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Chemical Engineering Design - Gavin Towler 2012-01-25

Chemical Engineering Design, Second Edition, deals with the application of chemical engineering principles to the design of chemical processes and equipment. Revised throughout, this edition has been specifically developed for the U.S. market. It provides the latest US codes and standards, including API, ASME and ISA design codes and ANSI standards. It contains new discussions of conceptual plant design, flowsheet development, and revamp design; extended coverage of capital cost estimation, process costing, and economics; and new chapters on equipment selection, reactor design, and solids handling processes. A rigorous pedagogy assists learning, with detailed worked examples, end of chapter exercises, plus supporting data, and Excel spreadsheet calculations, plus over 150 Patent References for downloading from the companion website. Extensive instructor resources, including 1170 lecture slides and a fully worked solutions manual are available to adopting instructors. This text is designed for chemical and biochemical engineering students (senior undergraduate year, plus appropriate for capstone design courses where taken, plus graduates) and lecturers/tutors, and professionals in industry (chemical process, biochemical, pharmaceutical, petrochemical sectors). New to this edition: Revised organization into Part I: Process Design, and Part II: Plant Design. The broad themes of Part I are flowsheet development, economic analysis, safety and environmental impact and optimization. Part II contains chapters on equipment design and selection that can be used as supplements to a lecture course or as essential references for students or practicing engineers working on design projects. New discussion of conceptual plant design, flowsheet development and revamp design Significantly increased coverage of capital cost estimation, process costing and economics New chapters on equipment selection, reactor design and solids handling processes New sections on fermentation, adsorption, membrane separations, ion exchange and chromatography Increased coverage of batch processing, food, pharmaceutical and biological processes All equipment chapters in Part II revised and updated with current information Updated throughout for latest US codes and standards, including API, ASME and ISA design codes and ANSI standards Additional worked examples and homework problems The most complete and up to date coverage of equipment selection 108 realistic commercial design projects from diverse industries A rigorous pedagogy assists learning, with detailed worked examples, end of chapter exercises, plus supporting data and Excel spreadsheet calculations plus over 150 Patent References, for downloading from the companion website Extensive instructor resources: 1170 lecture slides plus fully worked solutions manual available to adopting instructors

Electrochemical Engineering - Thomas F. Fuller 2018-03-20

A Comprehensive Reference for Electrochemical Engineering Theory and Application From chemical and electronics manufacturing, to hybrid vehicles, energy storage, and beyond, electrochemical engineering touches many industries—any many lives—every day. As energy conservation becomes of central importance, so too does the science that helps us reduce consumption, reduce waste, and lessen our impact on the planet. Electrochemical Engineering provides a reference for scientists and engineers working with electrochemical processes, and a rigorous, thorough text for graduate students and upper-division undergraduates. Merging theoretical concepts with widespread application, this book is designed to provide critical knowledge in a real-world context. Beginning with the fundamental principles underpinning the field, the discussion moves into industrial and manufacturing processes that blend central ideas to provide an advanced understanding while explaining observable results. Fully-worked illustrations simplify

complex processes, and end-of chapter questions help reinforce essential knowledge. With in-depth coverage of both the practical and theoretical, this book is both a thorough introduction to and a useful reference for the field. Rigorous in depth, yet grounded in relevance, Electrochemical Engineering: Introduces basic principles from the standpoint of practical application Explores the kinetics of electrochemical reactions with discussion on thermodynamics, reaction fundamentals, and transport Covers battery and fuel cell characteristics, mechanisms, and system design Delves into the design and mechanics of hybrid and electric vehicles, including regenerative braking, start-stop hybrids, and fuel cell systems Examines electrodeposition, redox-flow batteries, electrolysis, regenerative fuel cells, semiconductors, and other applications of electrochemical engineering principles Overlapping chemical engineering, chemistry, material science, mechanical engineering, and electrical engineering, electrochemical engineering covers a diverse array of phenomena explained by some of the important scientific discoveries of our time. Electrochemical Engineering provides the critical understanding required to work effectively with these processes as they become increasingly central to global sustainability.

