Statistical Thermodynamics of Nonequilibrium Processes

By Joel Keizer

Springer. Hardcover. Condition: New. 506 pages. Dimensions: 9.4in. x 6.3in. x 1.4in.This book provides an introduction to the modern statistical theory of nonequilibrium thermodynamics, based on a synthesis of the statistical thermodynamics of Onsager and the kinetic molecular theory of Boltzmann. Topics featured in the initial chapters include an introduction to stochastic processes and Brownian motion, the linear statistical theory of irreversible process, fluctuations in chemical reactions, and the Boltzmann equation. Using the authors canonical representation for the rates of elementary processes, the book develops the statistical thermodynamics of molecular process in a form that is useful for systems close to or far from equilibrium. Molecular noise arising from chemical reactions, electrochemical process, ion channels in membranes, hydrodynamics, and molecular collisions are treated in a unified way. The final chapters focus on the way in which nonlinear molecular mechanisms give rise to steady states, critical points, oscillations, and chaos, including the thermodynamic theory of steady states and its relationship to molecular fluctuations and linear stability. Broadly applicable to dynamical problems in chemistry, physics, and biophysics, the book should be accessible to graduate students, faculty, and other researchers in the physical sciences and engineering. This item ships from multiple locations. Your...

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