Graham's and Dalton's Law Problems

1. A 10.0L of a mixture of gases contains CO_2 at 300mmHg, Ar at 100mmHg, and He at 300mmHg, with T = 295K.

   a) What is the total pressure in the tank?

   b) If N_2 gas is added to the tank at constant T, and the total pressure in the tank is now 890mmHg, what is the partial pressure of the nitrogen gas?

2. A 44.0L tank holds hydrogen gas at a pressure of 127kPa. A second tank with a volume of 22.0L contains a sample of nitrogen gas at a pressure of 89kPa.

   a) If the nitrogen gas is transferred into the 44.0L tank at constant T, what would its new pressure be in the tank?

   b) What is the new <u>total pressure</u> in the 44.0L tank container?

3. A sample of oxygen gas is collected in the lab by bubbling it through water at 20.0°C and collecting it in a gas collecting tube. The air pressure in the room is 99.1kPa and the air temperature is 20.0°C.

   a) What TWO gases are in the gas collecting tube?

   b) The vapor pressure of water at 20.0°C is 17.5mmHg. What is this pressure in kPa?

   c) What is the pressure of the oxygen gas?

   d) If the gas collecting tube has a volume of 50.0mL, how many moles of oxygen gas are in the tube? How many grams?

4. What is the difference between effusion and diffusion?

5. Rank the following gases from 1 to 4 distinguishing would effuse through an opening the fastest, with 1 = fastest:

   ____H_2S ____CH_4 ____O_2 ____Ar