Engineering Chemistry - R. V. Gadag 2010-09-30

Some chapters in the book deal with the basic principles of chemistry while others are focused on its applied aspects, providing the correct interphase between the principles of chemistry and engineering. KEY FEATURES * Chapters cover both basic principles of chemistry as also its applied aspects. * Written in easy self-explanatory language and in depth at the same time. * Review questions provided at the end of each chapter. * A separate section 'Laboratory Manual' in Engineering Chemistry comprising 12 experiments is appended at the end of the book.

Basic Chemistry Calculations: A Book for Chemistry and Chemical Engineering Students - Kingsley Augustine 2019-01-11

Basic Chemistry Calculations is intended to help students overcome the challenges associated with solving problems in chemistry. This book contains numerous solved problems in some important areas of chemistry. These worked examples will really improve students understanding in the aspect of calculations in chemistry. This boom will be useful to students in high schools and higher institutions of learning. It will also be a useful guide for students of chemical engineering in order to improve their chemistry calculation skills which is required for proper understanding of chemical engineering calculations. The worked examples in this book are presented in a simple, logical and self-explanatory manner that will impart students with the required numerical skills for excelling in chemistry and chemical engineering calculations. Exercises are presented at the end of each topic in order for students to attempt and assess themselves. The topics covered in this book include: CALCULATIONS ON MOLE FRACTION AND MASS FRACTION CALCULATIONS ON AVERAGE MOLECULAR MASS OF MIXED COMPOUNDS/MOLECULES CALCULATIONS INVOLVING COMBUSTION CALCULATIONS INVOLVING LIMITING REACTANTS CALCULATIONS INVOLVING THE FORMULA OF COMPOUND EQUILIBRIUM REACTION CALCULATION These topics are well simplified with the numerous worked examples explained in a step-by-step order under them. A thorough study of this textbook will definitely improve your calculation skills in chemistry

A Textbook of Engineering Chemistry (For 1st Semester of Anna University) - Dhara S.S. & Umare S.S.

A Textbook of Engineering Chemistry

Physical Chemistry for Engineering and Applied Sciences - Frank R. Foulkes 2012-09-12

Physical Chemistry for Engineering and Applied Sciences is the product of over 30 years of teaching first-year Physical Chemistry as part of the Faculty of Applied Science and Engineering at the University of Toronto. Designed to be as rigorous as compatible with a first-year student's ability to understand, the text presents detailed step-by-step

Basic of Engineering Chemistry (For RGPV, Bhopal) - Dara S.S. & Singh A.K. 2004

Water And Its Industrial Applications | Fuels And Combustion | Lubricants | Cement And Refractories| Polymers | Instrumental Techniques In Chemical Analysis | Water Analysis Techniques | Question Bank *Engineering Chemistry* - Dr. Mukul Burghate

Having basic knowledge on all the concepts of Chemistry for engineering students is must need, it makes them as a professional and expert engineer in various design and material fields, along with the usage of available resources. Hence, top government & private universities, small institutes include Engineering Chemistry Subject in 1st semester to provide a basic understanding of the chemical engineering. The purpose of this textbook is to present an introduction to the subject of Engineering Chemistry of Bachelor of Engineering (BE) Semester-I. The book contains the syllabus from basics of the subjects going into the complexities of the subjects. All the concepts have been explained with relevant examples and diagrams to make it interesting for the readers. An attempt is made here by the experts of TMC to assist the students by way of providing Study text as per the curriculum with non-commercial considerations. We owe to many websites and their free contents; we would like to specially acknowledge contents of website www.wikipedia.com and various authors whose writings formed the basis for this book. We acknowledge our thanks to them. At the end we would like to say that there is always a room for improvement in whatever we do. We would appreciate any suggestions regarding this study material from the readers so that the contents can be made more interesting and meaningful. Readers can email their queries and doubts to tmcnagpur@gmail.com. We shall be glad to help you immediately.

Laboratory Manual For Engineering Chemistry (For Bput) - Patra B.B. 2010-09

Comprehensive Engineering Chemistry - Devender Singh 2013-12-30

This book is designed to meet the requirement of the students of B.Tech and B.E. students. The book discusses in detail the following topics: Thermodynamics Phase Rule, Water and its Treatment, Corrosion and its Prevention, Lubrication and Lubricants, Polymer and Polymerization and Analytical Methods. The book is suitably illustrated with diagrams and a number of solved numerical examples from different universities are included to make the text more exhaustive and understandable. Practical part is also appended at the end of the book.

