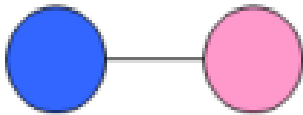


# Harmonic oscillator transition dipole

$$\mu(Q) = \mu_0 + \left( \frac{\partial \mu}{\partial Q} \right) Q + \dots$$



$$\mu < \mu_0$$



$$\mu_0$$



$$\mu > \mu_0$$

# Harmonic oscillator transition dipole

Calculate the transition dipole moment for a transition from  $v = 0$  to  $v = 1$  for a harmonic oscillator with a dipole derivative of  $9.5 \text{ Debye/\AA}$ . Assume that the reduced mass is  $0.95 \text{ amu}$  and the wave number is  $3900 \text{ cm}^{-1}$ .