GRAHAM'S LAW OF EFFUSION

Name _____

Graham's Law says that a gas will effuse at a rate that is inversely proportional to the square root of its molecular mass, MM. Expressed mathematically:

$$\frac{rate_1}{rate_2} = \sqrt{\frac{MM_2}{MM_1}}$$

Solve the following problems.

1. Under the same conditions of temperature and pressure, how many times faster will hydrogen effuse compared to carbon dioxide?

   _____

2. If the carbon dioxide in Problem 1 takes 32 sec to effuse, how long will the hydrogen take?

   _____

3. What is the relative rate of diffusion of NH_3 compared to He? Does NH_3 effuse faster or slower than He?

   _____

4. If the He in Problem 3 takes 20 sec to effuse, how long will NH_3 take?

   _____

5. An unknown gas diffuses 0.25 times as fast as He. What is the molecular mass of the unknown gas?

   _____