

## The World Of Physical Chemistry

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Quanta, Matter, and Change  
Physical Chemistry  
Basic Physical Chemistry  
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### Interfacial Physical Chemistry of High-Temperature Melts

In this essential guide for students of chemistry, Peter Atkins' Very Short Introduction explains the principles and phenomena of physical chemistry. Using few formulas, Atkins shows how physical chemistry draws its ideas from physics, quantum mechanics, and mathematics, and how it has contributed to our understanding of the natural world.

### The World of Physical Chemistry

'Experimental Physical Chemistry' includes complete lists of necessary materials, detailed background material for each experiment, and relevant sections on measurements and error analysis.

### Physical Chemistry for the Biological Sciences

This book provides an introduction to physical chemistry that is directed toward applications to the biological sciences. Advanced mathematics is not required. This book can be used for either a one semester or two semester course, and as a reference volume by students and faculty in the biological sciences.

## **Elements of Physical Chemistry**

Peter Atkins and Julio de Paula offer a fully integrated approach to the study of physical chemistry and biology.

## **Molecular Physical Chemistry**

Molecular Physical Chemistry: A Concise Introduction focuses on two main aspects of physical chemistry: thermodynamics and reaction dynamics. By looking at the properties of the atoms and molecules that constitute matter, it makes use of results from modern experiments conducted on small numbers of molecules. These molecular properties allow the behaviour of larger groups of molecules to be predicted. This is in contrast to conventional approaches which are based upon how the subjects have developed historically. It attempts to show how some basic concepts can be easily applied to give verifiable results in simple systems before extending them to more complicated scenarios. The text is intended as an aid to understanding these central topics of physical chemistry, rather than an introduction to them, and some familiarity with them is assumed throughout. Worked examples and problems are given at the end of each chapter. Molecular Physical Chemistry: A Concise Introduction will be welcomed by graduate and advanced undergraduate students, as well as lecturers. Upon completion of this book the reader will see its subject matter as an integral part of their whole approach to chemistry. "Professor McLaughlin is certainly owed a debt of gratitude by the chemical community for this effort to bring enjoyment and understanding to the future generation. It will be interesting to see if this experiment helps students replace the fear of physical chemistry by an appreciation of its power and beauty." Professor William Klemperer, University of Harvard

## **Magick, Mayhem, and Mavericks**

aspects of the learning process are fully supported, including the understanding of terminology, notation, mathematical concepts, and the application of physical chemistry to other branches of science." "Building on the heritage of the world-renowned Atkins' Physical Chemistry , Quanta, Matter, and Change gives a refreshing new insight into the familiar by illuminating physical chemistry from a new direction." --Book Jacket.

## **A Textbook of Physical Chemistry**

Hailed by advance reviewers as "a kinder, gentler P. Chem. text," this book meets the needs of an introductory course on physical chemistry, and is an ideal choice for courses geared toward pre-medical and life sciences students. Physical Chemistry for the Chemical and Biological Sciences offers a wealth of applications to biological problems, numerous worked

examples and around 1000 chapter-end problems.

## **Chemistry: A Very Short Introduction**

Physical Chemistry of Gas-Liquid Interfaces, the first volume in the Developments in Physical & Theoretical Chemistry series, addresses the physical chemistry of gas transport and reactions across liquid surfaces. Gas-liquid interfaces are all around us, especially within atmospheric systems such as sea spray aerosols, cloud droplets, and the surface of the ocean. Because the reaction environment at liquid surfaces is completely unlike bulk gas or bulk liquid, chemists must readjust their conceptual framework when entering this field. This book provides the necessary background in thermodynamics and computational and experimental techniques for scientists to obtain a thorough understanding of the physical chemistry of liquid surfaces in complex, real-world environments. Provides an interdisciplinary view of the chemical dynamics of liquid surfaces, making the content of specific use to physical chemists and atmospheric scientists Features 100 figures and illustrations to underscore key concepts and aid in retention for young scientists in industry and graduate students in the classroom Helps scientists who are transitioning to this field by offering the appropriate thermodynamic background and surveying the current state of research

