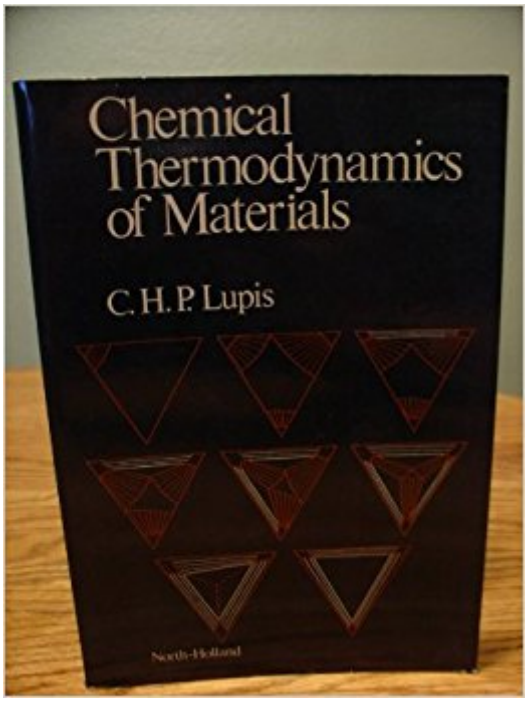
Chemical Thermodynamics Of Materials



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Customer Reviews

Drawing on the author’s unique insights, superior research, and extensive teaching experience, this volume helps readers develop a sound working knowledge of the chemical thermodynamics of materials -- without encountering the difficulties often associated with studying this complex subject. Considers chemical reactions, phase diagrams, interfaces, thermodynamics of solutions, and multicomponent systems, and makes use of statistical models and both analytic and numerical techniques that are computer-compatible. --This text refers to an out of print or unavailable edition of this title.

This is a great book. I bought my first copy approximately 25 years ago with my first graduate student. I was pleased to see that it was available for print on demand. I hope it remains that way for a long time. I would love to use it as a text for graduate thermodynamics in the geophysical sciences. I hope the owners of the copy-rite consider making it into a kindle book. That would broaden the availability of the text. There are very few modern thermodynamics books that are in this books class!

The book by Lupis is certainly not a book for the novice. In order to get the most out the book, a prior understanding of the principles of macroscopic thermodynamics is essential. Although the book covers the laws of thermodynamics in the first few chapters, it should be considered as an advanced and a very dense summary. What makes this is book so unique is the approach to

problems in terms of open and closed systems. Such an approach is not the case in many other thermodynamics books such as the one by Gaskell, Darken & Gurry, Swalin etc. I believe that Lupis' approach is very effective in forging the concept of chemical potential into the readers mind and as such, the pedagogical merits are to be recognized.Stability is discussed in a rather unorthodox manner and, a whole chapter is devoted to this concept. This is an example of the "philosophical depth" of the treatment. One aspect of the book that I enjoyed a lot when I was in graduate school is its comprehensiveness in the treatment. You will find pretty much everything from, say, solution thermodynamics to surface thermodynamics at a rather advanced level but in utmost clarity. Especially, the treatment of solution thermodynamics should not go unmentioned. Although, there are many books that treat solution thermodynamics in a very effective fashion such as "The Physical Chemistry of Metals and Alloys by Darken & Gurry" as well as the book by Gaskel, Lupis' treatment is very original and exceptionally rigorous. The discussion of reference states and standard states is unique and is not found in other "good" books. Indeed those two concepts are used interchangeably in many texts which is not only misleading but also wrong! It should also be mentioned that the book is much more mathematical than other books in this field. Furthermore, the problem sets given at the end of each chapter are extremely well-chosen and by all means not elementary. The student who expects "plug & go" type problems is bound to be duly and truly frustated. The only short coming of the book that I can think of is the order of the chapters. It somewhat deviates from the usual format but that should not cause any major problem with a little caution. The book can effectively be used in a graduate course in Chemical Thermodynamics of Materials. However, let me re-iterate that the reader must have mastered basic thermodynamics (undergraduate level) quite well.

The book by Lupis is by no means an introductory textbook. A prior understanding of the principles of macroscopic thermodynamics is essential so as to enjoy Dr. Lupis's masterful treatment of subject.Although the book covers the laws of thermodynamics in the first few chapters, it should be considered as an advanced and a very dense summary. What makes this is book so unique is the approach to problems in terms of open and closed systems. Such an approach is not the case in many other thermodynamics books such as the ones by Gaskell, Darken & Gurry, Swalin etc.In retrospect, as someone who has used this book for learning graduate level chemical thermodynamics, I am inclined to say that Lupis' approach is very effective in forging the concept of chemical potential into the readers mind. As such, the pedagogical merits are to be recognized, and Dr. Lupis is to be commended for having done a fine job.Some words of advice are in order,

however. Stability is discussed in a rather unorthodox manner, and a whole chapter is devoted to it. This is an example of the philosophical depth of the treatment. Therefore, patience is a true virtue while reading this text. No corner is cut in the discussion, and every important detail is elaborated very rigorously. The book is quite mathematical for a thermodynamics book, yet no special background is needed. A good grasp of differential calculus of multivariable functions is sufficient to read the book without any difficulty.One aspect of the book that is remarkable is its comprehensiveness. The reader will find topics ranging from solution thermodynamics to thermodynamics of surfaces. Clarity in the discussion is maintained from cover to cover, which is even more remarkable.I should point out that the treatment of solution thermodynamics is outstanding. Although, there are many books that treat solution thermodynamics in a very effective fashion such as "The Physical Chemistry of Metals and Alloys by Darken & Gurry" as well as the book by Gaskel, Lupis' treatment is very unique and exceptionally rigorous. Where else would you find a discussion on reference states and standard states, and learn that they are two different concepts, yet closely related to each other? Concepts such as those are usually given a cursory attention in most other "good" books, which almost always confuse the students. Above all, in most texts such vital topics are presented in a wrongful fashion.Multicomponent phase diagrams are also discussed at depth. Various solution models are also presented, which rounds up the discussion on solutions well.The book also contains plenty of well-chosen self-study problems in the end of each chapter. They are, however, not elementary. The student who expects "no-brainer" type of problems will certainly be very frustrated with this book!Overall, this book is an excellent graduate level textbook, and I hope it will be in print again sometimes soon.Entropy4Life----------

I can add little to Dr. Akdogan's thorough review, except to say that I agree with it, as do other professional scientists.

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