

Petroleum Engineering H Volume 4

A guide to the development and manufacturing of pharmaceutical products written for professionals in the industry, revised second edition The revised and updated second edition of Chemical Engineering in the Pharmaceutical Industry is a practical book that highlights chemistry and chemical engineering. The book 's regulatory quality strategies target the development and manufacturing of pharmaceutically active ingredients of pharmaceutical products. The expanded second edition contains revised content with many new case studies and additional example calculations that are of interest to chemical engineers. The 2nd Edition is divided into two separate books: 1) Active Pharmaceutical Ingredients (API 's) and 2) Drug Product Design, Development and Modeling. The active pharmaceutical ingredients book puts the focus on the chemistry, chemical engineering, and unit operations specific to development and manufacturing of the active ingredients of the pharmaceutical product. The drug substance operations section includes information on chemical reactions, mixing, distillations, extractions, crystallizations, filtration, drying, and wet and dry milling. In addition, the book includes many applications of process modeling and modern software tools that are geared toward batch-scale and continuous drug substance pharmaceutical operations. This updated second edition:

- Contains 30 new chapters or revised chapters specific to API, covering topics including: manufacturing quality by design, computational approaches, continuous manufacturing, crystallization and final form, process safety
- Expanded topics of scale-up, continuous processing, applications of thermodynamics and thermodynamic modeling, filtration and drying
- Presents updated and expanded example

calculations • Includes contributions from noted experts in the field Written for pharmaceutical engineers, chemical engineers, undergraduate and graduate students, and professionals in the field of pharmaceutical sciences and manufacturing, the second edition of *Chemical Engineering in the Pharmaceutical Industry* focuses on the development and chemical engineering as well as operations specific to the design, formulation, and manufacture of drug substance and products.

The publication of the third edition of 'Chemical Engineering Volume 3' marks the completion of the re-orientation of the basic material contained in the first three volumes of the series. Volume 3 is devoted to reaction engineering (both chemical and biochemical), together with measurement and process control. This text is designed for students, graduate and postgraduate, of chemical engineering.

Chemical Engineering and Chemical Process Technology is a theme component of Encyclopedia of Chemical Sciences, Engineering and Technology Resources in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty Encyclopedias. Chemical engineering is a branch of engineering, dealing with processes in which materials undergo changes in their physical or chemical state. These changes may concern size, energy content, composition and/or other application properties. Chemical engineering deals with many processes belonging to chemical industry or related industries (petrochemical, metallurgical, food, pharmaceutical, fine chemicals, coatings and colors, renewable raw materials, biotechnological, etc.), and finds application in manufacturing of such products as acids, alkalis, salts, fuels, fertilizers, crop protection agents, ceramics, glass, paper, colors, dyestuffs, plastics, cosmetics, vitamins and many others. It also plays significant

role in environmental protection, biotechnology, nanotechnology, energy production and sustainable economical development. The Theme on Chemical Engineering and Chemical Process Technology deals, in five volumes and covers several topics such as: Fundamentals of Chemical Engineering; Unit Operations – Fluids; Unit Operations – Solids; Chemical Reaction Engineering; Process Development, Modeling, Optimization and Control; Process Management; The Future of Chemical Engineering; Chemical Engineering Education; Main Products, which are then expanded into multiple subtopics, each as a chapter. These five volumes are aimed at the following five major target audiences: University and College students Educators, Professional practitioners, Research personnel and Policy analysts, managers, and decision makers and NGOs.

Metallurgical & Chemical Engineering

Advances in Composite Materials

Chemical Engineering- Towards Sustainability and Intensification

Chemical Engineering Volume 2

The Journal of Industrial and Engineering Chemistry

Reference Book On Chemical Engineering Vol. II

Excavation, Support and Monitoring is the fourth volume of the five-volume set Rock Mechanics and Engineering and contains twenty-three chapters from key experts in the following fields - Excavation Methods; - Support Technology; - Monitoring Technology; - Integrated Engineering Monitoring and Analysis. The five-volume set “Comprehensive Rock Engineering”, which was published in 1993, has had an important influence on the development of rock mechanics and rock engineering. Significant and extensive advances and achievements in these fields over the last 20 years now justify the publishing of a comparable,