Green Chemistry and Engineering - Mukesh Doble 2010-07-27

Chemical processes provide a diverse array of valuable products and materials used in applications ranging from health care to transportation and food processing. Yet these same chemical processes that provide products and materials essential to modern economies, also generate substantial quantities of wastes and emissions. Green Chemistry is the utilization of a set of principles that reduces or eliminate the use or generation of hazardous substances in design. Due to extravagant costs needed to managing these wastes, tens of billions of dollars a year, there is a need to propose a way to create less waste. Emission and treatment standards continue to become more stringent, which causes these costs to continue to escalate. Green Chemistry and Engineering describes both the science (theory) and engineering (application) principles of Green Chemistry that lead to the generation of less waste. It explores the use of milder manufacturing conditions resulting from the use of smarter organic synthetic techniques and the maintenance of atom efficiency that can temper the effects of chemical processes. By implementing these techniques means less waste, which will save industry millions of dollars over time. Chemical processes that provide products and materials essential to modern economies generate substantial quantities of wastes and emissions, this new book describes both the science (theory) and engineering (application) principles of Green Chemistry that lead to the generation of less waste This book contains expert advise from scientists around the world, encompassing developments in the field since 2000 Aids manufacturers, scientists, managers, and engineers on how to implement ongoing changes in a vast developing field that is

important to the environment and our lives

Engineering Chemistry - Shikha Agarwal 2019-05-23

Written in lucid language, the book offers a detailed treatment of fundamental concepts of chemistry and its engineering applications.

Industrial & Engineering Chemistry - 1925

A TEXTBOOK OF ENGINEERING CHEMISTRY - SYAMALA SUNDAR DARA 2008

Any good text book, particularly that in the fast changing fields such as engineering & technology, is not only expected to cater to the current curricular requirements of various institutions but also should provide a glimpse towards the latest developments in the concerned subject and the relevant disciplines. It should guide the periodic review and updating of the curriculum.

Introduction to Chemical Engineering Analysis Using Mathematica - Henry C. Foley 2021-06-16

Introduction to Chemical Engineering Analysis Using Mathematica, Second Edition reviews the processes and designs used to manufacture, use, and dispose of chemical products using Mathematica, one of the most powerful mathematical software tools available for symbolic, numerical, and graphical computing. Analysis and computation are explained simultaneously. The book covers the core concepts of chemical engineering, ranging from the conservation of mass and energy to chemical kinetics. The text also shows how to use the latest version of Mathematica, from the basics of writing a few lines of code through developing entire analysis programs. This second edition has been fully revised and updated, and includes analyses of the conservation of energy, whereas the first edition focused on the conservation of mass and ordinary differential equations. Offers a fully revised and updated new edition, extended with conservation of energy Covers a large number of topics in chemical engineering analysis, particularly for applications to reaction systems Includes many detailed examples Contains updated and new worked problems at the end of the book Written by a prominent scientist in the field

An Introduction to Materials Engineering and Science for Chemical and Materials Engineers - Brian S. Mitchell 2004-01-30

An Introduction to Materials Engineering and Science for Chemical and Materials Engineers provides a solid background in materials engineering and science for chemical and materials engineering students. This book: Organizes topics on two levels; by engineering subject area and by materials class. Incorporates instructional objectives, active-learning principles, design-oriented problems, and web-based information and visualization to provide a unique educational experience for the student. Provides a foundation for understanding the structure and properties of materials such as ceramics/glass, polymers, composites, biomaterials, as well as metals and alloys. Takes an integrated approach to the subject, rather than a "metals first" approach.

