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MARITZA EMMALEE

Chemical Kinetics Springer Science & Business Media This text teaches the principles underlying modern chemical kinetics in a clear, direct fashion, using several examples to enhance basic understanding. It features solutions to selected problems, with separate sections and appendices that cover more technical applications. Each chapter is self-contained and

features an introduction that identifies its basic goals, their significance, and a general plan for their achievement. This text's important aims are to demonstrate that the basic kinetic principles are essential to the solution of modern chemical problems, and to show how the underlying question — "How do chemical reactions occur?" — leads to exciting, vibrant fields of modern research. The first aim is achieved by using relevant examples in presenting the basic material, and the second is attained by inclusion of chapters on surface processes, photochemistry, and reaction dynamics.

Physical and Chemical Processes in Gas Dynamics: Physical and chemical kinetics and thermodynamics World Scientific Publishing Company

Nuclear Reactor Kinetics and Control highlights the application of classical control methods in the frequency space to the dynamic processes of a nuclear reactor. This book contains nine chapters and begins with an introduction to some important mathematical theories related to nuclear engineering, such as the Laplace and Fourier transforms, linear system stability, and the probability theory. The succeeding chapters deal with the frequency space of classical linear design. A chapter describes a stochastic model for the “lumped reactor and presents equations that measure the departure from the mean, as well as representative

experiments or applications of the theory to neutron detection. The discussion then shifts to the aspects of reliability and its consequences for safety of nuclear reactors and some techniques for nonlinear studies centered on the use of the state space and its equations in the time domain. The final chapter introduces the modern electric analogue computer and derives the patching or programming rules that can be use to find solutions to problems of interest using the analogous behavior of electric circuits. This chapter also provide examples of intrinsic interest in nuclear engineering showing the programming involved and typical results, including the slower transients of xenon poisoning and fuel burn-up. This book is intended for nuclear engineers, physicists, applied mathematicians, and nuclear engineering undergraduate and postgraduate students. A Short Course Academic Press

Mechanical kinetics constitutes one of the basic subjects for Metallurgical Engineering. This well-written book presents the subject of kinetics of metallurgical processes in a compressive fashion. Organized into 14 chapters, the book begins with an introduction of the broad basic concepts. It then discusses the kinetics of homogeneous and heterogeneous chemical reactions with some real-life examples from the metallurgical field. The book adequately

covers the concepts of diffusion, convective mass transfer and mixing in fluids, as well as mass transfer in fluids adjacent to a solid surface. Several important processes in metallurgical and materials engineering involve reactions of porous solids with gases. The book discusses this with the help of two important reactions, namely, reduction of iron ores and gasification of carbon. It also deals with mass transfer among two fields and presents the kinetics of electrochemical reactions and phase transformation in a simple manner. The book also contains plenty of numerical worked-out examples and problems, some of which involve computer programs. The Appendix gives some important data useful for solving problems in kinetics. The book is designed for one-semester course for undergraduate students of metallurgical discipline.

Problems in Chemical Kinetics Walter de Gruyter GmbH & Co KG

Winner of 2018 PROSE Award for MULTIVOLUME REFERENCE/SCIENCE This encyclopedia offers a comprehensive and easy reference to physical organic chemistry (POC) methodology and techniques. It puts POC, a classical and fundamental discipline of chemistry, into the context of modern and dynamic fields like biochemical processes, materials science, and molecular electronics. Covers basic terms and theories into organic reactions and mechanisms, molecular designs and syntheses,

tools and experimental techniques, and applications and future directions Includes coverage of green chemistry and polymerization reactions Reviews different strategies for molecular design and synthesis of functional molecules Discusses computational methods, software packages, and more than 34 kinds of spectroscopies and techniques for studying structures and mechanisms Explores applications in areas from biology to materials science The Encyclopedia of Physical Organic Chemistry has won the 2018 PROSE Award for MULTIVOLUME REFERENCE/SCIENCE. The PROSE Awards recognize the best books, journals and digital content produced by professional and scholarly publishers. Submissions are reviewed by a panel of 18 judges that includes editors, academics, publishers and research librarians who evaluate each work for its contribution to professional and scholarly publishing. You can find out more at: proseawards.com Also available as an online edition for your library, for more details visit Wiley Online Library

Chemical kinetics CRC Press

Chemical Kinetics The Study of Reaction Rates in Solution Kenneth A. Connors This chemical kinetics book blends physical theory, phenomenology and empiricism to provide a guide to the experimental practice and interpretation of reaction kinetics in solution. It is

suitable for courses in chemical kinetics at the graduate and advanced undergraduate levels. This book will appeal to students in physical organic chemistry, physical inorganic chemistry, biophysical chemistry, biochemistry, pharmaceutical chemistry and water chemistry all fields concerned with the rates of chemical reactions in the solution phase.