new compilation. Rock Mechanics and Engineering represents a highly prestigious, multi-volume work edited by Professor Xia-Ting Feng, with the editorial advice of Professor John A. Hudson. This new compilation offers an extremely wide-ranging and comprehensive overview of the state-of-the-art in rock mechanics and rock engineering and is composed of peer-reviewed, dedicated contributions by all the key experts worldwide. Key features of this set are that it provides a systematic, global summary of new developments in rock mechanics and rock engineering practices as well as looking ahead to future developments in the fields. Contributors are world-renowned experts in the fields of rock mechanics and rock engineering, though younger, talented researchers have also been included. The individual volumes cover an extremely wide array of topics grouped under five overarching themes: Principles (Vol. 1), Laboratory and Field Testing (Vol. 2), Analysis, Modelling and Design (Vol. 3), Excavation, Support and Monitoring (Vol. 4) and Surface and Underground Projects (Vol. 5). This multi-volume work sets a new standard for rock mechanics and engineering compendia and will be the go-to resource for all engineering professionals and academics involved in rock mechanics and engineering for years to come.

This handbook provides guidelines and practical information on the chemical vapor deposition (CVD) process for surface engineering design, product development, and manufacturing. The first of the 14 chapters discuss the basic principles of CVD thermodynamics and kinetics, stresses and mechanical sta Richardson et al provide the student of chemical engineering with full worked solutions to the problems posed in Chemical Engineering Volume 2 "Particle Technology and Separation Processes" 5th Edition, and Chemical Engineering Volume 3 "Chemical and Biochemical Reactors & Process Control" 3rd Edition. Whilst the main volumes 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 texts. These questions are of both a standard and non-standard nature, and so will prove to be of interest to both

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*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. * Contains fully worked solutions to the problems posed in Chemical Engineering Volumes 2 and 3 * Enables the reader to get the maximum benefit from using Volumes 2 and 3 * An extremely effective method of learning*

Physical Principles of Chemical Engineering

Petroleum Engineer's Guide to Oil Field Chemicals and Fluids

MOLECULAR RECOGNITION: BIOTECHNOLOGY, CHEMICAL ENGINEERING AND MATERIALS APPLICATIONS

Industrial and Engineering Chemistry

Analysis of Natural and Man-Made Materials

The Chemical Trade Journal and Chemical Engineer

Applied Chemistry and Chemical Engineering, Volume 4: Experimental Techniques and Methodical Developments provides a detailed yet easy-to-follow treatment of various techniques useful for characterizing the structure and properties of engineering materials. This timely volume provides an overview of new methods and presents experimental research in applied chemistry using modern approaches. Each chapter describes the principle of the respective method as well as the detailed procedures of experiments with examples of actual applications and then goes on to demonstrate the advantage and disadvantages of each physical technique. Thus, readers will be able to apply the concepts as described in the book to their own

experiments. The book is broken into several subsections: Polymer Chemistry and Technology Computational Approaches Clinical Chemistry and Bioinformatics Special Topics This volume presents research and reviews and information on implementing and sustaining interdisciplinary studies in science, technology, engineering, and mathematics.

Some vols., 1920-1949, contain collections of papers according to subject.

Petroleum Engineer's Guide to Oil Field Chemicals and Fluids is a comprehensive manual that provides end users with information about oil field chemicals, such as drilling muds, corrosion and scale inhibitors, gelling agents and bacterial control. This book is an extension and update of Oil Field Chemicals published in 2003, and it presents a compilation of materials from literature and patents, arranged according to applications and the way a typical job is practiced. The text is composed of 23 chapters that cover oil field chemicals arranged according to their use. Each chapter follows a uniform template, starting with a brief overview of the chemical followed by reviews, monomers, polymerization, and fabrication. The different aspects of application, including safety and environmental impacts, for each chemical are also discussed throughout the chapters. The text also includes handy indices for trade names, acronyms and chemicals. Petroleum, production, drilling, completion, and operations engineers and managers will find this book invaluable for project management and production. Non-experts and students in petroleum engineering

will also find this reference useful. Chemicals are ordered by use including drilling muds, corrosion inhibitors, and bacteria control Includes cutting edge chemicals and polymers such as water soluble polymers and viscosity control Handy index of chemical substances as well as a general chemical index