## **Concise Physical Chemistry**

The ideal course companion, Elements of Physical Chemistry is written specifically with the needs of undergraduate students in mind, and provides extensive mathematical and pedagogical support while remaining concise and accessible. For the seventh edition of this much-loved text, the material has been reorganized into short Topics, which are grouped into thematic Focuses to make the text more digestible for students, and more flexible for lecturers to teach from. At the beginning of each Topic, three questions are posed, emphasizing why it is important, what the key idea is, and what the student should already know. Throughout the text, equations are clearly labeled and annotated, and detailed 'justification' boxes are provided to help students understand the crucial mathematics which underpins physical chemistry. Furthermore, Chemist's toolkits provide succinct reminders of key mathematical techniques exactly where they are needed in the text. Frequent worked examples, in addition to self-test questions and end-of-chapter exercises, help students to gain confidence and experience in solving problems. This diverse suite of pedagogical features, alongside an appealing design and layout, make Elements of Physical Chemistry the ideal course text for those studying this core branch of chemistry for the first time.

## **A Textbook of Physical Chemistry**

With its easy-to-read approach and focus on core topics, PHYSICAL CHEMISTRY, 2e provides a concise, yet thorough examination of calculus-based physical chemistry. The Second Edition, designed as a learning tool for students who want to learn physical chemistry in a functional and relevant way, follows a traditional organization and now features an increased focus on thermochemistry, as well as new problems, new two-column examples, and a dynamic new four-color design. Written by a dedicated chemical educator and researcher, the text also includes a review of calculus applications as applied to physical chemistry. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

## **Elements of Physical Chemistry**

John Servos explains the emergence of physical chemistry in America by presenting a series of lively portraits of such pivotal figures as Wilhelm Ostwald, A. A. Noyes, G. N. Lewis, and Linus Pauling, and of key institutions, including MIT, the University of California at Berkeley, and Caltech. In the early twentieth century, physical chemistry was a new hybrid science, the molecular biology of its time. The names of its progenitors were familiar to everyone who was scientifically literate; studies of aqueous solutions and of chemical thermodynamics had transformed scientific knowledge of chemical affinity. By exploring the relationship of the discipline to industry and to other sciences, and by tracing the research of its leading American practitioners, Servos shows how physical chemistry was eclipsed by its own offspring--specialties like quantum chemistry.

## **Physical Chemistry**

## **Experimental Physical Chemistry**

This elegant book provides a student-friendly introduction to the subject of physical chemistry. It is concise and more compact than standard textbooks on the subject and it emphasises the two important concepts underpinning physical chemistry: quantum mechanics and the second law of thermodynamics. The principles are challenging to students because they both focus on uncertainty and probability. The book explains these fundamental concepts clearly and shows how they offer the key to understanding the wide range of chemical phenomena including atomic and molecular spectra, the structure and properties of solids, liquids and gases, chemical equilibrium, and the rates of chemical reactions.

## **A Life Scientist's Guide to Physical Chemistry**

Elements of Physical Chemistry has been carefully crafted to help students increase their confidence when using physics and mathematics to answer fundamental questions about the structure of molecules, how chemical reactions take place, and why materials behave the way they do.

## **Physical Chemistry of Gas-Liquid Interfaces**

This book is about the underlying principles of symmetry, thermodynamics and electronic structure that pertain to crystalline solids. After years of teaching graduate students in the areas covered, the author has a good idea of what major notions of group theory and thermodynamics are useful to students of solid state chemistry, and of what fundamental concepts are necessary for a clear understanding. Thus the book deals with lattice symmetry, space groups, reciprocal space, Landau theory, X-ray diffraction, heterogeneous equilibria and simple band theory, in a rigorous and thorough treatment.

