Mole and Avogadro Problems

1- What is the mass of 245 L of silicon tetrafluoride gas at STP conditions?

2- What mass of $C_2H_4(g)$ is present in 675 litres of the gas at RTP conditions?

3- What is the mass of 7.55×10^{25} molecules of $C_5H_{10}(g)$?

4- A container holds 1055 g of fluorine gas at 35°C and 175 kPa. What mass of CS_2 gas could it hold at the same temperature and pressure?

5- A balloon holds 345 g of nitrogen gas at RTP conditions. An identical balloon (same temperature, volume and pressure) holds CH_4 gas. What is the mass of the gas in the second balloon? What is the volume of the balloon?

6- A cylinder contains 45.6 moles of H_2S gas. An identical cylinder is full of either hydrogen gas or hydrogen cyanide gas. There is 1232 g of gas in the second cylinder. Which gas does it contain?

7- A blimp contains 8.00×10^4 grams of helium. What mass of argon would fill it under identical conditions? What mass of oxygen or carbon monoxide would it hold under the same conditions?

8- At room temperature and pressure, a cylinder holds 425 grams of gas A. Under identical conditions, it holds 275 grams of gas B. How do the molecules of the two gases compare in mass?

9- A container is filled with HI gas. By what ratio would the mass of contained gas vary if it was filled with xenon? With propane (C_3H_8)?

10- A plastic jug holds 8.0 g of carbon monoxide at room conditions. Under identical conditions, how much hydrogen would it hold? Nitrogen trifluoride? Krypton?

11- A sphere holds 68 g of hydrogen sulphide. Under identical conditions, it holds 76 grams of an unidentified gas. A chemist has narrowed down the possible identity of the gas to argon, oxygen, fluorine and nitrogen. Which is it?

12- A tank contains 1740 g of butane (C_4H_{10}). Under identical conditions, it holds 2700 g of another gas. This unknown gas is a combination of element X (atomic mass 15) and element Y (atomic mass 60). Determine the formula of the unknown gas (X is more metallic than Y).