Proceedings of the Thirty-Third Annual Chemical Engineering Symposium of the Division of Industrial and Engineering Chemistry of the American Chemical Society, Held at the University of Cincinnati, on October 20-21, 1966

Mass Transfer in Chemical Engineering Processes

Transactions of the American Institute of Mining, Metallurgical and Petroleum Engineers

Chemical Engineering

I/EC

Chemical Engineering Education and Main Products

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 safety, security and health care in the workplace, as well as aspects of the fields of chemical, 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 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, 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.

Formulas and Calculations for Petroleum Engineering unlocks the capability for a petroleum engineering individual, experienced or not, to solve problems and locate answers, eliminating non-productive time spent searching for that right calculation. Enhanced with lab data experiments, practice examples, and a complimentary online software toolbox, the book presents the most convenient and practical reference for oil and gas phases of a given project. Covering the full spectrum, this reference is a single-point reference to all critical modules, including drilling, production, reservoir engineering, well testing, well logging, enhanced oil recovery, well completion, fracturing, fluid flow, and even petroleum economics. Presents single-point access to petroleum engineering equations, including calculation of modules covering drilling

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completion and fracturing Helps readers understand petroleum economics by including formulas on depreciation rate, cashflow analysis, and the optimum number of development wells

This Book Is In Part I And Part II. The Part I Comprises 189 Tables And Part II, 8 Chapters, Basic Information On Other Engineering Disciplines. The Tables Give Information On Various Materials, Physical Data/Analysis Of Organic And Inorganic Chemicals, Plastics, Minerals, Metals And Many More. The Other Engineering Subjects Give Basic Information On Civil, Mechanical, Electrical And Instrumentation. Basic Information On Elec. Requirement For Explosive Atmosphere As Per IS And IEC/EN Standards Were Given As Well As A Chapter On Glossary Of Terms In Chemistry And Others.

Chemical Engineering in the Pharmaceutical Industry, Active Pharmaceutical Ingredients

Chemical Engineering, Volume 3

Formulas and Calculations for Petroleum Engineering
Mining and Oil Bulletin

Rock Mechanics and Engineering Volume 4

Applied Chemistry and Chemical Engineering, Volume 4 Experimental Techniques and

Methodical Developments CRC Press

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.

Advances in chemical engineering are focused on intensification of reactions, unit operations and mechanical operations. Intensification facilitates reduction in cost, size and increase in conversion, separation and selectivity. In case of distillation, reactive distillation can reduce energy cost and increase product quality considerably compared to conventional reactor-separator method. Similar advantages can be considered for reaction adsorption and other reactive separations. Use of non-renewable energy

sources can reduce burden on conventional feed stocks and reduce carbon foot prints. Nano materials are gaining importance due to their unique properties. Application of nanomaterial for process intensification is being explored in mass transfer, heat transfer and reaction engineering. The composition of flue gases depends on raw material and process. It is important to have adequate knowledge of these aspects while selecting treatment methods. Various chemical conversion methods are effective for the treatment of flue gases. The recovery of components from flue gases involves adsorption, absorption, stripping, and desorption methods. This book contains one chapter on food adulteration also. Food adulteration is very increasing and dangerous phenomenon. It is being practiced from ancient times. Adulteration for maximizing profit is very commonly practiced unethical practice. There is need for increasing moral and ethical values. There is need for people friendly methods for analysing or at least identification of adulterations. Also use of branded items can minimize harms due to adulteration. The chapters in this book are focused on non-renewable energy (chapters 1, 5, 9), water treatment and recycle (chapters 4, 10, 11, 12), use of advanced materials for catalysts (chapters 2, 3, 13), flue gas heat recovery (14), Intensification of unit operations (5, 6, 7, 8) and adulteration in food products.

