Landau–Zener model

Within the Born–Oppenheimer approximation, a semi-classical model for the probability, P, of hopping from one electronic state to another of the same or different *multiplicity*

$$P = \exp\left(- \frac{4\,\pi^2\,\varepsilon_{12}^{\,2}}{h\,v\,\mid s_1 - s_2 \mid} \right)$$

where ε_{12} is the potential energy gap between the two electronic states at a surface crossing point, $\mid s_1 - s_2 \mid$ is the difference in slopes between the intersecting potential energy curves at this point and v is the nuclear relative velocity with which the system passes the point of closest approach.

Note:

The original formalism only considered states of the same spin multiplicity.

Source:

PAC, 2007, *79*, 293 *(Glossary of terms used in photochemistry, 3rd edition (IUPAC Recommendations 2006))* on page 362