Rapid Review of Chemistry for the Life Sciences and Engineering - Armen S. Casparian 2021-12-15

To understand, maintain, and protect the physical environment, a basic understanding of chemistry, biology, and physics, and their hybrids is useful. Rapid Review of Chemistry for the Life Sciences and Engineering demystifies chemistry for the non-chemist who, nevertheless, may be a practitioner of some area of science or engineering requiring or involving chemistry. It provides quick and easy access to fundamental chemical principles, quantitative relationships, and formulas. Armed with select, contemporary applications, it is written in the hope to bridge a gap between chemists and non-chemists, so that they may communicate with and understand each other. Chapters 1-10 are designed to contain the standard material in an introductory college chemistry course. Chapters 11-15 present applications of chemistry that should interest and appeal to scientists and engineers engaged in a variety of fields. Additional features More than 100 solved examples clearly illustrated and explained with SI units and conversion to other units using conversion tables included Assists the reader to understand organic and inorganic compounds along with their structures, including isomers, enantiomers, and congeners of organic compounds Provides a quick and easy access to basic chemical concepts and specific examples of solved problems This concise, user-friendly review of general and organic chemistry with environmental applications will be of interest to all disciplines and backgrounds.

The Chemistry of Environmental Engineering - Johannes Karl Fink 2020-04-07

The focus of this book is the chemistry of environmental engineering and its applications, with a special emphasis on the use of polymers in this field. It explores the creation and use of polymers with special properties such as viscoelasticity and interpenetrating networks; examples of which include the creation of polymer-modified asphalt as well as polymers with bacterial adhesion properties. The text contains the issues of polymerization methods, recycling methods, wastewater treatment, types of contaminants, such as microplastics, organic dyes, and pharmaceutical residues. After a detailed overview of polymers in Chapter 1, their special properties are discussed in the following chapter. Among the topics is the importance of polymers to water purification procedures, since their use in the formation of reverse osmosis membranes do not show biofouling. Chapter 3 details special processing methods, such as atom transfer radical polymerization, enzymatic polymerization, plasma treatment, and several other methods, can be used to meet the urgent demands of industrial applications. Chapter 4 addresses the important environmental issue of recycling methods as they relate to several types of materials such as PET bottles, tire rubbers, asphalt compositions, and other engineering resins. And wastewater treatment is detailed in Chapter 5, in which the types of contaminants, such as microplastics, organic dyes and pharmaceutical residues, are described and special methods for their proper removal are detailed along with types of adsorbents, including biosorbents. Still another important issue for environmental engineering chemistry is pesticides. Chapter 6 is a thorough description of the development and fabrication of special sensors for the detection of certain pesticides. A detailed presentation of the electrical uses of polymer-based composites is given in Chapter 7, which include photovoltaic materials, solar cells, energy storage and dielectric applications, light-emitting polymers, and fast-charging batteries. And recent issues relating to food engineering, such as food ingredient tracing, protein engineering, biosensors and electronic tongues, are presented in Chapter 8. Finally, polymers used for medical applications are described in Chapter 9. These applications include drug delivery, tissue engineering, porous coatings and also the special methods used to fabricate such materials.

Green Chemistry and Engineering - Concepción Jiménez-González 2011-04-12

The past, present, and future of green chemistry and green engineering From college campuses to corporations, the past decade witnessed a rapidly growing interest in understanding sustainable chemistry and engineering. Green Chemistry and Engineering: A Practical Design Approach integrates the two disciplines into a single study tool for students and a practical guide for working chemists and engineers. In Green Chemistry and Engineering, the authors—each highly experienced in implementing green chemistry and engineering programs in industrial settings—provide the bottom-line thinking required to not only bring sustainable chemistry and engineering closer together, but to also move business towards more sustainable practices and products. Detailing an integrated, systems-oriented approach that bridges both chemical syntheses and manufacturing processes, this invaluable reference covers: Green chemistry and green engineering in the movement towards sustainability Designing greener, safer chemical synthesis Designing greener, safer chemical manufacturing processes Looking beyond current processes to a lifecycle thinking perspective Trends in chemical processing that may lead to more sustainable practices The authors also provide real-world examples and exercises to promote further thought and discussion. The EPA defines green chemistry as the design of chemical products and processes that reduce or eliminate the use or generation of hazardous substances. Green engineering is described as the design, commercialization, and use of products and processes that are feasible and economical while minimizing both the generation of pollution at the source and the risk to human health and the environment. While there is no shortage of books on either discipline, Green Chemistry and Engineering is the first to truly integrate the two.