2013 International Conference on Biological, Medical and Chemical Engineering (BMCE2013)

Applied Chemistry and Chemical Engineering, Volume 4

Solutions to the Problems in Volumes 2 and 3

Coulson and Richardson's Chemical Engineering

Chemical Reaction Engineering

Volume 3A: Chemical and Biochemical Reactors and Reaction Engineering

Advances in Chemical Engineering

Chemical Engineering Process Simulation is ideal for students, early career researchers, and practitioners, as it guides you through chemical processes and unit operations using the main simulation softwares that are used in the industrial sector. This book will help you predict the characteristics of a process using mathematical models and computer-aided process simulation tools, as well as model and simulate process performance before detailed process design takes place. Content coverage includes steady and dynamic simulations, the similarities and differences between process simulators, an introduction to operating units, and convergence tips and tricks. You will also learn about the use of simulation for risk studies to enhance process resilience, fault finding in abnormal situations, and for training operators to control the process in difficult situations. This experienced author team combines industry knowledge with effective teaching methods to make an accessible and clear comprehensive guide to process simulation. Ideal for students, early career researchers, and practitioners, as it guides you through chemical processes and unit operations using the main simulation softwares that are used in the industrial sector. Covers the fundamentals of process simulation, theory, and advanced applications Includes case studies of various difficulty levels to practice and apply

the developed skills Features step-by-step guides to using Aspen Plus and HYSYS for process simulations available on companion site Helps readers predict the characteristics of a process using mathematical models and computer-aided process simulation tools

As Dr Needham's immense undertaking gathers momentum it has been found necessary to subdivide volumes into parts, each to be bound and published separately. The first part of Volume 4, already published, deals with the physical sciences; the second with the diverse applications of physics in the many branches of mechanical engineering; and the third will deal with civil and hydraulic engineering and nautical technology. With this part of Volume 4, then, we come to the application by the Chinese of physical principles in the control of forces and in the use of power; we cross the frontier separating tools from the machine. We have already noticed that the ancient Chinese concept of chhi (somewhat similar to the pneuma of the Greeks) asserted itself prominently in acoustics; but we discover here that the Chinese tendency to think pneumatically was also responsible for a whole range of brilliant technological achievements, for example, the double-acting piston-bellows, the rotary winnowing-fan, and the water-powered metallurgical blowing-machine (ancestor of the steam-engine); as well as for some extraordinary insights and predictions in aeronautics.

Science and Civilisation in China: Volume 4, Physics and Physical Technology, Part 2, Mechanical Engineering

Chemical Engineering and Chemical Process Technology - Volume III

Journal of the International Institute of Technical Bibliography

Excavation, Support and Monitoring
Experimental Techniques and Methodical Developments
Sustainable Development in Chemical Engineering

Composites are made up of constituent materials with high engineering potential. This potential is wide as wide is the variation of materials and structure constructions when new updates are invented every day. Technological advances in composite field are included in the equipment surrounding us daily; our lives are becoming safer, hand in hand with economical and ecological advantages. This book collects original studies concerning composite materials, their properties and testing from various points of view. Chapters are divided into groups according to their main aim. Material properties are described in innovative way either for standard components as glass, epoxy, carbon, etc. or biomaterials and natural sources materials as ramie, bone, wood, etc. Manufacturing processes are represented by moulding methods; lamination process includes monitoring during process. Innovative testing procedures are described in electrochemistry, pulse velocity, fracture toughness in macro-micro mechanical behaviour and more.

Coulson and Richardson 's Chemical Engineering: Volume 3A: Chemical and Biochemical Reactors and Reaction Engineering, Fourth Edition, covers reactor design, flow modelling, gas-liquid and gas-solid reactions and reactors. Captures content converted from textbooks into fully revised reference material Includes content ranging

from foundational through technical Features emerging applications, numerical methods and computational tools

