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Beyond the Fundamentals McGraw-Hill Companies

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, NOx 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.

Unit Processes in Organic Synthesis Sre Shreves Chemical Process Industries Handbook, 5/E

Chemistry and chemical engineering have changed significantly in the last decade. They have broadened their scope into biology, nanotechnology, materials science, computation, and advanced methods of process systems engineering and control so much that the programs in most chemistry and chemical engineering departments now barely resemble the classical notion of chemistry. Beyond the Molecular Frontier brings together research, discovery, and invention across the entire spectrum of the chemical sciences from fundamental, molecular-level chemistry to large-scale chemical processing technology. This reflects the way the field has evolved, the synergy at universities between research and education in chemistry and chemical engineering, and the way chemists and chemical engineers work together in industry. The astonishing developments in science and engineering during the 20th century have made it possible to dream of new goals that might previously have been considered unthinkable. This book identifies the key opportunities and challenges for the chemical sciences, from basic research to societal needs and from terrorism defense to environmental protection, and it looks at the ways in which chemists and chemical engineers can work together to contribute to an improved future.

Survey of Industrial Chemistry Echo Point Books & Media

As business processes are crucial success factors

for companies, software-based Business Process Management (BPM) is becoming more and more important. In this area SAP, the market leader for enterprise application software, has already gathered substantial experience. For the characterization, modeling and especially the optimization of business processes, SAP's consultants use their own BPM approach. In addition to their considerable methodological know-how, the consultants' profound knowledge of the industries facilitates the focus on core and business-critical processes. This book examines the current market situation, as well as the specific challenges and trends for the chemical and pharmaceutical industries. It also explains business process management basics and the specific SAP Consulting methodology, before illustrating the use of such methods and procedures with sample industry-specific core business processes. With the help of these examples from the chemical and pharmaceutical industries, SAP Consulting provides methodological guidelines on how Business Process Management can be used in practice to optimize business processes and make adjustments in response to constantly changing economic and environmental factors.

Sulphonation Technology in the Detergent Industry PHI Learning Pvt. Ltd. Survey of Industrial Chemistry arose from a need for a basic text dealing with industrial chemistry for use in a one semester, three-credit senior level course taught at the University of Wisconsin-Eau Claire. This edition covers all important areas of the chemical industry, yet it is reasonable that it can be covered in 40 hours of lecture. Also an excellent resource and reference for persons working in the chemical and related industries, it has sections on all important technologies used by these industries: a one-step source to answer most questions on practical, applied chemistry. Young scientists and engineers

just entering the workforce will find it especially useful as a readily available handbook to prepare them for a type of chemistry quite different than they have seen in their traditional coursework, whether graduate or undergraduate.

Intro To Chem Engg Royal Society of Chemistry

Filling a longstanding gap for graduate courses in the field, *Chemical Reaction Engineering: Beyond the Fundamentals* covers basic concepts as well as complexities of chemical reaction engineering, including novel techniques for process intensification. The book is divided into three parts: *Fundamentals Revisited*, *Building on Fundamentals*, and *Beyond the Fundamentals*. Part I: *Fundamentals Revisited* reviews the salient features of an undergraduate course, introducing concepts essential to reactor design, such as mixing, unsteady-state operations, multiple steady states, and complex reactions. Part II: *Building on Fundamentals* is devoted to "skill building," particularly in the area of catalysis and catalytic reactions. It covers chemical thermodynamics, emphasizing the thermodynamics of adsorption and complex reactions; the fundamentals of chemical kinetics, with special emphasis on microkinetic analysis; and heat and mass transfer effects in catalysis, including transport between phases, transfer across interfaces, and effects of external heat and mass transfer. It also contains a chapter that provides readers with tools for making accurate kinetic measurements and analyzing the data obtained. Part III: *Beyond the Fundamentals* presents material not commonly covered in textbooks, addressing aspects of reactors involving more than one phase. It discusses solid catalyzed fluid-phase reactions in fixed-bed and fluidized-bed reactors, gas–solid noncatalytic reactions, reactions involving at least one liquid phase (gas–liquid and liquid–liquid), and multiphase reactions. This section also describes membrane-assisted reactor engineering, combo reactors, homogeneous catalysis, and phase-transfer catalysis. The final chapter provides a perspective on future trends in reaction engineering.

