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Thermodynamics and Chemistry \ *Chemical Thermodynamics* **Thermochemistry and Thermodynamics** *Advanced Thermodynamics for Engineers* **Practical Chemical Thermodynamics for Geoscientists** *Engineering and Chemical Thermodynamics* Statistical Thermodynamics *Chemical Thermodynamics: Advanced Applications Chemical Thermodynamics of Materials Thermodynamics with Chemical Engineering Applications* Enthalpy and Internal Energy: *Thermodynamic Models for Industrial Applications* Thermodynamics and Kinetics of Drug Binding **Chemical Thermodynamics of Selenium** Energy Research Abstracts **Measurement of the Thermodynamic Properties of Multiple Phases Principles of Thermodynamics** Chemistry Data Book **Atkins' Physical Chemistry 11e** *Chemical Thermodynamics* **Preliminary Report on the Thermodynamic Properties of Selected Light-element and Some Related Compounds** Thermodynamics of Small Systems **Nagra/PSI Chemical Thermodynamic Data Base 01/01 The NBS Tables of Chemical Thermodynamic Properties** Theoretical Chemistry from the Standpoint of Avogadro's Rule & Thermodynamics Thermodynamics of Natural Systems *A Textbook of Physical Chemistry – Volume 1* Chemical Thermodynamics **The Principles of Chemical Equilibrium** Thermodynamic Basis of Crystal Growth *Phase Equilibria in Chemical Engineering Preliminary Report on the Thermodynamic Properties of Selected Light-element and Some Related Compounds* **Measurement of the Thermodynamic Properties of Single Phases Chemical Thermodynamics Federal Grants and Contracts for Unclassified Research in the Physical Sciences** *NBS Monograph* Physical Properties Data for Rock Salt Annual Review of Physical Chemistry Molecular Engineering Thermodynamics *Thermodynamics and Fluctuations far from Equilibrium*

Enthalpy and Internal Energy: Dec 26 2021 Containing the very latest information on all aspects of enthalpy and internal energy as related to fluids, this book brings all the information into one authoritative survey in this well-defined field of chemical thermodynamics. Written by acknowledged experts in their respective fields, each of the 26 chapters covers theory, experimental methods and techniques and results for all types of liquids and vapours. These properties are important in all branches of pure and applied thermodynamics and this vital source is an important contribution to the subject hopefully also providing key pointers for cross-fertilization between sub-areas.

Chemical Thermodynamics Jan 03 2020

Thermodynamics with Chemical Engineering Applications Jan 27 2022 Master the principles of thermodynamics, and understand their practical real-world applications, with this deep and intuitive undergraduate textbook.

The NBS Tables of Chemical Thermodynamic Properties Nov 12 2020

Chemical Thermodynamics Jul 09 2020 This book develops the theory of chemical thermodynamics from first principles, demonstrates its relevance across scientific and engineering disciplines, and shows how thermodynamics can be used as a practical tool for understanding natural phenomena and developing and improving technologies and products. Concepts such as internal energy, enthalpy, entropy, and Gibbs energy are explained using ideas and experiences familiar to students, and realistic examples are given so the usefulness and pervasiveness of thermodynamics becomes apparent. The worked examples illustrate key ideas and demonstrate important types of calculations, and the problems at the end of chapters are designed to reinforce important concepts and show the broad range of applications. Most can be solved using digitized data from open access databases and a spreadsheet. Answers are provided for the numerical problems. A particular theme of the book is the calculation of the equilibrium composition of systems, both reactive and non-reactive, and this includes the principles of Gibbs energy minimization. The overall approach leads to the intelligent use of thermodynamic software packages but, while these are discussed and their use demonstrated, they are not the focus of the book, the aim being to provide the necessary foundations. Another unique aspect is the inclusion of three applications chapters: heat and energy aspects of processing; the thermodynamics of metal production and recycling; and applications of electrochemistry. This book is aimed primarily at students of chemistry, chemical engineering, applied science, materials science, and metallurgy, though it will be also useful for students undertaking courses in geology and environmental science. A solutions manual is available for instructors.

The Principles of Chemical Equilibrium Jun 07 2020 Sample Text

Thermodynamic Basis of Crystal Growth May 07 2020 This book presents a new and promising technique to grow single crystalline compound semiconductor materials with defined stoichometry. The technique is based on the high-precision experimental determination of the boundaries of the single-phase volume of the solid in the pressure-temperature-composition P-T-X phase space. Alongside test results obtained by the author and his colleagues, the P-T-X diagrams of other important materials (e.g., III-V, V-VI semiconductors) are also discussed.