There is much discussion today concerning "Bioengineering" (or "Biomedical Engineering"). It is not exactly clear what these names signify, particularly in chemical engineering. Some have suggested retreading the old war horse "Biochemical Engineering" (or was it "Biomedical Chemical Engineering"). In an effort to demonstrate the on-going activities of chemical engineers in the life science area, we accepted the invitation of the Industrial and Engineering Division of the American Chemical Society to organize the 33rd Annual Chemical Engineering Symposium. We decided to call the symposium, Chemical Engineering in Medicine and Biology, and hence avoided the problem of having to decide which "bio" prefix to use. Many chemical engineers in the academic and industrial world were contacted. From these contacts and a good deal of publicity arose the Symposium. The two-day meeting was held at the University of Cincinnati in the Losantiville Room of the Student Union Building on October 20-21, 1966. Twenty-one papers were presented on topics relating chemical engineering to medicine and biology. The papers were representative of the scope of the activities across the country with presenters coming from Washington, California, Massachusetts, New York, South Carolina, Wisconsin, Iowa, Pennsylvania, Michigan, Indiana and Texas. Topics ranged over blood flow properties, diffusion in blood phenomena, ix INTRODUCTION X mass transfer in the eye, artificial kidney analysis,

separation of bacteria by ion exchange, mathematical modeling of drug distribution, carbon dioxide respiration, photosynthetic kinetics, water in frozen tissues, electrophoretic separation of proteins, and outerspace re search on life support systems.

Information Sources in Engineering

Chemical Engineering and Chemical Process Technology - Volume V

International Series of Monographs in Chemical Engineering

Simultaneous Mass Transfer and Chemical Reactions in Engineering Science

I/EC. Industrial and engineering chemistry

Technology Review

This book offers several solutions or approaches in solving mass transfer problems for different practical chemical engineering applications: measurements of the diffusion coefficients, estimation of the mass transfer coefficients, mass transfer limitation in separation processes like drying, extractions, absorption, membrane processes, mass transfer in the microbial fuel cell design, and problems of the mass transfer coupled with the heterogeneous combustion. I believe this book can provide its readers with interesting ideas and inspirations or direct solutions of their particular problems.

This book offers an overview of the state of the art in the field of DeNOx catalysis in order to focus novel orientations, new technological developments, from laboratory to industrial scale. A particular attention has been paid towards the implementation of

catalytic processes for minimising NO_x emissions either from stationary or mobile sources under lean condition to meet future standard regulations of NO_x emissions. In the first part of this book, critical aspects reported in the literature which usually make difficult the achievement of efficient catalytic technologies in those conditions are summarised and analysed in order two separate new perspectives. The second part deals with fundamental aspects at molecular level. A better understanding of the reactions involved under unsteady-state conditions is probably a pre-requisite step for improving the performances of the actual processes or developing original ones. The development of powerful in situ spectroscopic techniques is of fundamental interest for kinetic modelling. Correlations between spectroscopic and kinetic data with those obtained from theoretical calculations are reported. Some illustrations emphasise the fact that these comparisons may help in determining the nature of the catalytic active sites and building predictive tools for simulations under running conditions. The latter part of this book will be illustrated by different practical approaches covering various aspects related to the catalysts preparation and the development of alternative technologies which include industrial considerations. - New technological developments for investigating catalytic reactions in transient conditions (in situ and operando spectroscopic techniques) - Concerted approaches in DeNO_x catalysis - How academic aspects (kinetic, in situ spectroscopic measurements) can provide useful information for practical applications - Comparison of different approaches provided by academic and

industrial partners

Physical Principles of Chemical Engineering covers the significant advancements in the understanding of the physical principles of chemical engineering. This book is composed of 12 chapters that describe chemical unit processes through analogy with the unit of operations of chemical engineering. The introductory chapters survey the concept and principles of mass and energy balances, as well as the application of entropy. The next chapters deal with the probability and kinetic theories of gases, the physical aspects of solids, the different dispersed systems, and the principles and application of fluid dynamics. Other chapters discuss the property dimension and model theory; heat, mass, and momentum transfer; and the characteristics of multiphase flow processes. The final chapters review the model of rheological bodies, the molecular-kinetic interpretations of rheological behavior, and the principles of reaction kinetics. This book will prove useful to chemical engineers.

