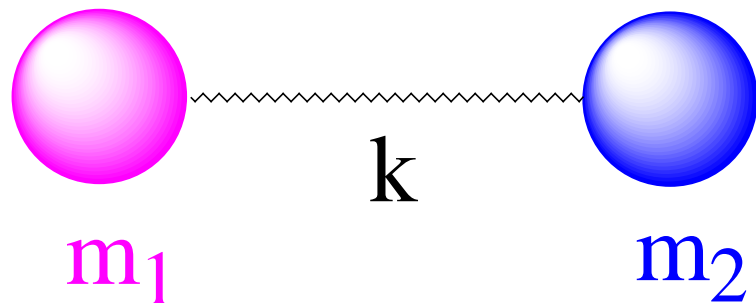


Isotope effects are analyzed within the harmonic approximation.



Reduced mass

$$\mu = \frac{m_1 m_2}{m_1 + m_2}$$

The wave number ratio for isotopically labeled species is proportional to the inverse square root of the reduced mass.

$$\frac{\tilde{\nu}_2}{\tilde{\nu}_1} = \sqrt{\frac{\mu_1}{\mu_2}}$$