Corrosion Chemistry - Volkan Cicek 2011-11-29

Corrosion Chemistry details the scientific background of the corrosion process and contemporary applications for dealing with corrosion for engineers and scientists, covering the most recent breakthroughs and trends. Corrosion is in essence a chemical process, and it is crucial to understand the dynamics from a chemical perspective before proceeding with analyses, designs and solutions from an engineering aspect. This book can be used both as a textbook and a reference book both by academics and engineers and scientists in the field. As a reference for the engineer in the field, it is both a refresher for the veteran on the causes of corrosion and the methods, processes, and technologies to deal with it, over a variety of industries. It is the most up-to-date, comprehensive treatment of corrosion available, covering the most cutting-

edge new processes and theories. For the freshman engineer just entering the field, it is a tremendous introduction to corrosion. As a textbook, it can be used for a single semester technical elective course in undergraduate and postgraduate education for disciplines such as chemistry, chemical engineering, petroleum engineering, civil engineering, material engineering, mechanical engineering, metallurgical engineering, mining engineering, agricultural engineering, and other related technical fields.

Chemistry for Technologists - G. R. Palin 2014-05-17

Chemistry for Technologists provides a basic text on chemical principles written specifically for the technologists. The topics covered are those of basic chemistry. Definitions of such terms as chemical reactions, stoichiometry, and atomic structures are made simple so as not to require prior technical background of the subject. The book introduces the student to topics such as structural chemistry, physical chemistry, organic chemistry, and inorganic chemistry. A chapter on analytical chemistry is also provided. The chapter focuses on method of analysis such as routine methods, electrometric methods, and chromatographic methods. Chromatography is a type of separation method, which is discussed in detail. Different types of chromatography are also enumerated. The waves mechanics and hydrogen atom are fully covered. The electronic nature of bonding and bonding between two hydrogen atoms are discussed in detail. The ionic crystals, molecular crystals, and covalent crystals are presented completely. The text will be a useful tool for technology students and practising technologists.

Chemistry For Engineers - Teh Fu Yen 2008-01-02

Engineering requires applied science, and chemistry is the center of all science. The more chemistry an engineer understands, the more beneficial it is. In the future, global problems and issues will require an in-depth understanding of chemistry to have a global solution. This book aims at bridging the concepts and theory of chemistry with examples from fields of practical application, thus reinforcing the connection between science and engineering. It deals with the basic principles of various branches of chemistry, namely, physical chemistry, inorganic chemistry, organic chemistry, analytical chemistry, surface chemistry, biochemistry, geochemistry, fuel chemistry, polymer chemistry, cement chemistry, materials chemistry, and asphalt chemistry. Written primarily for use as a textbook for a university-level course, the topics covered here provide the fundamental tools necessary for an accomplished engineer. /a

ENGINEERING CHEMISTRY FOR DIPLOMA - RANJAN KUMAR MOHAPATRA 2014-09-10

This book is written strictly for the first and second semester diploma students of engineering chemistry according to the revised syllabus. It aims to provide a thorough understanding of the chemical concepts, theories and principles in Engineering Chemistry in a clear and concise manner, so that the average students are able to grasp the intricacies of the subject. Explaining general concepts of atomic structure and chemical bond, the book covers all advanced topics such as acid-base theory, concentration of solutions, electrochemistry, corrosion, metallurgy, hydrocarbons, sources of water and its treatment, lubricants and adhesives, fuel, polymer and environmental chemistry. Each theoretical concept is well supported by illustrative examples. Besides, the book provides a large number of solved problems to reinforce the theoretical understanding of concepts. Each chapter contains glossary terms and provides short questions and long questions for practice. Previous year question papers and model questions with answers are appended at the end of the book to help students ace in examinations.