## **Physical Chemistry**

"This admirable text provides a solid foundation in the fundamentals of physical chemistry including quantum mechanics and statistical mechanics/thermodynamics. The presentation assists the students in developing an intuitive understanding of the subjects as well as skill in quantitative manipulations. Particularly exciting is the treatment of larger molecular systems. With a firm but gentle hand, the student is led to several organized molecular assemblies including supramolecular systems and models of the origin of life. By learning of some of the most productive areas of current chemical research, the student may see the discipline as an active, young science in addition to its many accomplishments of earlier years. This text makes physical chemistry fun and demonstrates why so many find it a stimulating and rewarding profession." Professor Edel Wasserman, President (1999) of the American Chemical Society

## **Physical Chemistry**

This book offers an account of the field of physical chemistry as it has evolved over the years, from its emergence as a distinct discipline in the late 19th century through today's miracle discoveries. The book covers all of the main branches of physical chemistry: thermodynamics, kinetic theory, statistical mechanics, spectroscopy, electrochemistry, quantum chemistry, and colloid and surface chemistry. It describes the difficulties faced by early investigators resulting from attitudes of the churches, governments, and even the universities, which tended to emphasize classical studies. The book also discusses the ways in which physical scientists have communicated with each other over the course of the discipline's history. Teachers, researchers and students of physical chemistry as well as physicists and historians of science will find

this lively book interesting and informative.

## **Physical Chemistry for Engineering and Applied Sciences**

The Second Revised Edition Of The Book Is Intended To Meet The Requirement Of The Students Of Science, Engineering And Other Professional Courses At The Undergraduate Level. It Has Been Planned Strictly In Line With The Syllabi Of Various Indian Universities Who Have Adopted The New Ten-Plus-Two-Plus-Three Pattern Of Education. A New Chapter On Macromolecules Has Been Added, Thus Making A Total Of 27 Chapters In The Revised Edition. Chapters On Chemical Equilibrium, Colligative Properties, Atomic Structures, Chemical Bonding Have Been Thoroughly Reshuffled And Rewritten. Chapter 25 Has Been Rearranged And Divided Into Two Chapters Viz., Molecular Spectroscopy And Electrical And Magnetic Properties. New Sections Have Been Added To Chapters On Gaseous State, Colligative Properties, Electrolytic Conduction, Ionic Equilibria, Chemical Kinetics, Atomic Structure And Chemical Bonding. Other Chapters Have Also Been Modified And Redesigned. The Subject Matter Has Been Given In A Logical, Simple And Lucid Language. The Main Aim Has Been On Self Learning. Some More Diagrams And Illustrations Have Been Added In This Edition For Explaining The Basics And The Fundamentals Of The Subject. Conventional Problems In The Earlier Edition Have Been Dropped, But General And Objective Type Problems Are Retained. A Considerable Number Of Worked-Out Problems Have Been Included In Most Of The Chapters. These Would Expose The Students To Applications Of Various Concepts And Fundamentals Of The Subject. The Revised Text Largely Uses Si Units But Cgs Units Have Been Retained In Those Cases Where The Si Units Have Not As Yet Been Fully Appreciated. We Have Attempted To Present A Revised Text That Effectively Provides Clean, Accurate And Balanced Views On Various Topics To Grasp The Fundamentals Of The Subject More Clearly, Comprehensively And Concretely. The Book Should Meet The Requirements Of Students.

