

Name:

Period:

Seat#:

**Effusion**

$$\frac{\text{Rate of Effusion of Gas 1}}{\text{Rate of Effusion of Gas 2}} = \frac{\sqrt{M_2}}{\sqrt{M_1}}; M = \text{Molar mass}$$

**Diffusion**

$$\frac{\text{Distance traveled of Gas 1}}{\text{Distance traveled of Gas 2}} = \frac{\sqrt{M_2}}{\sqrt{M_1}}; M = \text{Molar mass}$$

**Directions:**

Solve the following problems. Assume all number are 3 significant figures. Remember to show your work!

- 1) Under the same conditions of temperature and pressure, how many times faster will hydrogen effuse compared to carbon dioxide? 4.69 times faster
- 2) If the carbon dioxide in Problem 1 takes 32 sec to effuse, how long will the hydrogen take? 6.8 sec
- 3) What is the relative rate of diffusion of NH<sub>3</sub> compared to He? Does NH<sub>3</sub> effuse faster or slower than He? 0.485 times
- 4) If the He in Problem 3 takes 20 sec to effuse, how long will the NH<sub>3</sub> take? 40 sec
- 5) An unknown gas diffuses 0.25 times as fast as He. What is the molecular mass of the unknown gas? 64 g/mol
- 6) Find the molar mass of a gas that diffuses about 4.45 times faster than argon gas. 2.01 g/mol