Engineering Chemistry I (WBUT), 3rd Edition - Gourkrishna Das Mohapatra

Engineering Chemistry I has been primarily written for first year B.Tech students but can also be used by BSc and MSc students to clarify their fundamental knowledge. The book begins with the basic theories of chemistry in various disciplines in order to provide a necessary background for dealing with a number of different physiochemical phenomena. Key Features 1. Brief discussion of the concepts 2. Coverage of syllabus in totality 3. Examination-oriented approach 4. Large number of solved problems 5. Solution to previous year's question papers 6. Exercises at the end of each chapter

Explosives Engineering - Paul W. Cooper 2018-07-19

This graduate text, and Cooper's companion introductory text ('Introduction to the Technology of Explosives'), serve the same markets as the successful explosives reference by Meyer, now in its 4th edition. VCH also published the International Journal of Propellants, Explosives, and Pyrotechnics. The resulting package would give VCH the major presence in the field. This text presents the basic technologies

used in the engineering of explosives and explosive systems, i.e., chemistry, burning, detonation, shock waves, initiation theories, scaling. The book is written for upper-division undergraduate or graduate-level scientists and engineers, and assumes a good grasp of basic physics, chemistry, mechanics and mathematics through calculus. It is based on lecture notes used for graduate courses at the Dept. of Energy Laboratories, and could serve as a core text for a course at schools of mining or military engineering. The intent of the book is to provide the engineer or scientist in the field with an understanding of the phenomena involved and the engineering tools needed to solve/ design/ analyze a broad range of real problems.

Machine Learning in Chemistry - Jon Paul Janet 2020-05-28

Recent advances in machine learning or artificial intelligence for vision and natural language processing that have enabled the development of new technologies such as personal assistants or self-driving cars have brought machine learning and artificial intelligence to the forefront of popular culture. The accumulation of these algorithmic advances along with the increasing availability of large data sets and readily available high performance computing has played an important role in bringing machine learning applications to such a wide range of disciplines. Given the emphasis in the chemical sciences on the relationship between structure and function, whether in biochemistry or in materials chemistry, adoption of machine learning by chemists. Machine Learning in Chemistry focuses on the following to launch your understanding of this highly relevant topic: Topics most relevant to chemical sciences are the focus. Focus on concepts rather than technical details. Comprehensive referencing provides sources to go to for more technical details. Key details about methods that underlie machine learning (not easy, but important to understand the strengths as well as the limitations of these methods and to identify where domain knowledge can be most readily applied. Familiarity with basic single variable calculus and in linear algebra will be helpful although we have provided step-by-step derivations where they are important

A TEXTBOOK OF ENGINEERING CHEMISTRY - SYAMALA SUNDAR DARA 2008

Any good text book, particularly that in the fast changing fields such as engineering & technology, is not only expected to cater to the current curricular requirements of various institutions but also should provide a glimpse towards the latest developments in the concerned subject and the relevant disciplines. It should guide the periodic review and updating of the curriculum.

Chemical and Catalytic Reaction Engineering - James J. Carberry 2001-01-01

Designed to give chemical engineers background for managing chemical reactions, this text examines the behavior of chemical reactions and reactors; conservation equations for reactors; heterogeneous reactions; fluid-fluid and fluid-solid reaction systems; heterogeneous catalysis and catalytic kinetics; diffusion and heterogeneous catalysis; and analyses and design of heterogeneous reactors. 1976 edition.

General Chemistry for Engineers - James O. Glanville 2002

Emphasizing problem-solving and engineering approximation, this chemistry book provides engineers with an understanding of the entities (atoms, molecules, and ions) that are relevant to their lives and professional careers. Throughout the book, internet key word searching and graphing exercises take advantage of users' existing computer skills and encourages them to acquire new ones in designing, preparing, and interpreting graphs. Chapter topics cover atoms, elements, and measurements; nuclides, molecules, and ions; chemical reaction and stoichiometry; gases; quantum mechanics, and the periodic table; chemical bonding and chemical structure; chemical energy and the first law of thermodynamics; the second law of thermodynamics and chemical equilibrium; gas and solution equilibria; liquids and their mixtures; solids; phase diagrams and solutions; the periodic table and redox chemistry; electrochemistry; and rate processes. For engineers preparing for the professional certification exam.

