Chemistry 2202 - Unit 1 Stoichiometry

Worksheet #8   Percent Composition, Empirical & Molecular Formulas

1.   Calculate the percent composition by mass of each of the following compounds.
      a) CH_3COOH b) $Ca(NO_3)_2$ c) $(NH_4)_2SO_4$

2.   Calculate the percentage of nitrogen, by mass, in each of the following compounds.
      a) N_2O_5 b) NH_4NO_2

3.   What is the percentage of water in copper (II) sulfate pentahydrate?

4.   Calculate the empirical formula for compounds with the following percent compositions:
      a)   59.4% lead, 40.6% chlorine
      b)   50.1% sulfur, 49.9% oxygen
      c)   44.9% potassium, 18.4% sulfur, 36.7% oxygen
      d)   22.04% carbon, 4.63% hydrogen, 73.3% bromine

5.   A compound of empirical formula P_2O_3 has a molar mass of 220 g/mol. What is its molecular formula?

6.   Determine the molecular formula of a compound containing 85.7% carbon and 14.3 % hydrogen by mass. The molar mass of the compound is 84 g/mol.

7.   Aspirin has a molar mass of 180 g/mol. Determine its molecular formula if it contains 60.0% carbon, 4.50% hydrogen, and 35.5 % oxygen.

8.   When 5.742 g of hydrated magnesium sulfate (Epsom salts) is heated until all the water has been released, 2.801 g of anhydrous magnesium sulfate remains. What is the formula of the hydrated magnesium sulfate?

9.   When 3.76 g of hydrated iron (III) sulfate was heated to drive off all the water, 2.77 g of anhydrous salt remained. What is the formula of the hydrated salt?

10.   When 8.68 g of hydrated lithium chloride was heated until all the water was released, 3.21 g of anhydrous salt remained. What is the formula of the hydrated salt?

11.   When 12.8 g of hydrated cobalt (II) chloride was heated to drive off all the water, 6.99 g of anhydrous salt remained. What is the formula of the hydrated salt?

12.   When 7.59 g of an oxide of manganese is heated, 3.76 g of manganese metal is obtained. what is the empirical formula of this compound?

13.   When 23.5 g of an oxide of tin is heated, 18.5 g of tin metal is recovered. What is the empirical formula of the compound?