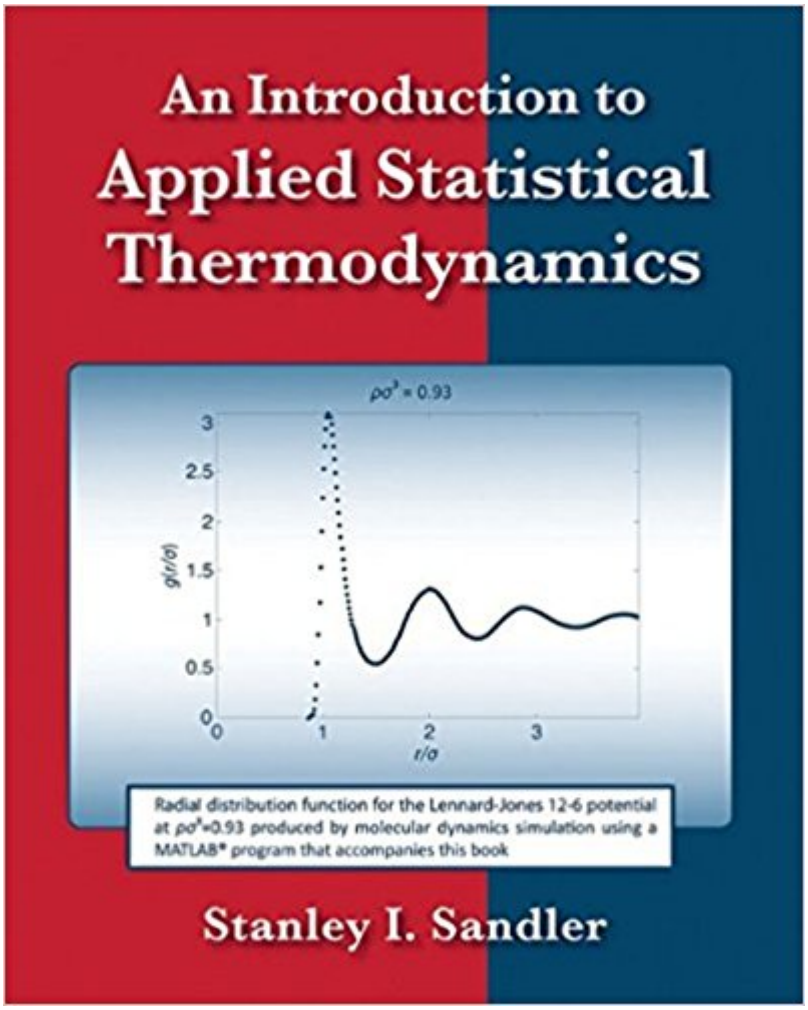
An Introduction To Applied Statistical Thermodynamics



Synopsis

One of the goals of An Introduction to Applied Statistical Thermodynamics is to introduce readers to the fundamental ideas and engineering uses of statistical thermodynamics, and the equilibrium part of the statistical mechanics. This text emphasises on nano and bio technologies, molecular level descriptions and understandings offered by statistical mechanics. It provides an introduction to the simplest forms of Monte Carlo and molecular dynamics simulation (albeit only for simple spherical molecules) and user-friendly MATLAB programs for doing such simulations, and also some other calculations. The purpose of thisÂ text is to provide a readable introduction to statistical thermodynamics, show its utility and the way the results obtained lead to useful generalisations for practical application. The text also illustrates the difficulties that arise in the statistical thermodynamics of dense fluids as seen in the discussion of liquids.

Book Information

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Customer Reviews

Straight forward and easy to follow. You can almost read is straight through it (at least the first 2 or 3 chapters) without having to retrace and think out what he is trying to say.

Really well written textbook. It makes the subject very easy to understand.

great condition

good

This book seems like it wasn’t even read through before published. Many equations are incorrect, names are misspelled, tons of run-on-sentences and an overall lack of real, quality explanations. Do not get this book

The vendor was excellent and shipped the book to us quickly. And we love . Live on it, practically. So we have absolutely no issues with these parts of the purchase.My husband needs this book for his spring engineering course, and we got it at about a 50% discount. Man, are we glad we did - at least by our first impression. This text is no more than a half to 3/4 inch thick. It is a softcover book. So far, we have no idea how good it is - only that it is required reading. So, my preliminary/early assessment is that paying full price for this text may be foolish if it’s unnecessary. We are hoping the book proves its worth by being shelf-worthy beyond the scope of the course. That will take a little time.If my husband is floored by the utility of this text I will come back and update the rating & review. If he isn’t, this rank will stand.

Using this textbook I taught Statistical Thermodynamics in CHEG 825 at the Chemical Engineering Department at the University of Delaware to 24 first-year graduate students in 2010. Having based my lectures and homework assignments on this book, I became very familiar with the content. Although I had a choice of several alternative texts to use instead, there is no alternative text that I would have rather used.The text is written with succinct clarity and is understandable to an advanced undergraduate or early graduate student. The reader should have a prior undergraduate course in physical chemistry, specifically covering classical thermodynamics, as well as exposure to basic concepts in probability. For example at the beginning, the basic machinery of the subject is introduced using lucid explanations probabilistic states, microstates and fundamental postulates which ultimately lead to a natural explanation and derivation of the Boltzmann energy distribution. Throughout the book each important result is derived and each derivation is presented step-by-step. This helps the reader follow how logical and physical arguments are expressed mathematically to derive the important results. Any reader can appreciate the detail with which derivations are presented. This helps to validate his/her own understanding and helps each student as (s)he applies the methods to new problems.I also very much appreciate that the content is both practical and interesting. This is not an expository text on all statistical thermodynamics per se. Instead there are a couple themes that are helpful to emphasize during a course. The first theme is that using these methods one can begin to calculate important engineering properties given molecular

structure. The student already knows (s)he cannot do this using purely-macroscopic, classical thermodynamics. Consequently this text might be a student's first foray to understand quantitatively molecular structure-property relationships. The perspective buyer can read the table of contents to see how this is done step-by-step. The second theme is that the material can explain how many common engineering material property correlations came about, why they have limitations and how they can be improved. Now the thermodynamic correlations learned earlier in the classical thermodynamics course make sense. I found this helps elicit students' interest in the material. I found these two themes useful in my lectures.I heartily recommend this book to those teaching+learning statistical thermodynamics as a prelude to the more esoteric methods in this field. The book provides a lucid communication of the basic concepts as well as useful methods and results which can be applied in numerous technical fields.