Elsevier

Biochemical Engineering Fundamentals, 2/e, combines contemporary engineering science with relevant biological concepts in a comprehensive introduction to biochemical engineering. The biological background provided enables students to comprehend the major problems in biochemical engineering and formulate effective solutions.

Elementary Principles of Chemical Processes Springer Science &

Business Media

Rubber linings can be used as passive protection against the corrosion of plant and equipment in the chemical process industries. Rubbers act as sacrificial materials reacting or un-reacting with the corrosive media, diffusing the liquids or not diffusing, swelling by itself or not swelling, permeating or not permeating gases or fumes, abrading or wearing by the slurry particles, getting ozonised or oxidised; but still protecting the metal surface beneath it, during its considerable life cycle under those severe and stressed conditions. Rubbers age but their life cycle is good enough to protect the metals against corrosion and erosion. The raw material bases are natural or synthetic rubbers. Rubber is used for corrosion/abrasion proof linings, more than any other material because of its proven superiority in this service at a relatively low cost. Fertilizer, electroplating, ore-refining, petrochemicals, chlor-alkali and paper industries invariably turn to rubber linings, in preference to other types of linings for their high resistance to corrosion and abrasion. Moreover the variety of rubbers, both natural and man-made, available and its flexibility to serve under wide temperature and pressure ranges, made rubber linings as the world-wide accepted anti-corrosive and anti-abrasive media. This book describes exactly how to use rubber as a lining in tanks and how to overcome problems associated with this technique.

Chemical Calculations of Manufacturing Processes McGraw-Hill Science, Engineering & Mathematics

"The most complete, up-to-date, problem-solving toolkit for chemical engineers and process designers. *Industrial Chemical Process Design, Second Edition* provides a step-by-step methodology and 25 downloadable, customizable, needs-specific software applications that offer quick, accurate solutions to complex process design problems. These applications uniquely fill the gaps left by large, very expensive commercial process simulation software packages used to select, size, and design industrial chemical process equipment. Written by a hands-on industry consultant and featuring more than 200 illustrations, this book thoroughly details: Sizing and cost estimating of process unit operation equipment Design and rating of fractionation equipment and three-phase separation equipment Chemical optimization Commercial distillation Packaged plant cost analysis Estimating cost for modular packages Performing operations such as liquid-liquid extraction and gas liquid separation vessel sizing and rating Green engineering New to the Second Edition: Added focus on sustainability with new green engineering coverage: crude oil database; vegetable oils and plant greenhouse production for use in automobile fuels; gasoline and diesel fuel database; greenhouse fuels; water removal treatment in three-phase

vessel design New focus on engineering economics Simplified shell/tube design method and improved shell/tube exchanger software improvements Fluid flow coverage includes both single- and two-phase flow and the very desirable addition of complete process engineering of NOx removal and catalytic SCR reactor processes necessary in all electric generator power plants and refinery furnace systems (per mandatory EPA regulations) Coverage of the Fischer-Tropsch process converting natural methane gas to crude oil products, liquids, gasoline, diesel, and jet fuel - all sulfur-free! Includes a plan to decrease reliance on crude oil imports Contains a packaged cost analysis natural gas-to-liquids plant turn-key software program "--
Chemical Processing Handbook CRC Press

Basic Of Control System Hardwares.# Static And Dynamic Behaviors Of Instruments And Processes.# Controlling Devices And Control Strategies.# Automatic Control Of Process Plants.# Analysis Of Stable Control Systems.# Computer Controlled System Analysis# Simulators In Control Systems.# Study Of Control Systems In A Computer Screen.# Model Questions And Answers From Gate Examinations. Content Highlights : - Preface # Introduction To The Beginners # Measurement And Control Hardware Strategies # Static And Dynamic Characteristics # Control Devices # Various Control Strategies # Examples Of Process Control In Chemical Plants # Control System Design # Mathematical Analysis Of Computer Control System In Practice Disk # Gate Exercises # Index.
Principles, Practice and Economics of Plant and Process Design John Wiley & Sons