Chemical Thermodynamics Mar 17 2021

Engineering and Chemical Thermodynamics May 31 2022 Chemical engineers face the challenge of learning the difficult concept and application of entropy and the 2nd Law of Thermodynamics. By following a visual approach and offering qualitative discussions of the role of molecular interactions, Koretsky helps them understand and visualize thermodynamics. Highlighted examples show how the material is applied in the real world. Expanded coverage includes biological content and examples, the Equation of State approach for both liquid and vapor phases in VLE, and the practical side of the 2nd Law. Engineers will then be able to use this resource as the basis for more advanced concepts.

Thermodynamics and Kinetics of Drug Binding Oct 24 2021 This practical reference for medicinal and pharmaceutical chemists combines the theoretical background with modern methods as well as applications from recent lead finding and optimization projects. Divided into two parts on the thermodynamics and kinetics of drug-receptor interaction, the text provides the conceptual and methodological basis for characterizing binding mechanisms for drugs and other bioactive molecules. It covers all currently used methods, from experimental approaches, such as ITC or SPR, right up to the latest computational methods. Case studies of real-life lead or drug development projects are also included so readers can apply the methods learned to their own projects. Finally, the benefits of a thorough binding mode analysis for any drug

development project are summarized in an outlook chapter written by the editors.

Measurement of the Thermodynamic Properties of Multiple Phases Jul 21 2021 1. Introduction. -- 2. Phase Changes in Pure Component Systems: Liquids and Gases. -- 3. Phase Changes in Pure Component Systems: Liquids and Solids. -- 4. Phase Changes in Pure Component Systems: Solid and Solid. -- 5. Vapour-Liquid Equilibrium at Low Pressure. -- 6. Vapour-Liquid Equilibrium at High Pressure. -- 7. Low Pressure Gas Solubility in Liquids. -- 8. Liquid-Liquid Equilibrium. -- 9. Condensed Phases of Organic Materials: Solid-Liquid and Solid-Solid Equilibrium. -- 10. Condensed Phases of Inorganic Materials: Metallic Systems. -- 11. Condensed Phases of Inorganic Materials: Ceramic Systems. -- 12. Condensed Phases of Inorganic Materials: Molten Salts. -- 13. Measurement of Limiting Activity Coefficients Using Non-Analytical Tools. -- 14. Measurement of Limiting Activity Coefficients Using Analytical Tools. -- 15. Measurement of Interfacial Tension. -- 16. Critical Parameters.

Statistical Thermodynamics Apr 29 2022 This self-contained primer covers statistical thermodynamics in a rigorous yet approachable manner, making it the perfect text for undergraduates.

Preliminary Report on the Thermodynamic Properties of Selected Light-element and Some Related Compounds Feb 13 2021

Chemical Thermodynamics of Materials Feb 25 2022 A comprehensive introduction, examining both macroscopic and microscopic aspects of the subject, the book applies the theory of thermodynamics to a broad range of materials; from metals, ceramics and other inorganic materials to geological materials. Focusing on materials rather than the underlying mathematical concepts of the subject, this book will be ideal for the non-specialist requiring an introduction to the energetics and stability of materials. Macroscopic thermodynamic properties are linked to the underlying miscroscopic nature of the materials and trends in important properties are discussed. A unique approach covering both macroscopic and microscopic aspects of the subject Authors have worldwide reputations in this area Fills a gap in the market by featuring a wide range of real up-to-date examples and covering a large amount of materials

Energy Research Abstracts Aug 22 2021

Federal Grants and Contracts for Unclassified Research in the Physical Sciences Dec 02 2019

Preliminary Report on the Thermodynamic Properties of Selected Light-element and Some Related Compounds Mar 05 2020

Annual Review of Physical Chemistry Aug 29 2019

Principles of Thermodynamics Jun 19 2021 An introductory textbook presenting the key concepts and applications of thermodynamics, including numerous worked examples and exercises.

