

Theory of Unimolecular Reactions provides a comprehensive analysis of the theory of unimolecular reactions, also known to kineticists as the Rice-Marcus or the Rice-Ramsperger-Kassel-Marcus theory, and to those working in mass spectrometry and related fields as the quasi-equilibrium theory or the theory of mass spectra. This book demonstrates how theoretical parameters are related to experimental observables and describes the methods that are used to obtain useful numerical answers. This monograph consists of 11 chapters and begins by explaining the derivation of the expression for the basic rate  $k(E)$ , with emphasis on the unimolecular rate constant, intramolecular energy transfer, and potential energy surfaces in unimolecular reactions. The statistical calculation of unimolecular rate under vibrational potential is also given, along with pertinent degrees of freedom. The remaining chapters explore the energy distribution functions appropriate to each system, the averaging of  $k(E)$ , and the relations between theoretical and experimental parameters. Thermal reactions, chemical activation systems, and the theory of mass spectra are examined. The last chapter is devoted to the transition state and its ambiguities. This text will be of interest to gas kineticists, mass spectrometrists, and students and researchers working in the field of physical chemistry.

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