

Effusion of Gases

$$\mu_{rms} = \sqrt{\frac{3 RT}{M_m}}$$

$$\frac{Rate_{Gas A}}{Rate_{Gas B}} = \sqrt{\frac{M_{mB}}{M_{mA}}}$$

1. Calculate the rms speed of nitrogen molecules, N_2 , at $22.0\text{ }^\circ\text{C}$. Report the speed in meters.
2. What is the molar mass of a gas that diffuses 1.92 times slower than Ne gas?
3. A given volume of O_2 gas takes 68.2 seconds to diffuse. Another gas took 86.3 seconds to diffuse under the same conditions. Calculate the molar mass of the gas?
4. A sample of Ne gas diffuses 15.5 cm in 3.4 minutes. How long would it take for Cl_2 gas to diffuse the same distance?