This volume in the Coulson and Richardson series in chemical engineering contains full worked solutions to the problems posed in volume 1. Whilst the main volume contains illustrative worked examples throughout the text, this book contains answers to the more challenging questions posed at the end of each chapter of the main text. These questions are of both a standard and non-standard nature, and so will prove to be of interest to both academic staff teaching courses in this area and to the keen student. Chemical engineers in industry who are looking for a standard solution to a real-life problem will also find the book of considerable interest. * An invaluable source of information for the student studying the material contained in *Chemical Engineering Volume 1* * A helpful method of learning - answers are explained in full

Chemical Process Technology CRC Press

Sre Shreves *Chemical Process Industries Handbook, 5/E* McGraw-Hill Education

Chemical Engineering Design Project Springer Science & Business Media

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Chemical Engineering: Solutions to the Problems in Volume 1

McGraw Hill Professional

With a focus on actual industrial processes, e.g. the production of light alkenes, synthesis gas, fine chemicals, polyethylene, it encourages the reader to think “out of the box” and invent and develop novel unit operations and processes. Reflecting today’s emphasis on sustainability, this edition contains new coverage of biomass as an alternative to fossil fuels, and process intensification. The second edition includes: New chapters on Process Intensification and Processes for the Conversion of Biomass Updated and expanded chapters throughout with 35% new material overall Text boxes containing case studies and examples from various different industries, e.g. synthesis loop designs, Sasol I Plant, Kaminsky catalysts, production of Ibuprofen, click chemistry, ammonia synthesis, fluid catalytic cracking Questions throughout to stimulate debate and keep students awake! Richly illustrated chapters with improved figures and flow diagrams Chemical Process Technology, Second Edition is a comprehensive introduction, linking the fundamental theory and concepts to the applied nature of the subject. It will be invaluable to students of chemical engineering,

biotechnology and industrial chemistry, as well as practising chemical engineers. From reviews of the first edition: “The authors have blended process technology, chemistry and thermodynamics in an elegant manner... Overall this is a welcome addition to books on chemical technology.” – The Chemist “Impressively wide-ranging and comprehensive... an excellent textbook for students, with a combination of fundamental knowledge and technology.” –

Chemistry in Britain (now Chemistry World)

Design And Economics Tata McGraw-Hill Education

A practical, concise guide to chemical engineering principles and applications Chemical Engineering: The Essential Reference is the condensed but authoritative chemical engineering reference, boiled down to principles and hands-on skills needed to solve real-world problems. Emphasizing a pragmatic approach, the book delivers critical content in a convenient format and presents on-the-job topics of importance to the chemical engineer of tomorrow—OM&I (operation, maintenance, and inspection) procedures, nanotechnology, how to purchase equipment, legal considerations, the need for a second language and for oral and written communication skills, and ABET (Accreditation Board for Engineering and Technology) topics for practicing engineers. This is an indispensable resource for anyone working as a chemical engineer or planning to enter the field. Praise for Chemical Engineering: The Essential Reference: “Current and relevant... over a dozen topics not normally addressed... invaluable to my work as a consultant and

educator.” —Kumar Ganesan, Professor and Department Head, Department of Environmental Engineering, Montana Tech of the University of Montana “A much-needed and unique book, tough not to like... loaded with numerous illustrative examples... a book that looks to the future and, for that reason alone, will be of great interest to practicing engineers.” —Anthony Buonicore, Principal, Buonicore Partners Coverage includes: Basic calculations and key tables Process variables Numerical methods and optimization Oral and written communication Second language(s) Chemical engineering processes Stoichiometry Thermodynamics Fluid flow Heat transfer Mass transfer operations Membrane technology Chemical reactors Process control Process design Biochemical technology Medical applications Legal considerations Purchasing equipment Operation, maintenance, and inspection (OM&I) procedures Energy management Water management Nanotechnology Project management Environment management Health, safety, and accident management Probability and statistics Economics and finance Ethics Open-ended problems Transportation Biofuels National Academies Press Fuels and combustion. Gas producers. Sulfur compounds. Metallurgy. Crystallization.

Shreve's Chemical Process Industries PHI Learning Pvt. Ltd.