## **Principles of Physical Chemistry**

This loose-leaf, three-hole punched version of the textbook gives students the flexibility to take only what they need to class and add their own notes--all at an affordable price. For courses in Quantum Chemistry. A visual, conceptual and contemporary approach to Physical Chemistry Engel and Reid's Quantum Chemistry & Spectroscopy provides a contemporary, conceptual, and visual introduction to physical chemistry. The authors emphasize the vibrancy of physical chemistry today and illustrate its relevance to the world around us, using modern applications drawn from biology, environmental science, and material science. The 4th Edition provides visual summaries of important concepts and connections in each chapter, offers students "just-in-time" math help, and expands content to cover science relevant to physical chemistry. Tutorials in Mastering(tm) Chemistry reinforce students' understanding of complex theory in Quantum Chemistry and Thermodynamics as they build problem-solving skills throughout the course. Also available with Mastering

Chemistry Mastering(tm) is the teaching and learning platform that empowers you to reach every student. By combining trusted author content with digital tools developed to engage students and emulate the office-hour experience, Mastering personalizes learning and often improves results for each student. Instructors ensure students arrive ready to learn by assigning educationally effective content before class, and encourage critical thinking and retention with in-class resources such as Learning Catalytics. NOTE: You are purchasing a standalone product; Mastering(tm) Geography does not come packaged with this content. Students, if interested in purchasing this title with Mastering Geography, ask your instructor to confirm the correct package ISBN and Course ID. Instructors, contact your Pearson representative for more information. If you would like to purchase both the loose-leaf version of the text and Mastering Geography, search for: 0134861981 / 9780134861982 Physical Chemistry: Quantum Chemistry and Spectroscopy, Books a la Carte Plus MasteringChemistry with Pearson eText -- Access Card Package, 4/e

## **An Introduction to the Physical Chemistry of Food**

This new volume, Physical Chemistry for Engineering and Applied Sciences: Theoretical and Methodological Implications, introduces readers to some of the latest research applications of physical chemistry. The compilation of this volume was motivated by the tremendous increase of useful research work in the field of physical chemistry and related subjects in recent years, and the need for communication between physical chemists, physicists, and biophysicists. This volume reflects the huge breadth and diversity in research and the applications in physical chemistry and physical chemistry techniques, providing case studies that are tailored to particular research interests. It examines the industrial processes for emerging materials, determines practical use under a wide range of conditions, and establishes what is needed to produce a new generation of materials. The chapter authors, affiliated with prestigious scientific institutions from around the world, share their research on new and innovative applications in physical chemistry. The chapters in the volume are divided into several areas, covering developments in physical chemistry of modern materials polymer science and engineering nanoscience and nanotechnology

## **Physical Chemistry**

This English translation of a well-known Japanese book covers interfacial physicochemistry in materials science, especially for iron- and steelmaking processes. Interfacial Physical Chemistry of High-Temperature Melts bridges the gap between the basics and applications of physicochemistry. The book begins with an overview of the fundamentals of interfacial physical chemistry and discusses surface tension, describing the derivation of important equations to guide readers to a deep understanding of the phenomenon. The book then goes on to introduce interfacial properties of high-temperature melts, especially the Marangoni effect, and discusses applications to materials processing at high temperature focusing on recent

research results by the author and the co-workers. This book is aimed at researchers, graduate students, and professionals in materials processing. Video clips of in-situ observation including experiments under microgravity condition and x-ray observation are available for download on the publisher's website to allow for a deeper understanding.

## **Atkins' Physical Chemistry**

Motivating students to engage with physical chemistry through biological examples, this textbook demonstrates how the tools of physical chemistry can be used to illuminate biological questions. It clearly explains key principles and their relevance to life science students, using only the most straightforward and relevant mathematical tools. More than 350 exercises are spread throughout the chapters, covering a wide range of biological applications and explaining issues that students often find challenging. These, along with problems at the end of each chapter and end-of-term review questions, encourage active and continuous study. Over 130 worked examples, many deriving directly from life sciences, help students connect principles and theories to their own laboratory studies. Connections between experimental measurements and key theoretical quantities are frequently highlighted and reinforced. Answers to the exercises are included in the book. Fully worked solutions and answers to the review problems, password-protected for instructors, are available at [www.cambridge.org/roussel](http://www.cambridge.org/roussel).