Thermodynamics and Chemistry \ Nov 05 2022

Nagra/PSI Chemical Thermodynamic Data Base 01/01 Dec 14 2020 The Nagra/PSI Chemical Thermodynamic Data Base 01/01 is an encyclopedia of thermodynamic data recommended for environmental studies. The data base focuses on elements commonly found as major solutes in natural waters, and on actinides and fission products relevant for radioactive waste disposal projects. It is the official chemical thermodynamic data base used in Swiss radioactive waste disposal projects. The detailed discussion of every number recommended in this encyclopedia is the result of a multi man-year project of the Paul Scherrer Institut (PSI), a Swiss National Lab. The five authors of this work have many years of experience in research, data base development and the application of thermodynamic data in environmental studies. The data included for many elements are based on their reviews of the basic literature. The data base also includes additional data selected by the authors from recommendations of other experts in ground- water geochemistry and of the international data base project of the Nuclear Energy Agency (NEA).This report is indispensable for every scientist working in the field of environmental studies as the comprehensive source of information on the quality of the thermodynamic data governing particular problems in environmental geochemistry, especially those concerned with the fate of hazardous substances. This enables graduate students, researchers and consultants, as well as regulators and reviewers of scientific papers to assess the scientific basis of environmental modeling studies. The encyclopedia can be used as a stand-alone source of knowledge but amplereferences are provided for readers who wish to go beyond the level of discussion in the book. An electronic version of the data base and a data base management program is available for download at our homepage (http://les.web.psi.ch/TDBbook.htm).

Measurement of the Thermodynamic Properties of Single Phases Feb 02 2020 This title is a revision of Experimental Thermodynamics Volume II, published in 1975, reflecting the significant technological developments and new methods introduced into the study of measurement of thermodynamic quantities. The editors of this volume were assigned the task of assembling an international team of distinguished experimentalists, to describe the current state of development of the techniques of measurement of the thermodynamic quantities of single phases. The resulting volume admirably fulfils this brief and contains a valuable summary of a large variety of experimental techniques applicable over a wide range of thermodynamic states with an emphasis on the precision and accuracy of the results obtained. Those interested in the art of measurements, and in particular engaged in the measurement of thermodynamic properties, will find this material invaluable for the guidance it provides towards the development of new and more accurate techniques. · Provides detailed descriptions of experimental chemical thermodynamic methods · Strong practical bias and includes both detailed working equations and figures for the experimental methods · Most comprehensive text in this field since the publication of Experimental Thermodynamics II

Thermodynamics and Fluctuations far from Equilibrium Jun 27 2019 This book deals with the formulation of the thermodynamics of chemical and other systems far from equilibrium. It contains applications to non-equilibrium stationary states and approaches to such states, systems with multiple stationary states, stability and equi-stability conditions, reaction diffusion systems, transport properties, and electrochemical systems. The theoretical treatment is complemented by experimental results to substantiate the formulation.

Molecular Engineering Thermodynamics Jul 29 2019 Building up gradually from first principles, this unique introduction to modern thermodynamics integrates classical, statistical and molecular approaches and is especially designed to support students studying chemical and biochemical engineering. In addition to covering traditional problems in engineering thermodynamics in the context of biology and materials chemistry, students are also introduced to the thermodynamics of DNA, proteins, polymers and surfaces. It includes over 80 detailed worked examples, covering a broad range of scenarios such as fuel cell efficiency, DNA/protein binding, semiconductor manufacturing and polymer foaming, emphasizing the practical real-world applications of thermodynamic principles; more than 300 carefully tailored homework problems, designed to stretch and extend students' understanding of key topics, accompanied by an online solution manual for instructors; and all the necessary mathematical background, plus resources summarizing commonly used symbols, useful equations of state, microscopic balances for open systems, and links to useful online tools and datasets.

Theoretical Chemistry from the Standpoint of Avogadro's Rule & Thermodynamics Oct 12 2020

Thermodynamic Models for Industrial Applications Nov 24 2021 Using an applications perspective Thermodynamic Models for Industrial Applications provides a unified framework for the development of various thermodynamic models, ranging from the classical models to some of the most advanced ones. Among these are the Cubic Plus Association Equation of State (CPA EoS) and the Perturbed Chain Statistical

Association Fluid Theory (PC-SAFT). These two advanced models are already in widespread use in industry and academia, especially within the oil and gas, chemical and polymer industries. Presenting both classical models such as the Cubic Equations of State and more advanced models such as the CPA, this book provides the critical starting point for choosing the most appropriate calculation method for accurate process simulations. Written by two of the developers of these models, Thermodynamic Models for Industrial Applications emphasizes model selection and model development and includes a useful “which model for which application” guide. It also covers industrial requirements as well as discusses the challenges of thermodynamics in the 21st Century.