Chemistry for Engineering Students - Lawrence S. Brown 2014-01-01

CHEMISTRY FOR ENGINEERING STUDENTS, connects chemistry to engineering, math, and physics; includes problems and applications specific to engineering; and offers realistic worked problems in every chapter that speak to your interests as a future engineer. Packed with built-in study tools, this textbook gives you the resources you need to master the material and succeed in the course. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Chemical and Bioprocess Engineering - Ricardo Simpson 2013-12-04

The goal of this textbook is to provide first-year engineering students with a firm grounding in the fundamentals of chemical and bioprocess engineering. However, instead of being a general overview of the two topics, Fundamentals of Chemical and Bioprocess Engineering will identify and focus on specific areas in which attaining a solid competency is desired. This strategy is the direct result of studies showing that broad-based courses at the freshman level often leave students grappling with a lot of material, which results in a low rate of retention. Specifically, strong emphasis will be placed on the topic of material balances, with the intent that students exiting a course based upon this textbook will be significantly higher on Bloom's Taxonomy (knowledge, comprehension, application, analysis and synthesis, evaluation, creation) relating to material balances. In addition, this book also provides students with a highly developed ability to analyze problems from the material balances perspective, which leaves them with important skills for the future. The textbook consists of numerous exercises and their solutions. Problems are classified by their level of difficulty. Each chapter has references and selected web pages to vividly illustrate each example. In addition, to engage students and increase their comprehension and rate of retention, many examples involve real-world situations.

Applied Chemistry - Oleg Roussak 2012-09-27

This updated edition of Gesser's classic textbook has undergone a full revision and now has the latest material, including new chapters on semiconductors and nanotechnology. It includes a supplementary laboratory section with stepwise experimental protocols.

Engineering Fluid Mechanics, 12e Abridged Print Companion with Wiley E-Text Reg Card Set - Donald F. Elger 2019-04-15

Engineering Fluid Mechanics guides students from theory to application, emphasizing critical thinking, problem solving, estimation, and other vital engineering skills. Clear, accessible writing puts the focus on essential concepts, while abundant illustrations, charts, diagrams, and examples illustrate complex topics and highlight the physical reality of fluid dynamics applications. Over 1,000 chapter problems provide the "deliberate practice"—with feedback—that leads to material mastery, and discussion of real-world applications provides a frame of reference that enhances student comprehension. The study of fluid mechanics pulls from chemistry, physics, statics, and calculus to describe the behavior of liquid matter; as a strong foundation in these concepts is essential across a variety of engineering fields, this text likewise pulls from civil engineering, mechanical engineering, chemical engineering, and more to provide a broadly relevant, immediately practicable knowledge base. Written by a team of educators who are also practicing engineers, this book merges effective pedagogy with professional perspective to help today's students become tomorrow's skillful engineers.

Nanoscience - Hans-Eckhardt Schaefer 2010-08-26

Nanoscience stands out for its interdisciplinarity. Barriers between disciplines disappear and the fields tend to converge at the very smallest scale, where basic principles and tools are universal. Novel properties are inherent to nanosized systems due to quantum effects and a reduction in dimensionality: nanoscience is likely to continue to revolutionize many areas of human activity, such as materials science, nanoelectronics, information processing, biotechnology and medicine. This textbook spans all fields of nanoscience, covering its basics and broad applications. After an introduction to the physical and chemical principles of nanoscience, coverage moves on to the adjacent fields of microscopy, nanoanalysis, synthesis, nanocrystals, nanowires, nanolayers, carbon nanostructures, bulk nanomaterials, nanomechanics, nanophotonics, nanofluidics, nanomagnetism, nanotechnology for computers, nanochemistry, nanobiology, and nanomedicine. Consequently, this broad yet unified coverage addresses research in academia and industry across the natural sciences. Didactically structured and replete with hundreds of illustrations, the textbook is aimed primarily at graduate and advanced-undergraduate students of natural sciences and medicine, and their lecturers.