## **Concepts in Physical Chemistry**

This book is designed for a one-semester course, for undergraduates, not necessarily chemistry majors, who need to know something about physical chemistry. The emphasis is not on mathematical rigor, but subtleties and conceptual difficulties are not hidden. It covers the essential topics in physical chemistry, including the state of matter, thermodynamics, chemical kinetics, phase and chemical equilibria, introduction to quantum theory, and molecular spectroscopy. Supplementary materials are available upon request for all instructors who adopt this book as a course text. Please send your request to [sales@wspc.com](mailto:sales@wspc.com).

## **Principles of Physical Chemistry**

This book is a physical chemistry textbook that presents the essentials of physical chemistry as a logical sequence from its most modest beginning to contemporary research topics. Many books currently on the market focus on the problem sets with a cursory treatment of the conceptual background and theoretical material, whereas this book is concerned only with the conceptual development of the subject. Comprised of 19 chapters, the book will address ideal gas laws, real gases, the thermodynamics of simple systems, thermochemistry, entropy and the second law, the Gibbs free energy, equilibrium,

statistical approaches to thermodynamics, the phase rule, chemical kinetics, liquids and solids, solution chemistry, conductivity, electrochemical cells, atomic theory, wave mechanics of simple systems, molecular orbital theory, experimental determination of molecular structure, and photochemistry and the theory of chemical kinetics.

## **Physical Chemistry for the Chemical and Biological Sciences**

Reference guide to the key concepts of physical chemistry; in dictionary format

## **A Textbook of Physical Chemistry**

Designed for a two-semester introductory course sequence in physical chemistry, *Physical Chemistry: A Modern Introduction, Second Edition* offers a streamlined introduction to the subject. Focusing on core concepts, the text stresses fundamental issues and includes basic examples rather than the myriad of applications often presented in other, more

## **Physical Chemistry from Ostwald to Pauling**

*Principles of Physical Chemistry* presents a novel approach to physical chemistry that emphasizes the use of a few fundamental principles to quantitatively describe the nature of molecules and their assemblies. It begins with atoms and molecules, using the electron-in-a-box model to illustrate the essential features of quantum mechanics and why atoms and molecules exist. Thermodynamics is not introduced in the classical manner, considering the first and second law as postulates, but approached by studying assemblies of molecules statistically. The authors proceed to molecular assemblies of increasing complexity, evolving from ideal gases to real gases and solutions, then to macromolecules and supramolecular machines, and ending with the search for the logical conditions and chemical requirements for physicochemical processes leading to life's origin, the emergence of matter that carries information. This text is ideal for both undergraduate and graduate courses in physical chemistry, providing a basis for understanding the nature of chemical processes in biology, chemistry, and engineering.

## **Physical Chemistry**

*Understanding Physical Chemistry* is a gentle introduction to the principles and applications of physical chemistry. The book aims to introduce the concepts and theories in a structured manner through a wide range of carefully chosen examples and case studies drawn from everyday life. These real-life examples and applications are presented first, with any necessary chemical and mathematical theory discussed afterwards. This makes the book extremely accessible and directly relevant to

the reader. Aimed at undergraduate students taking a first course in physical chemistry, this book offers an accessible approach to enhance understanding and encourage and inspire the reader to learn more about the subject. A comprehensive introduction to physical chemistry starting from first principles. Carefully structured into short, self-contained chapters. Introduces examples and applications first, followed by the necessary chemical theory.

## **Physical Chemistry**

A textbook for B.Sc Classes as per the UGC Model Syllabus. The book is visually beautiful and authors communicate their enthusiasm and enjoyment of the subject in every chapter. This textbook is currently in use at hundreds of colleges and universities throughout the country and is a national best-seller. There are hundreds of computer-generated coloured diagrams, graphs, photos and tables .