Supercomputer Algorithms for Reactivity, Dynamics and Kinetics of Small Molecules Springer Science & Business Media This text presents a concise and thorough introduction to the main concepts and practical applications of thermodynamics and kinetics in materials science. It is designed with two types of uses in mind: firstly for a one or two semester university course for mid- to upper-level undergraduate or first year graduate students in a materials-science-oriented discipline and secondly for individuals who want to study the material on their own. The following major topics are discussed: basic laws of classical and irreversible thermodynamics, phase equilibria, theory of solutions, chemical reaction thermodynamics and kinetics, surface phenomena, stressed systems, diffusion and statistical thermodynamics. A large number of example problems with detailed solutions are included as well as accompanying computer-based self-tests, consisting of over

400 questions and 2000 answers with hints for students. Computer-based laboratories are provided, in which a laboratory problem is posed and the experiment described. The student can "perform" the experiments and change the laboratory conditions to obtain the data required for meeting the laboratory objective. Each "laboratory" is augmented with background material to aid analysis of the experimental results.

Qualitative Methods of Physical Kinetics and Hydrodynamics OUP Oxford

A practical approach to chemical reaction kinetics—from basic concepts to laboratory methods—featuring numerous real-world examples and case studies This book focuses on fundamental aspects of reaction kinetics with an emphasis on mathematical methods for analyzing experimental data and interpreting results. It describes basic concepts of reaction kinetics, parameters for measuring the progress of chemical reactions, variables that affect reaction rates, and ideal reactor performance. Mathematical methods for determining reaction kinetic parameters are described in detail with the help of real-world examples and fully-worked step-by-step solutions. Both analytical and numerical solutions are exemplified. The book begins with an introduction to the basic concepts of stoichiometry, thermodynamics, and chemical kinetics. This is followed by chapters

featuring in-depth discussions of reaction kinetics; methods for studying irreversible reactions with one, two and three components; reversible reactions; and complex reactions. In the concluding chapters the author addresses reaction mechanisms, enzymatic reactions, data reconciliation, parameters, and examples of industrial reaction kinetics. Throughout the book industrial case studies are presented with step-by-step solutions, and further problems are provided at the end of each chapter. Takes a practical approach to chemical reaction kinetics basic concepts and methods Features numerous illustrative case studies based on the author's extensive experience in the industry Provides essential information for chemical and process engineers, catalysis researchers, and professionals involved in developing kinetic models Functions as a student textbook on the basic principles of chemical kinetics for homogeneous catalysis Describes mathematical methods to determine reaction kinetic parameters with the help of industrial case studies, examples, and step-by-step solutions Chemical Reaction Kinetics is a valuable working resource for academic researchers, scientists, engineers, and catalyst manufacturers interested in kinetic modeling, parameter estimation, catalyst evaluation, process development, reactor modeling, and process simulation. It is also an

ideal textbook for undergraduate and graduate-level courses in chemical kinetics, homogeneous catalysis, chemical reaction engineering, and petrochemical engineering, biotechnology.
Kinetics of Metal Ion Adsorption from Aqueous Solutions Elsevier
This book began as a program of self-education. While teaching under graduate physical chemistry, I became progressively more dissatisfied with my approach to chemical kinetics. The solution to my problem was to write a detailed set of lecture notes which covered more material, in greater depth, than could be presented in undergraduate physical chemistry. These notes are the foundation upon which this book is built. My background led me to view chemical kinetics as closely related to transport phenomena. While the relationship of these topics is well known, it is often ignored, except for brief discussions of irreversible thermody namics. In fact, the physics underlying such apparently dissimilar processes as reaction and energy transfer is not so very different. The intermolecular potential is to transport what the potential-energy surface is to reactivity. Instead of beginning the sections devoted to chemical kinetics with a discussion of various theories, I have chosen to treat phenomenology and mechanism first. In this way the essential unity of kinetic arguments, whether applied to gas-

phase or solution-phase reaction, can be emphasized. Theories of rate constants and of chemical dynamics are treated last, so that their strengths and weaknesses may be more clearly highlighted. The book is designed for students in their senior year or first year of graduate school. A year of undergraduate physical chemistry is essential preparation. While further exposure to chemical thermodynamics, statistical thermodynamics, or molecular spectroscopy is an asset, it is not necessary.