Substantially revising and updating the classic reference in the field, this handbook offers a valuable overview and myriad details on current chemical processes, products, and practices. No other source offers as much data on the chemistry, engineering, economics, and infrastructure of the industry. The Handbook serves a spectrum of individuals, from those who are directly involved in the chemical industry to others in related industries and activities. It provides not only the underlying science and technology for important industry sectors, but also broad coverage of critical supporting topics. Industrial processes and products can be much enhanced through observing the tenets and applying the methodologies found in chapters on Green Engineering and Chemistry (specifically, biomass conversion), Practical Catalysis, and Environmental Measurements; as well as expanded treatment of Safety, chemistry plant security, and Emergency Preparedness. Understanding these factors allows them to be part of the total process and helps achieve optimum results in, for example, process development, review, and modification. Important topics in the energy field, namely nuclear, coal, natural gas, and petroleum, are covered in individual chapters. Other new chapters include energy conversion, energy storage, emerging nanoscience and technology. Updated sections include more material on biomass conversion, as well as three chapters covering biotechnology topics, namely, Industrial Biotechnology, Industrial Enzymes, and Industrial Production of Therapeutic Proteins.

Tank Linings for Chemical Process Industries Springer Science & Business Media

This book offers an insight into three promising and innovative

pathways for the biological production of biodiesel, ethanol and methane.

From Industrial Strategies to Production Resources Management, Through the Industrialization Process and Supply Chain to Pursue Value Creation Elsevier

"The fourth edition of Elements of Chemical Reaction Engineering is a completely revised version of the book. It combines authoritative coverage of the principles of chemical reaction engineering with an unsurpassed focus on critical thinking and creative problem solving, employing open-ended questions and stressing the Socratic method. Clear and organized, it integrates text, visuals, and computer simulations to help readers solve even the most challenging problems through reasoning, rather than by memorizing equations." --BOOK JACKET.

Chemical Process Industries Wiley Global Education

This book is about Sulph(on)ation Technology in its technical entirety, aiming at superiority in final product quality, raw material utilisation, sustained plant reliability and safety, minimisation of liquid effluent and gaseous emissions; it is about the total quality of the operation. It will be of value to engineers and chemists who are, or will be, involved in the practical daily operation of sulphonation plants or R&D activities. The book can also be used as a tool for the teacher in preparing final year projects in a chemical engineering curriculum. The book covers sulphonation of alkylbenzenes, primary alcohols, alcohol ethers, alpha-olefins and fatty acid methyl esters, with a strong emphasis on the sulphur-based S~/air sulphonation technology. The first part deals with raw material specifications, hazards, storage, handling and physical properties. In the following section the process chemistry is discussed, indicating main chemical reactions, undesired parallel and consecutive reactions, exothermal heat effects and all other process chemistry data that are relevant for process selection and equipment design. The section about the actual process equipment from the various plant equipment suppliers (Ballestra, Chemithon, Mazzoni, Meccaniche Modeme and Lion Corp.) takes into account the chemical reaction engineering aspects derived from the sulphonation technology processing chemistry. Product quality, product storage and handling, product safety and physical properties are the contents of the next section. The effluent handling and exhaust gas treatment of the SO₂/air sulphonation technology are further discussed in detail.

Chemical Reaction Engineering Pearson Educación

This book has proved its worth over the years as a text for courses in Production Management at the Faculty of Automotive Engineering in Turin, Italy, but deserves a wider audience as it presents a compendium of basics on Industrial Management, since it covers all major topics required. It treats all subjects from product development and “make or buy”-decision strategies to the manufacturing systems setting and management through analysis of the main resources needed

in production and finally exploring the supply chain management and the procurement techniques. The very last chapter recapitulates the previous ones by analysing key management indicators to pursue the value creation that is the real purpose of every industrial enterprise. As an appendix, a specific chapter is dedicated to the basics of production management where all main relevant definitions, techniques and criteria are treated, including some numerical examples, in order to provide an adequate foundation for understanding the other chapters. This book will be of use not only to Automotive Engineering students but a wide range of readers who wish to gain insight in the world of automotive engineering and the automotive industry in general.