## **Encyclopedia of Chemical Physics and Physical Chemistry: Applications**

A Textbook of Physical Chemistry: Second Edition provides both a traditional and theoretical approach in the study of physical chemistry. The book covers subjects usually covered in chemistry textbooks such as ideal and non-ideal gases, the kinetic molecular theory of gases and the distribution laws, and the additive physical properties of matter. Also covered are the three laws of thermodynamics, thermochemistry, chemical equilibrium, liquids and their simple phase equilibria, the solutions of nonelectrolytes, and heterogeneous equilibrium. The text is recommended for college-level chemistry students, especially those who are in need of a textbook for the subject.

## **Physical Chemistry of Solids**

## **The World of Physical Chemistry**

This new edition of Robert G. Mortimer's Physical Chemistry has been thoroughly revised for use in a full year course in modern physical chemistry. In this edition, Mortimer has included recent developments in the theories of chemical reaction kinetics and molecular quantum mechanics, as well as in the experimental study of extremely rapid chemical reactions. While Mortimer has made substantial improvements in the selection and updating of topics, he has retained the clarity of presentation, the integration of description and theory, and the level of rigor that made the first edition so successful. \* Emphasizes clarity; every aspect of the first edition has been examined and revised as needed to make the principles and

applications of physical chemistry as clear as possible. \* Proceeds from fundamental principles or postulates and shows how the consequences of these principles and postulates apply to the chemical and physical phenomena being studied. \* Encourages the student not only to know the applications in physical chemistry but to understand where they come from. \* Treats all topics relevant to undergraduate physical chemistry.

## **Elementary Physical Chemistry**

### **Physical Chemistry**

2019 RITA® Award Winner for Contemporary Romance: Mid-Length! After four lousy boyfriends in a row, chemical engineer Penny Popplestone swears off men until she can figure out why they keep cheating on her. But her no-men resolution hits a snag when the mysterious and superhumanly hot barista at her favorite coffee shop strikes up a friendship with her. Penny strives to keep things platonic, but when Caleb gives her the kiss of her life, she realizes he wants to be more than just friends. Tired of always being “good little Penny,” she throws caution to the wind and pursues a no-strings fling with the hottie barista. It’s not like they have anything in common beyond scorching physical chemistry, so what does she have to lose? Only her heart. Now, this fanfic-reading, plus-size heroine faces an unsolvable problem. What do you do when being apart is unbearable...but being together is impossible? This steamy, lighthearted romance is the third in a series of standalone rom-coms featuring geeky heroines who work in STEM fields.

### **Physical Chemistry**

It is sometimes said that the year of birth of physical chemistry was 1887. In that year the journal *Zeitschrift für physikalische Chemie* - the first journal devoted exclusively to physical chemistry - was launched and in its first year published important papers by Arrhenius and van't Hoff. However, a good deal of physical chemistry had been done previously. Two centuries earlier Robert Boyle had been carrying out physico-chemical investigations, and a good case can be made for regarding him as the first physical chemist. His approach to chemistry had a great influence on others, including Isaac Newton. In the eighteenth century Joseph Black and Antoine Lavoisier also did much that can be classed as physical chemistry. In the nineteenth century Robert Bunsen, Michael Faraday, and many others were also contributing to the development of the subject. In this book Professor Laidler gives an account of the scientific development of physical chemistry over the years. He begins by discussing just what physical chemistry is, and how it relates to other sciences. He considers some of the difficulties faced by early investigators, as a result of attitudes of the Churches, governments, and even the universities which at first were mainly interested in classical studies. Some account is also given of the way in

which physical scientists have communicated with each other. Classical mechanics, and the modifications that had to be made to it, are briefly considered. The bulk of the book is concerned with the main branches of physical chemistry - thermodynamics, kinetic theory, statistical mechanics, spectroscopy, electrochemistry, kinetics, colloid and surface chemistry, and quantum chemistry - and how these subjects have developed up to the present time.