LSENS, a General Chemical Kinetics and Sensitivity Analysis Code for Gas-phase Reactions: User's Guide CRC Press

This book includes problems based on the material in the course of physical kinetics for the students of general and applied physics. It contains 60 problems with detailed solutions. The comments to the problems reflect the connection with the problems and methods of modern physical kinetics. A brief introduction gives the necessary information for solving and understanding the problems. The book is proposed for students and postgraduates studying the theoretical physics. The book is used as a supplement to the textbooks published on physical kinetics. The purpose of the book is to help students in training the practical skills and mastering the basic elements of physical kinetics. To understand the subject matter, it is

sufficient to know the traditional courses of theoretical physics.
Problems in Metallurgical Thermodynamics and Kinetics Problems and Solutions to Chemical Kinetics and Reaction DynamicsKinetics of Metal Ion Adsorption from Aqueous SolutionsModels, Algorithms, and Applications
This monograph is intended to provide a systematic presentation of theories concerning the adsorption of metal ions from aqueous solutions onto surfaces of natural and synthetic substances and to outline methods and procedures to estimate the extent and progress ofadsorption. As heavy metals and the problems associated with their transport and distribution are of serious concern to human health and the environment, the materials presented in this volume have both theoretical and practical significance. In writing this monograph, one ofour goals was to prepare a book useful to environmental workers and practicing engineers. For this reason, our presentation relies heavily on concepts commonly used in the environmental engineering literature. In fact, the volume was prepared for readers with a basic understanding of environmental engineering principles and some knowledge of adsorption processes. No prior familiarity with the ionic solute adsorption at solid-solution interfaces is assumed. Instead, introduction of the necessary background information was included. Generally speaking, metal

ion adsorption may be studied in terms of three distinct but interrelated phenomena: surface ionization, complex formation, and the formation and presence of an electrostatic double layer adjacent to adsorbent surfaces. Analyses of these phenomena with various degrees of sophistication are xviii ADSORPTION OF METAL IONS FROM AQUEOUS SOLUTIONS presented, and their various combinations yield different models that describe metal ion adsorption.

Materials Kinetics

Springer

"A pedagogical gem.... Professor Readey replaces ‘black-box’ explanations with detailed, insightful derivations. A wealth of practical application examples and exercise problems complement the exhaustive coverage of kinetics for all material classes." –Prof. Rainer Hebert, University of Connecticut "Prof. Readey gives a grand tour of the kinetics of materials suitable for experimentalists and modellers.... In an easy-to-read and entertaining style, this book leads the reader to fundamental, model-based understanding of kinetic processes critical to development, fabrication and application of commercially-important soft (polymers, biomaterials), hard (ceramics, metals) and composite materials. It is a must-have for anyone who really wants to understand how to make materials and how they will behave in service." -- Prof. Bill Lee, Imperial

College London, Fellow of the Royal Academy of Engineering "A much needed text filing the gap between an introductory course in materials science and advanced materials-specific kinetics courses. Ideal for the undergraduate interested in an in-depth study of kinetics in materials." –Prof. Mark E. Eberhart, Colorado School of Mines This book provides an in-depth introduction to the most important kinetic concepts in materials science, engineering, and processing. All types of materials are addressed, including metals, ceramics, polymers, electronic materials, biomaterials, and composites. The expert author with decades of teaching and practical experience gives a lively and accessible overview, explaining the principles that determine how long it takes to change material properties and make new and better materials. The chapters cover a broad range of topics extending from the heat treatment of steels, the processing of silicon integrated microchips, and the production of cement, to the movement of drugs through the human body. The author explicitly avoids "black box" equations, providing derivations with clear explanations.

Transport and Rate Phenomena Springer Science & Business Media The field of electrochemical measurement, with respect to thermodynamics, kinetics and analysis, is widely recognised but the subject can be

unpredictable to the novice, even if they have a strong physical and chemical background, especially if they wish to pursue quantitative measurements. Accordingly, some significant experiments are, perhaps wisely, never attempted, while the literature is sadly replete with flawed attempts at rigorous voltammetry.This book presents problems and worked solutions for a wide range of theoretical and experimental subjects in the field of voltammetry. The reader is assumed to have knowledge up to a Master's level of physical chemistry, but no exposure to electrochemistry in general, or voltammetry in particular, is required. The problems included range in difficulty from senior undergraduate to research level, and develop important practical approaches in voltammetry.The problems presented in the earlier chapters focus on the fundamental theories of thermodynamics, electron transfer and diffusion. Voltammetric experiments and their analysis are then considered, including extensive problems on both macroelectrode and microelectrode voltammetry. Convection, hydrodynamic electrodes, homogeneous kinetics, adsorption and electroanalytical applications are discussed in the later chapters, as well as problems on two rapidly developing fields of voltammetry: weakly supported media and nanoscale electrodes.There is huge

