental chemical and physical principles on which the technology is based. In the second, processes which are used for the production of individual metals are described, in terms of those principles where appropriate.

The Chemical Trade Journal and Chemical Engineer Royal Society of Chemistry

The introductory chapter reviews the test specifications and the author's

recommendation on the best strategy for passing the exam. The first chapter reviews English and SI units and conversions. A complete conversion table is given. Chapter 3 covers heat transfer, conduction, transfer coefficients and heat transfer equipment. Chapter 4 covers evaporation principles, calculations and example problems. Distillation is thoroughly covered in chapter 5. The subsequent chapters review fundamentals of fluid mechanics, hydraulics and typical pump and piping problems: absorption, leaching, liquid-liquid extraction, and the rest of the exam topics. Each of the topics is reviewed followed by examples of examination problems. This book is the ideal study guide bringing all elements of professional problem solving together

in one Big Book. The first truly practical, no-nonsense review for the difficult PE exam. Full Step-by-Step solutions included.

Methods to Study Litter Decomposition

McGraw-Hill Professional Publishing

This broad-based book covers the three major areas of Chemical Engineering. Most of the books in the market involve one of the individual areas, namely, Fluid Mechanics, Heat Transfer or Mass Transfer, rather than all the three. This book presents this material in a single source. This avoids the user having to refer to a number of books to obtain information. Most published books covering all the three areas in a single source emphasize theory rather than practical issues. This book is written with emphasis on practice with brief

theoretical concepts in the form of questions and answers, not adopting stereo-typed question-answer approach practiced in certain books in the market, bridging the two areas of theory and practice with respect to the core areas of chemical engineering. Most parts of the book are easily understandable by those who are not experts in the field. Fluid Mechanics chapters include basics on non-Newtonian systems which, for instance find importance in polymer and food processing, flow through piping, flow measurement, pumps, mixing technology and fluidization and two phase flow. For example it covers types of pumps and valves, membranes and areas of their use, different equipment commonly used in chemical industry and their merits and drawbacks. Heat

Transfer chapters cover the basics involved in conduction, convection and radiation, with emphasis on insulation, heat exchangers, evaporators, condensers, reboilers and fired heaters. Design methods, performance, operational issues and maintenance problems are highlighted. Topics such as heat pipes, heat pumps, heat tracing, steam traps, refrigeration, cooling of electronic devices, NO_x control find place in the book. Mass transfer chapters cover basics such as diffusion, theories, analogies, mass transfer coefficients and mass transfer with chemical reaction, equipment such as tray and packed columns, column internals including structural packings, design, operational and installation issues, drums and separators are discussed in good detail.

Absorption, distillation, extraction and leaching with applications and design methods, including emerging practices involving Divided Wall and Petluk column arrangements, multicomponent separations, supercritical solvent extraction find place in the book.

The Chemical Engineer Elsevier

This new dictionary provides a quick and authoritative point of reference for chemical engineering, covering areas such as materials, energy balances, reactions, and separations. It also includes relevant terms from the areas of chemistry, physics, mathematics, and biology.

Chemical Hydrometallurgy John Wiley & Sons

Textbook on chemical industry engineering - covers theoretics,

definitions, technical aspects, etc.

Fluid Mechanics, Heat Transfer, and Mass Transfer World Scientific

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

Handbook of Chemical Engineering

Springer Science & Business Media
Surveys the selection, design, and operation of most of the industrially important separation processes.

Discusses the underlying principles on which the processes are based, and provides illustrative examples of the use of the processes in a modern context. Features thorough treatment of newer separation processes based on membranes, adsorption, chromatography, ion exchange, and chemical complexation. Includes a review of historically important

separation processes such as distillation, absorption, extraction, leaching, and crystallization and considers these techniques in light of recent developments affecting them.

Chemical Engineers' Handbook Oxford University Press

Rare Metal Extraction by Chemical Engineering Techniques describes the use of chemical engineering techniques in the extraction and purification of rare metals such as uranium, thorium, and zirconium as well as hafnium, titanium, beryllium, and vanadium. The various chemical extraction stages from ore to metal are discussed. Comprised of nine chapters, this book begins with an examination of ore breakdown processes including dilute acid leaching and the breakdown of concentrated acids,

alkalis, and fluorides as well as chlorination. The reader is then introduced to ion-exchange purification; solvent extraction; and dryway conversion processes. Subsequent chapters focus on metal production by high-temperature reduction techniques; molten salt electrolytic processes; and iodide decomposition processes. The final chapter includes a selection of complete flowsheets for the extraction and purification rare metals from ores. This monograph will be of value to metallurgists, chemical engineers, chemists, and others who are interested in the extraction of rare metals.

Chemical Engineer Elsevier

The primary objective of this book is to provide students and laboratory instructors at universities and

professional ecologists with a broad range of established methods to study plant litter decomposition. Detailed protocols for direct use in the field or laboratory are presented in an easy to follow step-by-step format. A short introduction to each protocol reviews the ecological significance and principles of the technique and points to key references.