Chemical Engineering Problems in Biotechnology

Surface Engineering Series Volume 2: Chemical Vapor Deposition

Fractography-Microscopic Cracking Process

A Weekly Newspaper Devoted to the Commercial Aspect of the Chemical and Allied Industries

MIT's Magazine of Innovation

Engineering Abstracts

Simultaneous Mass Transfer and Chemical Reactions in Engineering Science: Solution Methods and Chemical Engineering Applications illustrates how mathematical analyses, statistics, numerical analysis and computer programming can summarize simultaneous mass transfer and chemical reactions in engineering science for use in solving problems in quantitative Chemical and Biochemical Engineering design and analysis. The book provides statistical methodologies and R recipes for advective and diffusive problems in various geometrical configurations. The R-package Reactran is used to showcase transport models in aquatic systems (rivers, lakes, oceans), porous media (floc aggregates, sediments, ...) and even idealized organisms (spherical cells, cylindrical worms, ...). Presents the basic science of diffusional process and mass transfer, along with simultaneous biochemical and chemical reactions Provides a current working knowledge of simultaneous mass transfer and reactions Describes useful mathematical models on the quantitative assessment of simultaneous mass transfer and reactions Focuses on the analysis of systems of simultaneous mass transfer and reactions, discussing the existence and uniqueness of solutions to well-known theoretical models This proceeding is indeed the result of remarkable cooperation of many distinguished experts, who came together to contribute their research work and comprehensive, in-depth and up to date review articles. We

are thankful to all the contributing authors and co-authors for their valued contribution to this book. We would also like to express our gratitude to all the publishers and authors and others for granting us the copyright permissions to use their illustrations. 2013 International Conference on Biological, Medical and Chemical Engineering (BMCE2013) which will be held on December 1-2, 2013, Hong Kong, aims to provide a forum for accessing to the most up-to-date and authoritative knowledge from both Biological, Medical and Chemical Engineering. The dynamic Hong Kong, officially the Hong Kong Special Administrative Region of the People's Republic of China, is a largely self-governing territory of the People's Republic of China (PRC), facing the Guangdong Province in the north and the South China Sea to the east, west and south. Under the "one country, two systems" policy, Hong Kong enjoys considerable autonomy in all areas with the exception of foreign affairs and defense (which are the responsibility of the PRC Government). As part of this arrangement, Hong Kong continues to maintain its own currency, separate legal, political systems and other aspects that concern its way of life, many of which are distinct from those of mainland China. In relation with the title of this proceeding, Biological and Medical Engineering, Developmental biology, Environmental Biology, Evolutionary Biology, Marine Biology, Chemistry and Chemical Engineering Fundamentals, Chemical engineering

educational challenges and development, Chemical reaction engineering, Chemical engineering equipment design and process design, Thermodynamics, Catalysis & reaction engineering, Advances in computational & numerical methods, Systems biology, Integration of Life Sciences & Engineering, Multi-scale and Multi-disciplinary Approaches, Controlled release of the active ingredient, Energy & nuclear sciences, Energy and environment, CFD & chemical engineering, Food engineering etc, has been targeted and included in this proceeding. The proceeding is the results of the contribution of a number of experts from the international scientific community in the respective field of research.

Sustainable development is an area that has world-wide appeal, from developed industrialized countries to the developing world. Development of innovative technologies to achieve sustainability is being addressed by many European countries, the USA and also China and India. The need for chemical processes to be safe, compact, flexible, energy efficient, and environmentally benign and conducive to the rapid commercialization of new products poses new challenges for chemical engineers. This book examines the newest technologies for sustainable development in chemical engineering, through careful analysis of the technical aspects, and discussion of the possible fields of industrial development. The book is broad in its coverage, and is divided into

four sections: Energy Production, covering renewable energies, innovative solar technologies, cogeneration plants, and smart grids Process Intensification, describing why it is important in the chemical and petrochemical industry, the engineering approach, and nanoparticles as a smart technology for bioremediation Bio-based Platform Chemicals, including the production of bioethanol and biodiesel, bioplastics production and biodegradability, and biosurfactants Soil and Water Remediation, covering water management and re-use, and soil remediation technologies Throughout the book there are case studies and examples of industrial processes in practice.

Chemical and Biochemical Reactors and Process Control

Past and Present in DeNO_x Catalysis: From Molecular Modelling to Chemical Engineering

Chemical Engineering in Medicine and Biology

Innovative Technologies

Chemical Engineering Process Simulation

Solution Methods and Chemical Engineering Applications