Diffusion Homework Sheet

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 travels at a rate of $3.2 \times 10^2$ m/s, what would be the rate of the hydrogen gas?

3) An unknown gas diffuses twice as fast as chlorine. What is the molecular mass of the unknown gas?

4) What is the relative rate of diffusion of NH$_3$ compared to He? Does NH$_3$ effuse faster or slower than He?

5) An unknown gas effuses at one-half the speed of oxygen. What is the molar mass of the unknown gas? It is either HBr or HI. Which gas is it?

6) An unknown gas effuses at a speed of one-quarter of that of helium. What is the molar mass of the unknown gas? It is either sulfur dioxide or sulfur trioxide. Which gas is it?

7) Oxygen molecules have an average speed of $4.80 \times 10^2$ m/s at 25°C. What is the average speed of H$_2$ molecules at the same temperature?