

1. At STP the mass of 1.00 L of gas is 1.89 g. What mass of the gas will occupy 1.00 L at 200 °C and a pressure of 1.25 atmospheres?
2. What mass of hydrogen chloride is needed to exert a pressure of 0.240 atmosphere in a 250 mL container at 37 °C?
3. The density of a gas at STP is 1.62 g L<sup>-1</sup>. What is the density at 302 °C and a pressure of 0.950 atmospheres?
4. A gaseous hydrocarbon has the mass of 0.185 g and occupies 110 cm<sup>3</sup> at 26 °C and 743 mm Hg. What is the molar mass of this compound?
5. A 2.650 g sample of a gas occupies a volume of 428 ml at 742.3 mm Hg and 24.3 °C. Analysis of this compound shows it to be 15.5% carbon, 23.0% chlorine and 61.5% fluorine by mass. What is the molecular formula of this compound?
6. A glass vessel empty measures 56.1035 grams. When filled with Freon-113 the mass is 264.9231 g. Freon-113, a liquid, has a density of 1.576 g/cm<sup>3</sup>. The same container filled with acetylene gas at 749.3 mm Hg and 20.02 °C has the mass of 56.2445 grams. Acetylene is 92.24 % carbon and 7.76% hydrogen. What is the molecular formula of acetylene?
7. A volatile liquid was found to have the composition of 62.04% carbon, 10.41% hydrogen and 27.55% oxygen by mass. At 100.0 °C and 1.00 atm pressure 440 ml of the gaseous compound had a mass of 1.673 g. What is the molecular formula?