Thermochemistry and Thermodynamics Sep 03 2022

Physical Properties Data for Rock Salt Sep 30 2019

Thermodynamics of Small Systems Jan 15 2021 Authoritative summary introduces basics, explores environmental variables, examines binding on macromolecules and aggregation, and includes brief summaries of electric and magnetic fields, spherical drops and bubbles, and polydisperse systems. 1963 and 1964 editions.

Thermodynamics of Natural Systems Sep 10 2020 Fully updated, this streamlined new textbook is an accessible introduction to thermodynamics for Earth and environmental scientists, emphasising real-world problems.

Phase Equilibria in Chemical Engineering Apr 05 2020 Phase Equilibria in Chemical Engineering is devoted to the thermodynamic basis and practical aspects of the calculation of equilibrium conditions of multiple phases that are pertinent to chemical engineering processes. Efforts have been made throughout the book to provide guidance to adequate theory and practice. The book begins with a long chapter on equations of state, since it is intimately bound up with the development of thermodynamics. Following material on basic thermodynamics and nonidealities in terms of fugacities and activities, individual chapters are devoted to equilibria primarily between pairs of phases. A few topics that do not fit into these categories and for which the state of the art is not yet developed quantitatively have been relegated to a separate chapter. The chapter on chemical equilibria is pertinent since many processes involve simultaneous chemical and phase equilibria. Also included are chapters on the evaluation of enthalpy and entropy changes of nonideal substances and mixtures, and on experimental methods. This book is intended as a reference and self-study as well as a textbook either for full courses in phase equilibria or as a supplement to related courses in the chemical engineering curriculum. Practicing engineers concerned with separation technology and process design also may find the book useful.

Chemistry Data Book May 19 2021 This text is a standard reference book for A Level and equivalent examinations.

Chemical Thermodynamics of Selenium Sep 22 2021 In order to quantitatively predict the chemical reactions that hazardous materials may undergo in the environment, it is necessary to know the relative stabilities of the compounds and complexes that may be found under certain conditions. This type of calculations may be done using consistent chemical thermodynamic data, such as those contained in this book for inorganic compounds and complexes of selenium. * Fully detailed authoritative critical review of literature. * Integrated into a comprehensive and consistent database for waste management applications. * CD ROM version.

NBS Monograph Oct 31 2019

Advanced Thermodynamics for Engineers Aug 02 2022 Although the basic theories of thermodynamics are adequately covered by a number of existing texts, there is little literature that addresses more advanced topics. In this comprehensive work the author redresses this balance, drawing on his twenty-five years of experience of teaching thermodynamics at undergraduate and postgraduate level, to produce a definitive text to cover thoroughly, advanced syllabuses. The book introduces the basic concepts which apply over the whole range of new technologies, considering: a new approach to cycles, enabling their irreversibility to be taken into account; a detailed study of combustion to show how the chemical energy in a fuel is converted into thermal energy and emissions; an analysis of fuel cells to give an understanding of the direct conversion of chemical energy to electrical power; a detailed study of property relationships to enable more sophisticated analyses to be made of both high and low temperature plant and irreversible thermodynamics, whose principles might hold a key to new ways of efficiently covering energy to power (e.g. solar energy, fuel cells). Worked examples are included in most of the chapters, followed by exercises with solutions. By developing thermodynamics from an explicitly equilibrium perspective, showing how all systems attempt to reach a state of equilibrium, and the effects of these systems when they cannot, the result is an unparalleled insight into the more advanced considerations when converting any form of energy into power, that will prove invaluable to students and professional engineers of all disciplines.

