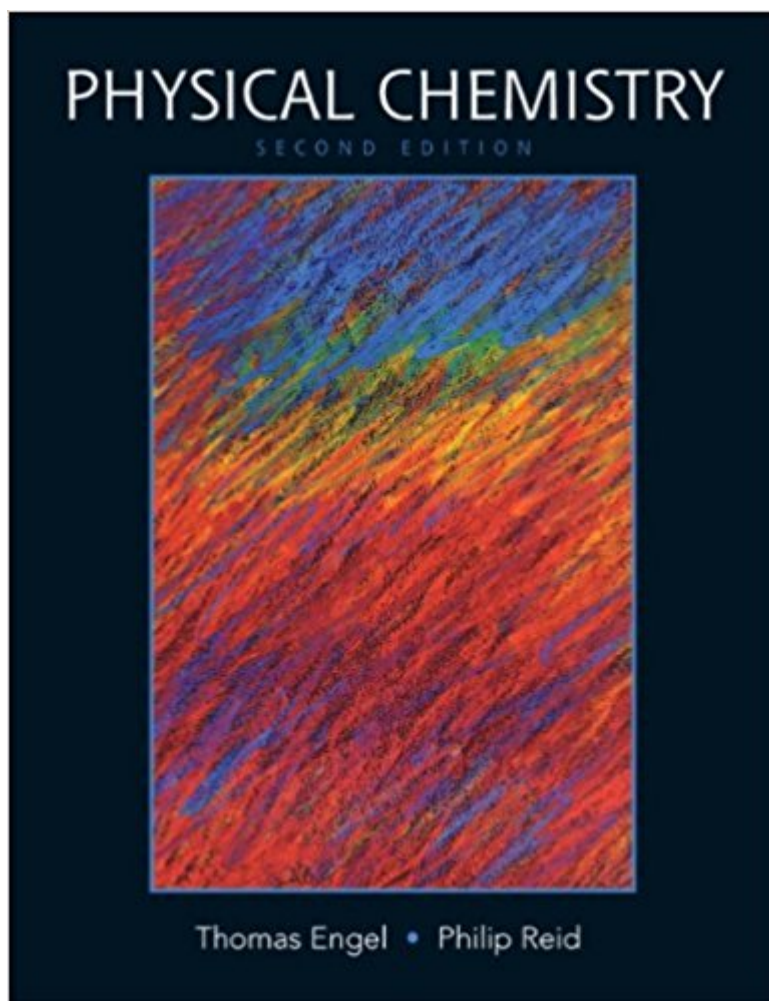


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Physical Chemistry (2nd Edition)



Synopsis

This full-color, modern physical chemistry reference offers compelling applications and arresting illustrations that capture readers' attention and demonstrate the dynamic nature of the subject. The authors focus on core topics of physical chemistry, presented within a modern framework of applications. Modern applications are drawn from biology, environmental science, and material science. Spectroscopy applications are introduced early in concert with theory; for example, IR and rotational spectroscopy are discussed immediately after the harmonic oscillator and the rigid rotator. Modern research is featured throughout, along with new developments in the field such as scanning tunneling microscopy, bandgap engineering, quantum wells, teleportation, and quantum computing. Fundamental Concepts of Thermodynamics; Heat, Work, Internal Energy, Enthalpy, and the First Law of Thermodynamics; The Importance of State Functions: Internal Energy and Enthalpy; Thermochemistry; Entropy and the Second and Third Laws of Thermodynamics; Chemical Equilibrium; The Properties of Real Gases; Phase Diagrams and the Relative Stability of Solids, Liquids, and Gases; Ideal and Real Solutions; Electrolyte Solutions; Electrochemical Cells, Batteries, and Fuel Cells; From Classical to Quantum Mechanics; The Schrödinger Equation; The Quantum Mechanical Postulates; Using Quantum Mechanics on Simple Systems; The Particle in the Box and the Real World; Commuting and Noncommuting Operators and the Surprising Consequences; A Quantum Mechanical Model for the Vibration and Rotation of Molecules; The Vibrational and Rotational Spectroscopy of Diatomic Molecules; The Hydrogen Atom; Many-Electron Atoms; Quantum States for Many-electron Atoms and Atomic Spectroscopy; The Chemical Bond in Diatomic Molecules; Molecular Structure and Energy Levels for Polyatomic Molecules; Electronic Spectroscopy; Computational Chemistry; Molecular Symmetry; Nuclear Magnetic Resonance Spectroscopy; Probability; The Boltzmann Distribution; Ensemble and Molecular Partition Functions; Kinetic Theory of Gases; Transport Phenomena; Elementary Chemical Kinetics; Complex Reaction Mechanisms. A useful reference for chemistry professionals.

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Customer Reviews

Thomas Engel has taught chemistry for more than 20 years at the University of Washington, where he is currently Professor of Chemistry and Associate Chair for the Undergraduate Program.

