

1st ed. 2021, Approx. 300 p. 75 illus., 5 illus. in color.

### Printed book

Hardcover

Ca. 89,99 € | Ca. £79.99 | Ca. \$109.99

[<sup>1</sup>]Ca. 96,29 € (D) | Ca. 98,99 € (A) | Ca. CHF 106,50

### eBook

Available from your library or [springer.com/shop](https://springer.com/shop)

### MyCopy [<sup>3</sup>]

Printed eBook for just € | \$ 24.99

[springer.com/mycopy](https://springer.com/mycopy)

Long-Qing Chen

# Thermodynamic Equilibrium and Stability of Materials

- Uses straightforward language to explain the mathematical beauty of thermodynamics
- Offers a step-by-step procedure for computing all thermodynamic properties
- Highlights the two most important concepts: the fundamental equation of thermodynamics and chemical potential

This is a textbook on thermodynamics of materials for junior/senior undergraduate students and first-year graduate students as well as a reference book for researchers who would like to refresh their understanding of thermodynamics. The textbook employs a plain language to explain the thermodynamic concepts and quantities. It embraces the mathematical beauty and rigor of Gibbs thermodynamics through the fundamental equation of thermodynamics from which all thermodynamic properties of a material can be derived. However, a reader with basic first-year undergraduate calculus skills will be able to get through the book without difficulty. One unique feature of this textbook is the descriptions of the step-by-step procedures for computing all the thermodynamic properties from the fundamental equation of thermodynamics and all the thermodynamic energies from a set of common, experimentally measurable thermodynamic properties, supplemented with ample numerical examples. Another unique feature of this textbook is its emphasis on the concept of chemical potential and its applications to phase equilibria in single component systems and binary solutions, chemical reaction equilibria, and lattice and electronic defects in crystals. The concept of chemical potential is introduced at the very beginning of the book together with temperature and pressure. It avoids or minimizes the use of terms such as molar Gibbs free energy, partial molar Gibbs free energy, or Gibbs potential because molar Gibbs free energy or partial molar Gibbs free energy is precisely the chemical potential of a material or a component.

Order online at [springer.com](https://springer.com) / or for the Americas call (toll free) 1-800-SPRINGER / or email us at: [customerservice@springernature.com](mailto:customerservice@springernature.com). / For outside the Americas call +49 (0) 6221-345-4301 / or email us at: [customerservice@springernature.com](mailto:customerservice@springernature.com).

The first € price and the £ and \$ price are net prices, subject to local VAT. Prices indicated with [1] include VAT for books; the €(D) includes 7% for Germany, the €(A) includes 10% for Austria. Prices indicated with [2] include VAT for electronic products; 19% for Germany, 20% for Austria. All prices exclusive of carriage charges. Prices and other details are subject to change without notice. All errors and omissions excepted. [3] No discount for MyCopy.