A Textbook of Physical Chemistry – Volume 1 Aug 10 2020 An advanced-level textbook of physical chemistry for the graduate (B.Sc) and postgraduate (M.Sc) students of Indian and foreign universities. This book is a part of four volume series, entitled "A Textbook of Physical Chemistry – Volume I, II, III, IV". CONTENTS: Chapter 1. Quantum Mechanics – I: Postulates of quantum mechanics; Derivation of Schrodinger wave equation; Max-Born interpretation of wave functions; The Heisenberg’s uncertainty principle; Quantum mechanical operators and their commutation relations; Hermitian operators (elementary ideas, quantum mechanical operator for linear momentum, angular momentum and energy as Hermition operator); The average value of the square of Hermitian operators; Commuting operators and uncertainty principle(x & p; E & t); Schrodinger wave equation for a particle in one dimensional box; Evaluation of average position, average momentum and determination of uncertainty in position and momentum and hence Heisenberg’s uncertainty principle; Pictorial representation of the wave equation of a particle in one dimensional box and its influence on the kinetic energy of the particle in each successive quantum level; Lowest energy of the particle. Chapter 2. Thermodynamics – I: Brief resume of first and second Law of thermodynamics; Entropy changes in reversible and irreversible processes; Variation of entropy with temperature, pressure and volume; Entropy concept as a measure of unavailable energy and criteria for the spontaneity of reaction; Free energy, enthalpy functions and their significance, criteria for spontaneity of a process; Partial molar quantities (free energy, volume, heat concept); Gibb’s-Duhem equation. Chapter 3. Chemical Dynamics – I: Effect of temperature on reaction rates; Rate law for opposing reactions of Ist order and IInd order; Rate law for consecutive & parallel reactions of Ist order reactions; Collision theory of reaction rates and its limitations; Steric factor; Activated complex theory; Ionic reactions: single and double sphere models; Influence of solvent and ionic strength; The comparison of collision and activated complex theory. Chapter 4. Electrochemistry – I: Ion-Ion Interactions: The Debye-Huckel theory of ion- ion interactions; Potential and excess charge density as a function of distance from the central ion; Debye Huckel reciprocal length; Ionic cloud and its contribution to the total potential; Debye - Huckel limiting law of activity coefficients and its limitations; Ion-size effect on potential; Ion-size parameter and the theoretical mean-activity coefficient in the case of ionic clouds with finite-sized ions; Debye - Huckel-Onsager treatment for aqueous solutions and its limitations; Debye-Huckel-Onsager theory for non-aqueous solutions; The solvent effect on the mobality at infinite dilution; Equivalent conductivity (?) vs. concentration c 1/2 as a function of the solvent; Effect of ion association upon conductivity (Debye- Huckel - Bjerrum equation). Chapter 5. Quantum Mechanics – II: Schrodinger wave equation for a particle in a three dimensional box; The concept of degeneracy among energy levels for a particle in three dimensional box; Schrodinger wave equation for a linear harmonic oscillator & its solution by polynomial method; Zero point energy of a particle possessing harmonic motion and its consequence; Schrodinger wave equation for three dimensional Rigid rotator; Energy of rigid rotator; Space quantization; Schrodinger wave equation for hydrogen atom, separation of

variable in polar spherical coordinates and its solution; Principle, azimuthal and magnetic quantum numbers and the magnitude of their values; Probability distribution function; Radial distribution function; Shape of atomic orbitals (s,p & d). Chapter 6. Thermodynamics – II: Classius-Clayperon equation; Law of mass action and its thermodynamic derivation; Third law of thermodynamics (Nernest heat theorem, determination of absolute entropy, unattainability of absolute zero) and its limitation; Phase diagram for two completely miscible components systems; Eutectic systems, Calculation of eutectic point; Systems forming solid compounds Ax By with congruent and incongruent melting points; Phase diagram and thermodynamic treatment of solid solutions. Chapter 7. Chemical Dynamics – II: Chain reactions: hydrogen-bromine reaction, pyrolysis of acetaldehyde, decomposition of ethane; Photochemical reactions (hydrogen - bromine & hydrogen -chlorine reactions); General treatment of chain reactions (ortho-para hydrogen conversion and hydrogen - bromine reactions); Apparent activation energy of chain reactions, Chain length; Rice-Herzfeld mechanism of organic molecules decomposition(acetaldehyde); Branching chain reactions and explosions (H2-O2 reaction); Kinetics of (one intermediate) enzymatic reaction : Michaelis-Menton treatment; Evaluation of Michaelis 's constant for enzyme-substrate binding by Lineweaver-Burk plot and Eadie-Hofstae methods; Competitive and non-competitive inhibition. Chapter 8. Electrochemistry – II: Ion Transport in Solutions: Ionic movement under the influence of an electric field; Mobility of ions; Ionic drift velocity and its relation with current density; Einstein relation between the absolute mobility and diffusion coefficient; The Stokes- Einstein relation; The Nernst -Einstein equation; Walden’s rule; The Rate-process approach to ionic migration; The Rate process equation for equivalent conductivity; Total driving force for ionic transport, Nernst - Planck Flux equation; Ionic drift and diffusion potential; the Onsager phenomenological equations; The basic equation for the diffusion; Planck-Henderson equation for the diffusion potential.

