

# Molecular Engineering Thermodynamics Cambridge

## Chemical

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master the principles of thermodynamics with this comprehensive undergraduate textbook carefully developed to provide students of chemical engineering and chemistry with a deep and intuitive

understanding of the practical applications of these fundamental ideas and principles logical and lucid explanations introduce core thermodynamic concepts in the context of their measurement and experimental origin giving students a thorough understanding of how theoretical concepts apply to practical situations a broad range of real world applications relate key topics to contemporary issues such as energy efficiency environmental engineering and climate change and further reinforce students understanding of the core material this is a carefully organized highly pedagogical treatment including over 500 open ended study questions for discussion over 150 varied homework problems clear and objective standards for measuring student progress and a password protected solution manual for instructors

an important part of inorganic chemistry is the study of the behaviour of chemical elements and their compounds if this behaviour is to be explained with any confidence it needs first to be described in quantitative language thermodynamics provides such a language and dr johnson s 1982 book is concerned with the theoretical explanations that become possible after the translation into thermodynamic language has taken place this book will continue to be of interest to advanced undergraduate and postgraduate students of chemistry as well as teachers of chemistry in both schools and universities

building up gradually from first principles this unique introduction to modern thermodynamics integrates classical statistical and molecular approaches and is especially designed to support students studying chemical and biochemical engineering in addition to covering traditional problems in engineering thermodynamics in the context of biology and materials chemistry students are also introduced to the thermodynamics of dna proteins polymers and surfaces it includes over 80 detailed worked examples covering a broad range of scenarios such as fuel cell efficiency dna protein binding semiconductor manufacturing and polymer foaming emphasizing the practical real world applications of thermodynamic principles more than 300 carefully tailored homework problems designed to stretch and extend students understanding of key topics accompanied by an online solution manual for instructors and all the necessary mathematical background plus resources summarizing commonly used symbols useful equations of state microscopic balances for open systems and links to useful online tools and datasets

thermodynamics fundamentals for applications is a text for a first graduate course in chemical engineering the focus is on macroscopic thermodynamics discussions of modeling and molecular situations are integrated throughout underpinning this text is the knowledge that while thermodynamics describes natural phenomena those descriptions are the products of creative systematic minds nature unfolds without reference to human concepts of energy entropy or fugacity natural complexity can be organized and studied by thermodynamics methodology the power of thermodynamics can be used to advantage if the fundamentals are understood this text s emphasis is on fundamentals rather than modeling knowledge of the basics will enhance the ability to combine

them with models when applying thermodynamics to practical situations while the goal of an engineering education is to teach effective problem solving this text never forgets the delight of discovery the satisfaction of grasping intricate concepts and the stimulation of the scholarly atmosphere

publisher description

the aim of this book is to develop the concepts and relations pertinent to the solution of many thermodynamic problems encountered in multi phase multi component systems in doing so it emphasizes a comprehension and development of general expressions for solving such problems rather than ready made equations for particular applications throughout the book the methods of gibbs are used with emphasis on the chemical potential

teaching thermodynamics in a logical but approachable manner in the context of modern process industries this text specifically targets important keystone concepts to ensure a strong foundation in the subject focus on mathematics is eschewed and instead the physical basis of thermodynamics is emphasised the book provides many industrially relevant worked examples and recognises the will of accrediting institutions by covering safety and design this book is of interest to chemical engineering students studying thermodynamics as well as researchers and industry professionals looking to consolidate their knowledge of this vital field to chemical engineering practice

chemical thermodynamics sets out to teach thermodynamics through its applications and presents the theory of the subject in short revision form while covering the syllabus required by the institution of chemical engineers the book discusses ideal systems in the early chapters before dealing with non ideal and open systems it provides examples graded from simple to more complex which follow the brief exposition of the theory in each chapter and gives special attention to areas which students find difficult these examples were selected to illustrate the theory without being repetitive and are given at the end of each revision section followed by answers also provided are three appendices dealing with mathematical requirements constants and units and conversion factors

learn classical thermodynamics alongside statistical mechanics and how macroscopic and microscopic ideas interweave with this fresh approach to the subjects

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