## **Physical Chemistry for the Life Sciences**

Much of chemistry is motivated by asking 'How'? How do I make a primary alcohol? React a Grignard reagent with formaldehyde. Physical chemistry is motivated by asking 'Why'? The Grignard reagent and formaldehyde follow a molecular dance known as a reaction mechanism in which stronger bonds are made at the expense of weaker bonds. If you are interested in asking 'why' and not just 'how', then you need to understand physical chemistry. *Physical Chemistry: How Chemistry Works* takes a fresh approach to teaching in physical chemistry. This modern textbook is designed to excite and engage undergraduate chemistry students and prepare them for how they will employ physical chemistry in real life. The student-friendly approach and practical, contemporary examples facilitate an understanding of the physical chemical aspects of any system, allowing students of inorganic chemistry, organic chemistry, analytical chemistry and biochemistry to be fluent in the essentials of physical chemistry in order to understand synthesis, intermolecular interactions and materials properties. For students who are deeply interested in the subject of physical chemistry, the textbook facilitates further study by connecting them to the frontiers of research. Provides students with the physical and mathematical machinery to understand the physical chemical aspects of any system. Integrates regular examples drawn from the literature, from contemporary issues and research, to engage students with relevant and illustrative details. Important topics are introduced and returned to in later chapters: key concepts are reinforced and discussed in more depth as students acquire more tools. Chapters begin with a preview of important concepts and conclude with a summary of important equations. Each chapter includes worked examples and exercises: discussion questions, simple equation manipulation questions, and problem-solving exercises. Accompanied by supplementary online material: worked examples for students and a solutions manual for instructors. Written by an experienced instructor, researcher and author in physical chemistry, with a voice and perspective that is pedagogical and engaging.

## **Quanta, Matter, and Change**

This book is the sixth of the seven-volume series, which provides an extensive coverage of several topics of Physical Chemistry. Each volume includes a large number of illustrative numerical and typical problems to highlight the principles involved. IUPAC recommendations along with SI units have been incorporated in this series.

## Physical Chemistry

This volume features a greater emphasis on the molecular view of physical chemistry and a move away from classical thermodynamics. It offers greater explanation and support in mathematics which remains an intrinsic part of physical chemistry.

### Basic Physical Chemistry

Most people remember chemistry from their schooldays as largely incomprehensible, a subject that was fact-rich but understanding-poor, smelly, and so far removed from the real world of events and pleasures that there seemed little point, except for the most introverted, in coming to terms with its grubby concepts, spells, recipes, and rules. Peter Atkins wants to change all that. In this Very Short Introduction to Chemistry, he encourages us to look at chemistry anew, through a chemist's eyes, in order to understand its central concepts and to see how it contributes not only towards our material comfort, but also to human culture. Atkins shows how chemistry provides the infrastructure of our world, through the chemical industry, the fuels of heating, power generation, and transport, as well as the fabrics of our clothing and furnishings. By considering the remarkable achievements that chemistry has made, and examining its place between both physics and biology, Atkins presents a fascinating, clear, and rigorous exploration of the world of chemistry - its structure, core concepts, and exciting contributions to new cutting-edge technologies. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

### Advanced Physical Chemistry

Familiar combinations of ingredients and processing make the structures that give food its properties. For example in ice cream, the emulsifiers and proteins stabilize partly crystalline milk fat as an emulsion, freezing (crystallization) of some of the water gives the product its hardness and polysaccharide stabilizers keep it smooth. Why different recipes work as they do is largely governed by the rules of physical chemistry. This textbook introduces the physical chemistry essential to understanding the behavior of foods. Starting with the simplest model of molecules attracting and repelling one another while being moved by the randomizing effect of heat, the laws of thermodynamics are used to derive important properties of foods such as flavor binding and water activity. Most foods contain multiple phases and the same molecular model is used to understand phase diagrams, phase separation and the properties of surfaces. The remaining chapters focus on the formation and properties of specific structures in foods - crystals, polymers, dispersions and gels. Only a basic

understanding of food science is needed, and no mathematics or chemistry beyond the introductory college courses is required. At all stages, examples from the primary literature are used to illustrate the text and to highlight the practical applications of physical chemistry in food science.

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