Practical Chemical Thermodynamics for Geoscientists Jul 01 2022 Practical Chemical Thermodynamics for Geoscientists covers classical chemical thermodynamics and focuses on applications to practical problems in the geosciences, environmental sciences, and planetary sciences. This book will provide a strong theoretical foundation for students, while also proving beneficial for earth and planetary scientists seeking a review of thermodynamic principles and their application to a specific problem. Strong theoretical foundation and emphasis on applications Numerous worked examples in each chapter Brief historical summaries and biographies of key thermodynamicists—including their fundamental research and discoveries Extensive references to relevant literature

Chemical Thermodynamics: Advanced Applications Mar 29 2022 This book is an excellent companion to Chemical Thermodynamics: Principles and Applications. Together they make a complete reference set for the practicing scientist. This volume extends the range of topics and applications to ones that are not usually covered in a beginning thermodynamics text. In a sense, the book covers a "middle ground" between the basic principles developed in a beginning thermodynamics textbook, and the very specialized applications that are a part of an ongoing research project. As such, it could prove invaluable to the practicing scientist who needs to apply thermodynamic relationships to aid in the understanding of the chemical process under consideration. The writing style in this volume remains informal, but more technical than in Principles and Applications. It starts with Chapter 11, which summarizes the thermodynamic relationships developed in this earlier volume. For those who want or need more detail, references are given to the sections in Principles and Applications where one could go to learn more about the development, limitations, and conditions where these equations apply. This is the only place where Advanced Applications ties back to the previous volume. Chapter 11 can serve as a review of the fundamental thermodynamic equations that are necessary for the more sophisticated applications described in the remainder of this book. This may be all that is necessary for the practicing scientist who has been away from the field for some time and needs some review. The remainder of this book applies thermodynamics to the description of a variety of problems. The topics covered are those that are probably of the most fundamental and broadest interest. Throughout the book, examples of "real" systems are used as much as possible. This is in contrast to many books where "generic" examples are used almost exclusively. A complete set of references to all sources of data and to supplementary reading sources is included. Problems are given at the end of each chapter. This makes the book ideally suited for use as a textbook in an advanced topics course in chemical thermodynamics. An excellent review of thermodynamic principles and mathematical relationships along with references to the relevant sections in Principles and Applications where these equations are developed Applications of thermodynamics in a wide variety of chemical processes, including phase equilibria, chemical equilibrium, properties of mixtures, and surface chemistry Case-study approach to demonstrate the application of thermodynamics to biochemical, geochemical, and industrial processes Applications at the "cutting edge" of thermodynamics Examples and problems to assist in learning Includes a complete set of references to all literature sources

Chemical Thermodynamics Oct 04 2022 This course-derived undergraduate textbook provides a concise explanation of the key concepts and calculations of chemical thermodynamics. Instead of the usual ‘classical’ introduction, this text adopts a straightforward postulatory approach that introduces thermodynamic potentials such as entropy and energy more directly and transparently. Structured around several features to assist students’ understanding, Chemical Thermodynamics : Develops applications and methods for the ready treatment of equilibria on a sound quantitative basis. Requires minimal background in calculus to understand the text and presents formal derivations to the student in a detailed but understandable way. Offers end-of-chapter problems (and answers) for self-testing and review and reinforcement, of use for self- or group study. This book is suitable as essential reading for courses in a bachelor and master chemistry program and is also valuable as a reference or textbook for students of physics, biochemistry and materials science.

Atkins' Physical Chemistry 11e Apr 17 2021 Atkins' Physical Chemistry: Molecular Thermodynamics and Kinetics is designed for use on the second semester of a quantum-first physical chemistry course. Based on the hugely popular Atkins' Physical Chemistry, this volume approaches molecular thermodynamics with the assumption that students will have studied quantum mechanics in their first semester. The exceptional quality of previous editions has been built upon to make this new edition of Atkins' Physical Chemistry even more closely suited to the needs of both lecturers and students. Re-organised into discrete 'topics', the text is more flexible to teach from and more readable for students. Now in its eleventh edition, the text has been enhanced with additional learning features and maths support to demonstrate the absolute centrality of mathematics to physical chemistry. Increasing the digestibility of the text in this new approach, the reader is brought to a question, then the math is used to show how it can be answered and progress made. The expanded and redistributed maths support also includes new 'Chemist's toolkits' which provide students with succinct reminders of mathematical concepts and techniques right where they need them. Checklists of key concepts at the end of each topic add to the extensive learning support provided throughout the book, to reinforce the main take-home messages in each section. The coupling of the broad coverage of the subject with a structure and use of pedagogy that is even more innovative will ensure Atkins' Physical Chemistry remains the textbook of choice for studying physical chemistry.