interest in the experimental procedure of voltammetry at present, and yet no dedicated question and answer book with exclusive voltammetric focus exists, in spite of the inherent challenges of the subject. This book aims to fill that niche.
Classical and Quantum Problems and Solutions PHI Learning Pvt. Ltd.
Market: Graduate students and researchers in physical kinetics, hydrodynamics, and plasma and solid state physics. Vladimir Krainov has produced one of the few books in the field to concentrate on qualitative methods. He presents order of magnitude solutions for physical quantities in various nonequilibrium statistical processes as well as qualitative solutions of differential equations for macroscopic nonequilibrium processes in gases and other media. Covers topics including free convection, turbulence phenomena, sound propagation, and surface phenomena.
International Series on Materials Science and Technology Elsevier
Problems and Solutions to Chemical Kinetics and Reaction DynamicsKinetics of Metal Ion Adsorption from Aqueous SolutionsModels, Algorithms, and ApplicationsSpringer Science & Business Media
Chemical Kinetics and Reaction Dynamics Springer Science & Business Media
This monograph discusses the essential principles of the evaporationprocess by looking at it at the molecular and atomic

level. In the first part methods of statistical physics, physical kinetics andnumerical modeling are outlined including the Maxwell’s distributionfunction, the Boltzmann kinetic equation, the Vlasov approach, and theCUDA technique. The distribution functions of evaporating particles are then defined.Experimental results on the evaporation coefficient and the temperaturejump on the evaporation surface are critically reviewed and compared tothe theory and numerical results presented in previous chapters. The book ends with a chapter devoted to evaporation in differentprocesses, such as boiling and cavitation.This monograph addressesgraduate students and researchers working on phase transitions andrelated fields.

1975: January-June: Index

CRC Press

The volume is devoted to the problem of chemical kinetics on modern level. The book includes information on chemical physics of nanocomposites, degradation, stabilization and flammability of polymeric materials as well as free radical mechanism of oxidation of organic compounds, thermostability, mechanism of action of catalytical systems and inhibitors in free radical reactions in liquid and solid phase, pure and applied chemistry of antioxidants (synthesis and application), ionic reactions, effect of chemoluminescence in

the processes of oxidation, biodegradation and application of polymers in medicine, problems of adhesion of microorganisms on the surface of materials, thermo-, photo- and hydrolitic reactions, creation of new ecologically friendly flame retaradnts for polymers, polymer composites and polymer blends as well as filled polymers.

Concepts, Methods and Case Studies Elsevier

James House's revised Principles of Chemical Kinetics provides a clear and logical description of chemical kinetics in a manner unlike any other book of its kind. Clearly written with detailed derivations, the text allows students to move rapidly from theoretical concepts of rates of reaction to concrete applications. Unlike other texts, House presents a balanced treatment of kinetic reactions in gas, solution, and solid states. The entire text has been revised and includes many new sections and an additional chapter on applications of kinetics. The topics covered include quantitative relationships between molecular structure and chemical activity, organic/inorganic chemistry, biochemical kinetics, surface kinetics and reaction mechanisms. Chapters also include new problems, with answers to selected questions, to test the reader's understanding of each area. A solutions manual with answers to all questions is available for instructors. A useful text for both students and interested readers alike,

Dr. House has once again written a comprehensive text simply explaining an otherwise complicated subject. Provides an introduction to all the major areas of kinetics and demonstrates the use of these concepts in real life applications Detailed derivations of formula are shown to help students with a limited background in mathematics Presents a balanced treatment of kinetics of reactions in gas phase, solutions and solids Solutions manual available for instructors

Kinetics of Evaporation

Elsevier

By bringing together various ideas and methods for extracting the slow manifolds, the authors show that it is possible to establish a more macroscopic description in nonequilibrium systems. The book treats slowness as stability. A unifying geometrical viewpoint of the thermodynamics of slow and fast motion enables the development of reduction techniques, both analytical and numerical. Examples considered in the book range from the Boltzmann kinetic equation and hydrodynamics to the Fokker-Planck equations of polymer dynamics and models of chemical kinetics describing oxidation reactions. Special chapters are devoted to model reduction in classical statistical dynamics, natural selection, and exact solutions for slow hydrodynamic manifolds. The book will be a major reference source for both theoretical and applied model reduction. Intended primarily as a

postgraduate-level text in nonequilibrium kinetics and model reduction, it will also be valuable to PhD students and researchers in applied mathematics, physics and various fields of engineering.
The Application of Metabolic and Excretion Kinetics to Problems of Industrial Toxicology AIAA (American Institute of Aeronautics & Astronautics)
Physical Chemistry for the Biosciences has been optimized for a one-semester introductory course in physical chemistry for students of biosciences.
Thermodynamics and Kinetics in Materials Science Springer
This new edition covers contemporary directions of non-equilibrium statistical mechanics as well as classical methods of kinetics.
Supplementary material on the non-equilibrium statistical operator (NSO) method for calculating kinetics coefficients describing spintronics is included in this new addition. This book is an easy-to-read text describing the fundamentals of the field.