Green Engineering - David T. Allen 2001-09-06

A chemical engineer's guide to managing and minimizing environmental impact. Chemical processes are invaluable to modern society, yet they generate substantial quantities of wastes and emissions, and safely managing these wastes costs tens of millions of dollars annually. Green Engineering is a complete

professional's guide to the cost-effective design, commercialization, and use of chemical processes in ways that minimize pollution at the source, and reduce impact on health and the environment. This book also offers powerful new insights into environmental risk-based considerations in design of processes and products. First conceived by the staff of the U.S. Environmental Protection Agency, Green Engineering draws on contributions from many leaders in the field and introduces advanced risk-based techniques including some currently in use at the EPA. Coverage includes: Engineering chemical processes, products, and systems to reduce environmental impacts Approaches for evaluating emissions and hazards of chemicals and processes Defining effective environmental performance targets Advanced approaches and tools for evaluating environmental fate Early-stage design and development techniques that minimize costs and environmental impacts In-depth coverage of unit operation and flowsheet analysis The economics of environmental improvement projects Integration of chemical processes with other material processing operations Lifecycle assessments: beyond the boundaries of the plant Increasingly, chemical engineers are faced with the challenge of integrating environmental objectives into design decisions. Green Engineering gives them the technical tools they need to do so.

General Chemistry for Engineers - Jeffrey Gaffney 2017-11-13

General Chemistry for Engineers explores the key areas of chemistry needed for engineers. This book develops material from the basics to more advanced areas in a systematic fashion. As the material is presented, case studies relevant to engineering are included that demonstrate the strong link between chemistry and the various areas of engineering. Serves as a unique chemistry reference source for professional engineers Provides the chemistry principles required by various engineering disciplines Begins with an 'atoms first' approach, building from the simple to the more complex chemical concepts Includes engineering case studies connecting chemical principles to solving actual engineering problems Links chemistry to contemporary issues related to the interface between chemistry and engineering practices

Applied Chemistry and Chemical Engineering, Volume 1 - A. K. Haghi 2017-12-22

This new book brings together innovative research, new concepts, and novel developments in the application of informatics tools for applied chemistry and computer science. It presents a modern approach to modeling and calculation and also looks at experimental design in applied chemistry and chemical engineering. The volume discusses the developments of advanced chemical products and respective tools to characterize and predict the chemical material properties and behavior. Providing numerous comparisons of different methods with one another and with different experiments, not only does this book summarize

the classical theories, but it also exhibits their engineering applications in response to the current key issues. Recent trends in several areas of chemistry and chemical engineering science, which have important application to practice, are discussed. Applied Chemistry and Chemical Engineering: Volume 1: Mathematical and Analytical Techniques provides valuable information for chemical engineers and researchers as well as for graduate students. It demonstrates the progress and promise for developing chemical materials that seem capable of moving this field from laboratory-scale prototypes to actual industrial applications. Volume 2 will focus principles and methodologies in applied chemistry and chemical engineering.

Industrial and Engineering Chemistry - 1923

Green Chemistry and Engineering - Anne E. Marteel-Parrish 2013-10-10

Although many were skeptical of the green chemistry movement at first, it has become a multimillion-dollar business. In preventing the creation of hazardous wastes, laboratories and corporations can save millions in clean up efforts and related health costs. This book supplies students with concepts commonly taught in undergraduate general chemistry and general engineering courses, but with a green perspective. It is unique in presenting an integrated discussion of green chemistry and engineering from first principles - not as an afterthought. Real-world examples show creative problem solving based on the latest issues.

Textbook of Engineering Chemistry, 4th Edition - R. Gopalan, D. Venkappayya & Sulochana Nagarajan

Due to its simple language, straightforward approach to explaining concepts, and the right kind of examples, this book has established itself as student's companion in almost all leading universities in India. With its authentic text and a large number of questions taken from various university examinations, coupled with regular revisions, the book has served well for more than 20 years now. In the attempt to keep the book aligned with various syllabuses and to reach out to students of more and more universities, more details have been included for the fourth edition, which has been completely recast and reformatted. The book is meant for the first year engineering degree courses of Indian universities. STRENGTH OF THE BOOK • Numerous solved problems • Large number of questions from various universities for exhaustive practice • Boxes featuring important and popular aspects of the topic NEW IN THE FOURTH EDITION • Completely recast and reformatted text • New topics like: Cooling curves for one- and two-component eutectics; Electrode polarization and overvoltage; Decomposition potential; Solar cells; Pitting corrosion; Metallurgy and medicine; Reverse osmosis; Bioengineering.