Grahms Law

Relates

- velocity (v) and mass (m) at constant temp. in a vacuum
- based on Kinetic energy (KE)

$$KE_1 = KE_2$$

Kinetic Energy

$$KE = \frac{1}{2} mv^2$$

m = molar mass
v = velocity

Direct

relationship between velocity + the rate of diffusion.
i.e. lighter particles travel faster

Solve:

$$\frac{1}{2} m_1 v_1^2 = \frac{1}{2} m_2 v_2^2 \quad \text{for: } \frac{V_1}{V_2}$$

$$m_1 v_1^2 = m_2 v_2^2$$

$$\frac{v_1^2}{v_2^2} = \frac{m_2}{m_1}$$

Formula

$$\boxed{\frac{V_1}{V_2} = \sqrt{\frac{m_2}{m_1}}}$$