Professor Engel received his bachelor's and master's degrees in chemistry from the Johns Hopkins University, and his Ph.D. in chemistry from the University of Chicago. He then spent 11 years as a researcher in Germany and Switzerland, in which time he received the Dr. rer. nat. habil. degree from the Ludwig Maximilians University in Munich. In 1980, he left the IBM research laboratory in Zurich to become a faculty member at the University of Washington. Professor Engel's research interests are in the area of surface chemistry, and he has published more than 80 articles and book chapters in this field. He has received the Surface Chemistry or Colloids Award from the American Chemical Society and a Senior Humboldt Research Award from the Alexander von Humboldt Foundation, which has allowed him to establish collaborations with researchers in Germany. He is currently working together with European manufacturers of catalytic converters to improve their performance for diesel engines. Philip Reid has taught chemistry at the University of Washington since he joined the chemistry faculty in 1995. Professor Reid received his bachelor's degree from the University of Puget Sound in 1986, and his Ph.D. in chemistry from the University of California at Berkeley in 1992. He performed postdoctoral research at the University of Minnesota, Twin Cities, campus before moving to Washington. Professor Reid's research interests are in the areas of atmosphere chemistry, condensed-phase reaction dynamics, and nonlinear optical materials. He has published more than 70 articles in these fields. Professor Reid is the recipient of a CAREER award from the National Science Foundation, is a Cottrell Scholar of the Research Corporation, and is a Sloan fellow.

I think this book was chosen because it offers both macroscopic (thermo) and microscopic (quantum) physical chemistry. It should be good for two semesters of physical chemistry... should be...This book was terrible for explaining everything. I have a strong physics background including taking the physics courses that would equate to both these courses using Carter and Townsend for

thermo and quantum respectively. This book was just written at such a low level and organized so poorly there was really nothing it could be used for. It didn't explain material well and it surely did not organize material well. This is one of those books that I couldn't figure out what they were doing before they started writing down equations, and I only knew what was going on because I had done those derivations before. I strongly caution against using this book for anything. It's overpriced and absolutely useless.

When one peruses Engel's chapter headings, one gets the impression that he/she will get a clear, practical exposition of topics of use to the chem student, or working chemist. When reading through the text, this expectation is invariably dissatisfied. Topics are presented in an ad-hoc, haphazard manner, with no apparent unifying reason. Engel does have reasons for choosing the topics and examples he does, but I only knew what they were because I studied the same material in other sources. If you want to develop an intuitive sense for this material, and wish to think strategically and conceptually about how to solve these problems, you won't find much guidance here. The text comes off rather more like a hodgepodge of science trivia. Engel does present much valuable information, but his great weakness is his inability to distinguish a conceptual framework from the details of his exposition. In chapter two, for example he presents, out of the blue, a detailed discussion of the dependence of heat capacity on temperature, having not yet shown the role that heat capacity would play in solving energy conservation problems. One cannot help being misled, and ultimately wasting much time and effort in trying to apply concepts in a context where their application is inappropriate. In retrospect, Dr. Engel's text could be made much more effective were it re-written, with more emphasis given to conceptual development. In presenting a text, one must constantly have in mind the questions, what is my goal, and what tools am I developing to enable me to reach it. Engel seems not to have had these questions at the forefront. His text seems rather like a first draft, which could be significantly improved, were he to take a step back, and ask himself, "is this really understandable?" One of the best pieces of advice ever given to me came from my high school math teacher, who told us that whenever we solved some long problem, we need to then step back, and ask ourselves, "does my answer make sense?". In writing this text, Dr. Engel is attempting to answer the question "what does a student need to know about physical chemistry?" He needs to follow the advice of my high school math teacher, and now ask himself, "does my answer make sense?"

This book does not have the full number of pages that you need. It states that the book has 1128

pages and it really only has 1040. It leaves off the tables in the back that give you the physical constants needed to solve most problems in physical chemistry.

This book is TERRIBLE. I am a senior Chemistry major who loves Chemistry, but I have hated both semesters of my Physical Chemistry class thanks to this book. It is very vague and confusing in almost every way imaginable. Explanations to concepts are basically encoded in paragraphs of confusing and unimportant information. Congratulations if you are able to find any of the text helpful. If you use this book, you MUST buy the solutions manual if you have any hope of completing many homework problems. Even with the solution manual, numerous steps are left out of almost all explanations. I utterly despise this book. I would NOT recommend ANYTHING by these authors to anyone. I have never been so ready to finish a class as I am this one.

terrible book, my pchem professor's notes are my go-to place for solving equations. i tried very hard to make use of this book and thoroughly read the first 8 chapters or so but it doesnt seem to speed up my studying at all. book totally sucks. i read and read for the first test and got an 86 on it, then i didnt even look at the book at all and just studied the lecture notes and did our problem set questions and got an 88 on the second test and it was harder material so i say screw the book! 99% of the equations and derivations in the book you'll never use. The solutions manual for this book is much more help than the book itself. so i'd say if your on a budget, buy the solutions manual before you buy the book. the solutions manual isnt great because it only has maybe 1/7th of the end of chapter problems but atleast its something you can look at and see how to do real problems. if your a mathematician and you love deriving formulas, then youll love the book, if your just trying to make it thru pchem then youll hate the book. oh, and the values for constants in the examples are not to be trusted! i lost points on a problem set because i used the surface tension constant for water directly from an example in the book and it was in newtons something and it was supposed to be in miillinewtons something. so then i checked the tables at the end of the book and sure enough, different number than the example had! youd think people would proof read the examples, i guess not! have fun with pchem

I don't even know where to begin with this book. Had it not been a requirement for homework, I would've returned it. The purpose of a textbook is to provide examples for students to reference to and apply, but I found myself going online to get help because the text was so hard to follow and understand. I hope I never have to buy another textbook written by either of these men, I wouldn't

learn anything

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