Home work week 6

1. Last time we obtained the equilibrium constant for a uni-molecular reaction in the gas phase. Now try the same for the unimolecular dissociation:

$$\mathrm{A} \rightleftarrows 2\mathrm{B} \tag{1}$$

   in the gas phase.

2. Continue the derivation of the Eyring equation for a system with one degree of freedom. Obviously this degree is then also the reaction coordinate. Assume that the potential energy surface near the reactant minimum can be considered harmonic: $V(q) = \frac{1}{2}\omega^2 m(q - q_A)^2$, with m the mass, and ω the (angular) frequency ($\omega = 2\pi\nu$), and q_A the value of the generalized coordinate q at the reactant conformation. As a reminder, the key assumptions was that there is no back-reaction from product to reactant.