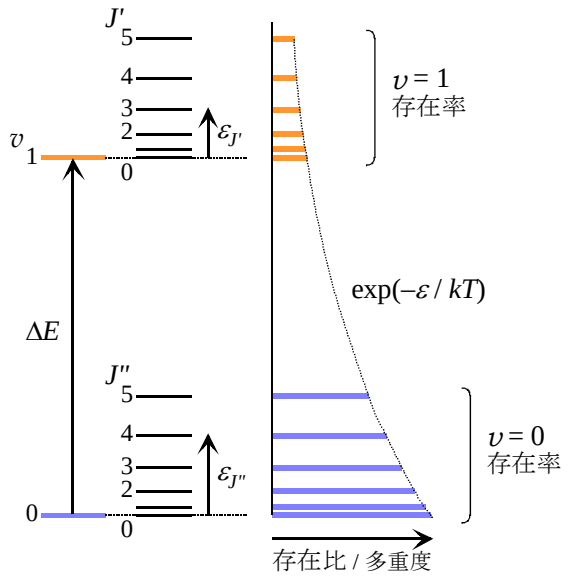
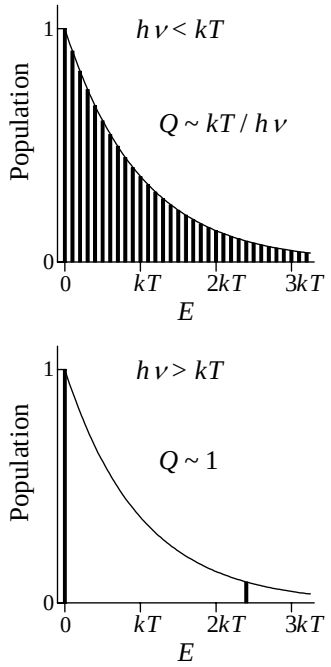


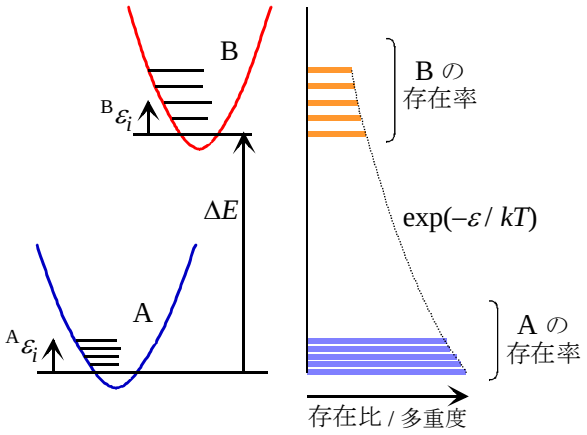
CO の振動回転準位分布

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

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



振動分配関数



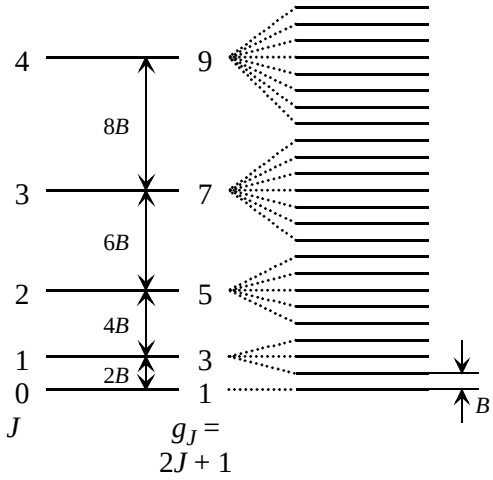
分子内準位分布と化学平衡

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

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

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

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



二次元回転の状態密度 ~ 1 / B