Experimental Caustic Leaching of Oxidized Zinc Ores and Minerals and the Recovery of Zinc from Leach Solutions
Prentice Hall

Mechanochemistry as a branch of solid state chemistry enquires into processes which proceed in solids due to the application of mechanical energy. This provides a thorough, up to date overview of mechanochemistry of solids and

minerals. Applications of mechanochemistry in nanoscience with special impact on nanogeoscience are described. Selected advanced identification methods, most frequently applied in nanoscience, are described as well as the advantage of mechanochemical approach in minerals engineering. Examples of industrial applications are given. Mechanochemical technology is being applied in many industrial fields: powder metallurgy (synthesis of nanometals, alloys and nanocompounds), building industry (activation of cements), chemical industry (solid waste treatment, catalyst synthesis, coal ashes utilization), minerals engineering (ore enrichment, enhancement of processes of extractive metallurgy), agriculture industry

(solubility increase of fertilizers), and pharmaceutical industry (improvement of solubility and bioavailability of drugs). This reference serves as an introduction to newcomers to mechanochemistry, and encourages more experienced researchers to broaden their knowledge and discover novel applications in the field.

Coulson and Richardson's Chemical Engineering Elsevier

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

Chemical Engineering and Mining Review
John Wiley & Sons

First published in 1998. This book offers a wealth of information on the rapidly expanding field of solution mining: the extraction of materials from the earth by leaching and fluid recovery. This is an introductory text for students and professional engineers that is comprehensive and emphasizes current practice and theory. Percolation leaching of fragmented ground is covered, as well as true and modified in situ teaching. Solution mining of gold, copper and uranium ores, several slats extracted from evaporates and brines, and sulfur are discussed. Mineral teaching chemistry and kinetics, hydrology (including flow equations for various wellfields and other fluid recovery

systems), environmental containment and solution mining simulation models are also included.

Fossil Energy Update Routledge
Coulson and Richardson's Chemical Engineering: Volume 2B, Separation Processes, Sixth Edition, covers distillation and gas absorption, illustrating applications of the fundamental principles of mass transfer. Several techniques, including adsorption, ion exchange, chromatographic membrane separations and process intensification are comprehensively covered and explored. Presents content converted from textbooks into fully revised reference material Provides content that ranges from foundational to technical Includes new additions, such as emerging applications, numerical

methods, and computational tools
Chemical Engineering Springer Science
 & Business Media

This book covers various metallurgical topics, viz. roasting of sulfide minerals, matte smelting, slag, reduction of oxides and reduction smelting, interfacial phenomena, steelmaking, secondary steelmaking, role of halides in extraction of metals, refining, hydrometallurgy and electrometallurgy. Each chapter is illustrated with appropriate examples of applications of the technique in extraction of some common, reactive, rare or refractory metal together with worked out problems explaining the principle of the operation.

Chemical Engineering Catalog John
 Wiley & Sons

This book is a definitive reference on the

environmental geochemistry and
 resource potential of metallurgical slags

**A Dictionary of Chemical
 Engineering** Elsevier

ELECTRONIC WASTE MANAGEMENT

Current knowledge on electronic waste management strategies, along with future challenges and solutions, supported by case studies Electronic Waste Management maps out numerous aspects of health and environmental impacts associated with electronic waste, thoroughly detailing what we can expect in terms of the use of electronic products and the management of electronic waste in the future. The book assists readers in grasping the fundamentals of the entire e-waste system by covering various factors related to the health and environmental

impacts of electronic waste, as well as a perspective on the subject based on current global recycling strategies. Presented in a straightforward and scientific manner, the book also covers many electronic waste management process technologies. By inviting together, a diverse group of experts, including researchers, policymakers, and industry professionals who generously shared their knowledge and experiences in the field to tackling this global issue, *Electronic Waste Management* enables readers to foster a deeper understanding of the complex issues surrounding electronic waste and to explore innovative solutions that can help mitigate its adverse effects on the environment and health of human and animals. Sample topics covered in

Electronic Waste Management include: Global electronic waste management strategies and different global waste models, including their social, ecological, and economical aspects Economic impacts of e-waste, including cleanup costs and global loss of valuable resources like metals and plastics Value creation from electronic waste (closing the loop) and future prospects in sustainable development Negative impacts of e-waste, including environmental pollution and human health risks, such as when harmful chemicals leach into water sources *Electronic Waste Management* serves as a highly valuable resource for anyone involved in the global e-waste arena, including producers, users, recyclers, policymakers, academics, researchers,

and health workers, by increasing knowledge and awareness surrounding health and environmental impacts that electronic waste poses.

Library of Congress Subject Headings

McGraw Hill Professional

This is a review book for people planning to take the PE exam in Chemical Engineering. Prepared specifically for the exam used in all 50 states. It features 188 new PE problems with detailed step by step solutions. The book covers all topics on the exam, and includes easy to use tables, charts, and formulas. It is an ideal desk companion to DAS's Chemical Engineer License Review. It includes sixteen chapters and a short PE sample exam as well as complete references

and an index. Chapters include the following topical areas: * Material and energy balances * Fluid dynamics * Heat transfer * Evaporation * Distillation * Absorption * Leaching * Liq-liq extraction * Psychrometry and humidification * Drying * Filtration * Thermodynamics * Chemical kinetics * Process control * Mass transfer * Plant safety The ideal study guide, this book brings all elements of professional problem solving together in one BIG BOOK. It is also an ideal desk reference, and it answers hundreds of the most frequently asked questions. It is the first truly practical, no-nonsense problem and solution book for the difficult PE exam. Full step-by-step solutions are additionally included.

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