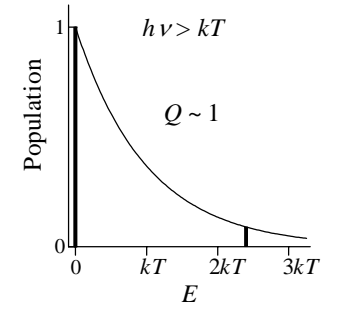
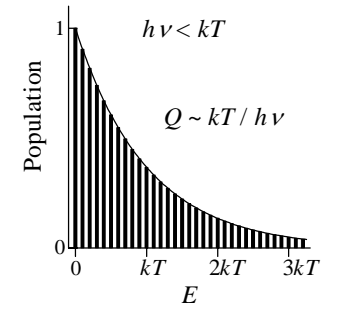


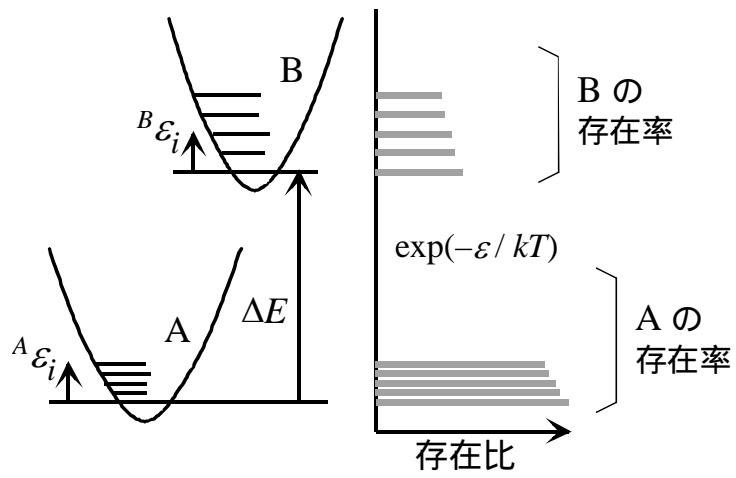
$$\frac{n(v=1)}{n(v=0)} = \frac{\sum_{J'} g(J') \exp\left(-\frac{\varepsilon_{J'} + \Delta E}{kT}\right)}{\sum_{J''} g(J'') \exp\left(-\frac{\varepsilon_{J''}}{kT}\right)} = \frac{Q(v=1)}{Q(v=0)}$$

$$= \frac{\sum_{J'} g(J') \exp\left(-\frac{\varepsilon_{J'}}{kT}\right)}{\sum_{J''} g(J'') \exp\left(-\frac{\varepsilon_{J''}}{kT}\right)} \exp\left(-\frac{\Delta E}{kT}\right) = \frac{Q'_{rot}}{Q''_{rot}} \exp\left(-\frac{\Delta E}{kT}\right)$$

CO の振動回転準位分布



振動分配関数



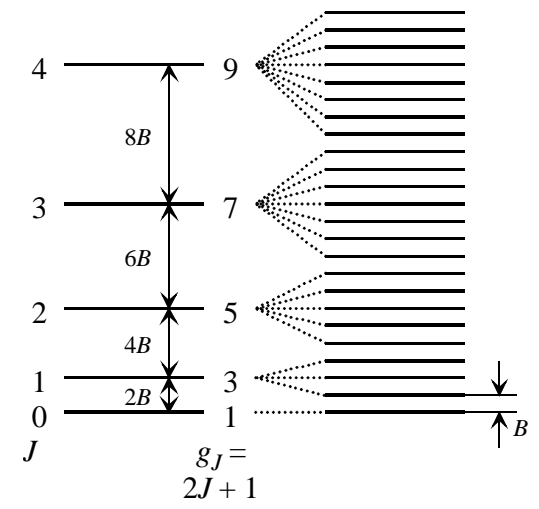
$$K_c = \frac{[B]_e}{[A]_e} = \frac{\sum_i^B g_i \exp\left(-\frac{B \varepsilon_i + \Delta E}{kT}\right)}{\sum_i^A g_i \exp\left(-\frac{A \varepsilon_i}{kT}\right)}$$

$$= \frac{\sum_i^B g_i \exp\left(-\frac{B \varepsilon_i}{kT}\right)}{\sum_i^A g_i \exp\left(-\frac{A \varepsilon_i}{kT}\right)} \exp\left(-\frac{\Delta E}{kT}\right)$$

$$K_c = \frac{Q_B}{Q_A} \exp\left(-\frac{\Delta E}{kT}\right) \quad (7.1)$$

$$Q = g_{elec} Q_{vib} Q_{rot} \quad (7.2)$$

分子内準位分布と化学平衡



二次元回転の状態密度 ~ 1/B