Gases Part II Worksheet

1. What is the mass, in grams, of 125 mL of CO2 at STP? 0.246 grams of CO2

2. What is the density at STP of methane gas (CH4), in grams per liter? .714 grams per liter

3. A chemical reaction produced 2.50 moles of nitrogen gas. What volume, in liters, does this gas sample occupy at STP? 56 liters

3. What is the molar mass of a gas that has a density of 0.840 g/L at STP? 18.8 g/mol

4. A 0.215 g gas sample occupies a volume of 225 mL at 27°C and 740. mm Hg. What is the molar mass of this gas?

24.2 grams per mole

5. What volume, in liters, is occupied by 0.750 mol of hydrogen gas at STP? 16.8 L

6. What is the mass, in grams, of 72.5 L of NH3 at STP? 55.0 g

7. What is the density at STP of hydrogen sulfide gas (H2S), in grams per liter? 1.52 g/L

8. Find the molar mass of a gas that has a density of 1.15 g/L at STP. 25.8 g/mol

9. What is the molar mass of a 0.625 g gas sample that has a volume of 165 mL at STP? 84.8 g/mol

10. A 0.625 g gas sample occupies a volume of 320. mL at -23°C and 700. mm Hg. What is the molar mass of this gas? 43.5 g/mol

11. What pressure in atmospheres is exerted by 1.50 mol NH3 in a 3.75 L container at 27°C? 9.85 atm

12. What mass of nitrogen (N2), in grams, is contained in a 7.25 L tank at 37° C and 2.50 atm pressure? 19.9 g

13. What is the volume of 8.15 moles of SO2 gas at 28.5°C and 0.985 atm? 205 L

14. What is the temperature of 1.50 mol argon gas that is contained in a 500.0 mL flask at 15.8 atm? 64.1 K

16. How many moles of nitrogen gas are present in a one-liter flask if the pressure is 1520 mm Hg and the temperature is 26.7°C? 0.0813 moles

17. What is the molar mass of an unknown gas if a 1.25 g sample occupies 1.00 L at 26.3° C and 0.990 atm?

31.0 g/mole

18. If 958 mL of an unknown gas has a mass of 2.58 g at 22°C and 750. mm Hg, what is its molar mass? 66.1 g/mol

19. Carbon disulfide liquid (CS2) undergoes combustion according to the following: CS2 (g) + 3O2 (g) -> C02 (g) + 2 S02 (g). Assuming that all volume measurements are made at the same temperature and pressure, what volume, in liters, of each product will be produced if 4.25 L of O2 are consumed? 1.42 L C02 and 2.83 L SO2

20. Based on the equation in the previous problem. What mass, in grams, of CS2 (g) would be required to produce 3.50 L of SO2 (g) at STP? 5.95 g CS2

21. Butane gas (C4H10) undergoes combustion to form carbon dioxide gas and water vapor. If 750. mL of C4H10 react, what mass, in grains, of CO2 will be produced at STP? 5.89 g CO2

22. Potassium chlorate decomposes according to the following:

2KC103(s) -> 2KCl (s) + 302 (g). If 5.00 g of KCIO3 decompose, what volume of oxygen, in liters, would be produced at STP? 1.37 L 02

23. Phosphoric acid (H3P04) reacts with magnesium carbonate according to the following unbalanced equation:

H3P04(aq) + MgCO3(s) -> Mg3(P04)2(s) + C02(g) + H2O(g). How many liters of CO2 at 20°C and 715 mm Hg could be produced if 30.0 g of H3P04 react? 11.7 L CO2

24. Solid calcium carbide (CaC2) reacts with water to produce aqueous calcium hydroxide and acetylene gas (C2H2). What volume of C2H2 (in liters), collected over water at 27°C and 740.5 mm Hg. could be produced if 45.0 g of CaC2 react?

18.4 L C2H2