doi:10.1351/goldbook.R05391

Rice–Ramsperger–Kassel–Marcus (RRKM) theory

An improved form of Rice–Ramsperger–Kassel (RRK) theory in which account is taken of the way in which the various normal-mode vibrations and rotations contribute to reaction, and allowance is made for the zero-point energies. In this theory the energy ε^{*} in an energized molecule is classified as either active, $\varepsilon^{*\mathrm{active}}$, or inactive, $\varepsilon^{*\mathrm{inactive}}$. The rate depends upon $\frac{P(\varepsilon^{*\mathrm{active}})}{N(\varepsilon^{*})}$, where $N(\varepsilon^{*})$ is the density of states having energy between ε^{*} and $\varepsilon^{*} + \mathrm{d}\varepsilon^{*}$, and $P(\varepsilon^{*\mathrm{active}})$ is the sum of the active quantum states of the activated complex. This extension of RRK theory brings it in line with transition-state theory.

Source:
PAC, 1996, *68*, 149 *(A glossary of terms used in chemical kinetics, including reaction dynamics (IUPAC Recommendations 1996))* on page 186