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Nota di contenuto	part SECTION I: Fundamentals -- chapter 1 Basic Concepts and Definitions -- chapter 2 The First and Second Laws of Thermodynamics -- chapter 3 Conservation of Energy in an Open Flow System. Definition of Enthalpy -- chapter 4 The Algebra of State Functions. The Helmholtz and Gibbs Functions -- chapter 5 Calculation of Changes in the Value of Thermodynamic Properties -- part SECTION II: Mixtures -- chapter 6 Partial Molar Properties and Property Changes by Mixing -- chapter 7 The Chemical Potential and the GibbsHelmholtz Equation -- chapter 8 The Principles of Physical and Chemical Equilibrium -- chapter 9 The Phase Rule and the Duhem Theorem -- chapter 10 Generality of the Thermodynamic Treatment for More Complex Systems -- chapter 11 Ideal Gas and Ideal Gas Mixtures -- chapter 12 Equilibrium in Terms of Fugacity and Activity -- chapter 13 Calculation of Fugacities from Equations of State -- chapter 14 Fugacity of a Mixture and of its Components -- chapter 15 Fugacities, Activities, and Activity Coefficients in Liquid Mixtures of Nonelectrolytes -- chapter 16 Activity Coefficients and Excess Properties -- chapter 17 Mixture Behavior, Stability, and Azeotropy -- chapter 18 The Thermodynamics of Aqueous Electrolyte Solutions -- part SECTION III: Applications --

chapter 19 The Thermodynamics of Chemical Reactions -- chapter 20 The Thermodynamics of Equilibrium-Based Separation Processes -- chapter 21 Heat Effects -- chapter 22 Adsorption of Gases on Solids -- part SECTION IV: Special Topics -- chapter 23 Thermodynamics of Flow of Compressible Fluids -- chapter 24 Elements of Statistical Thermodynamics -- chapter 25 Statistical Thermodynamics Basis of Equations of State -- chapter 26 Statistical Thermodynamics Justification of Some Commonly Used Expressions for the Excess Gibbs Energy -- chapter 27 The Activity of Individual Ions: Measuring and Modeling.

Sommario/riassunto

This text explores the connections between different thermodynamic subjects related to fluid systems. Emphasis is placed on the clarification of concepts by returning to the conceptual foundation of thermodynamics and special effort is directed to the use of a simple nomenclature and algebra. The book presents the structural elements of classical thermodynamics of fluid systems, covers the treatment of mixtures, and shows via examples and references both the usefulness and the limitations of classical thermodynamics for the treatment of practical problems related to fluid systems. It also includes diverse selected topics of interest to researchers and advanced students and four practical appendices, including an introduction to material balances and step-by-step procedures for using the Virial EOS and the PRSV EOS for fugacities and the ASOG-KT group method for activity coefficients. The Olivera-Fuentes table of PRSV parameters for more than 800 chemical compounds and the Gmehling-Tochigi tables of ASOG interaction parameters for 43 groups are included.