

PREFACE

This book with CD-ROM presents classical thermodynamics with an emphasis on chemical aspects. It is written primarily for students and graduate engineers of metals and materials. Since its treatment of the subject is sufficiently general, students in related fields such as physical chemistry and chemical engineering can also use it.

As thermodynamics is a key discipline in most science and engineering fields, a great number of books, each claiming originality in presentation and approach, have been published on the subject. However, thermodynamics is still a confusing subject for uninitiated students and an “easy to forget” one for graduate engineers.

After many years of experience both teaching thermodynamics at university and actually practising it in industry, I have concluded that the most effective way of presenting thermodynamics is to simulate the method that a lecturer would employ in class. When teaching, the lecturer may write important equations and concepts on the board, draw underlines, circle or place tick marks to emphasise important points, draw arrows to indicate relationships, use coloured chalk for visual effect, and erase some parts to write new lines. He/she may even repeat some parts to stress their importance. A book written on paper alone cannot properly simulate the techniques mentioned above.

This package consists of a book and a computer-aided learning package, and is both unique and beneficial in that it simulates the classroom interaction much more closely due to its employment of multimedia capabilities. Unlike the passive presentation found in most textbooks, this package provides the user with an interactive learning environment. Fast topic selection, free repetition and cross-referencing by toggling between sections or even other packages are just some of the advantages this package has. This approach is in many important respects better than those adopted by other available books on the subject.

This package provides a comprehensive treatment of all the important topics of thermodynamics. It is comprised of a number of smaller sections, each of which deals with a specific topic of thermodynamics. Each section is divided into three parts:

Text : This part covers the fundamental concepts of thermodynamics.

Examples : This part presents extended concepts through questions and answers.

Exercises : This part develops skills necessary to deal with numeric problems.

This book is intended for use primarily at the undergraduate level, but will also be useful to the practising graduate engineers in industry.

Having been evolved from my teaching materials, this book unavoidably includes a blending of knowledge of many other authors with that of my own. I acknowledge their contributions. I am indebted to my teacher, Professor Y.K. Rao for introducing me to the

world of thermodynamics. I am particularly grateful to my former colleague Professor Peter Hayes at The University of Queensland, Australia, for making many useful comments and giving me constant encouragement.

I want to acknowledge the major effort expended by many of my students: Y. B. Kang, T. I. Kim, C. H. Park and S. S. Lee for helping me to design this electronic book and H. J. Kong for helping to typeset the manuscript.

I am also pleased to acknowledge the financial support from The Commonwealth Government of Australia and Pohang University of Science and Technology, Korea.

Finally, I am deeply thankful to my wife and children for the love and encouragement they have given to me.

Hae-Geon Lee