1) Determine the empirical formula and the molecular formula for each of the following:

a) a compound made from 5.94% hydrogen and 94.06% oxygen with a molar mass of 34.02 g/mol
b) a compound made from 80.34% zinc and 19.66% oxygen with a molar mass of 81.39 g/mol
c) a compound made from 35.18% iron, 44.66% chlorine and 20.16% oxygen and a molar mass of 158.75 g/mol
d) a compound made from 26.19% nitrogen 7.55% hydrogen and 66.26% chlorine with a molar mass of 53.50 g/mol

2) Determine the empirical formula for each of the following:

a) a compound made from 32.86% potassium and 67.14% bromine
b) a compound made from 63.50% silver, nitrogen, and 28.25% oxygen
c) a compound made from calcium, 2.72% hydrogen and 43.18% oxygen
d) a compound made from 2.06% hydrogen, 32.69% sulfur, and oxygen

3) Calculate the empirical formula of each compound given:

a) 63.6% N, 36.4% O
b) 46.7% N, 53.3% O
c) 25.9% N, 74.1% O
d) 43.4% Na, 11.3% C, 45.3% O
e) 18.8% Na, 29.0% C, 52.3% O
f) 72.02% Mn, 27.98% O

4) Calculate the empirical formula of each compound given:

a) 64.1% Cu, 35.9% Cl
b) 47.2% Cu, 52.8% Cl
c) 51.9% Cr, 48.1% S
d) 55.3% K, 14.6% P, 30.1% O
e) 38.9% Ba, 29.4% Cr, 31.7% O
f) 3.99% P, 82.3% Br, 13.7% Cl

5) A sample of tin having a mass of 3.996 g was oxidized and found to have combined with 1.077 g of oxygen. What is the empirical formula of the oxide of tin?

6) Hydroquinone is an organic compound commonly used as a photographic developer. It has a molar mass of 110.1 g/mol and a composition of 65.45% C, 5.45% hydrogen and the balance is oxygen. What is the MOLECULAR formula of hydroquinone.

7) Calculate the percent composition and determine the empirical and molecular formula for the nitrogen-oxygen compound that results when 12.04 g of nitrogen is reacted with enough oxygen to produce 39.54 g of product. The molar mass of the product is 92.02 g/mol

8) A sample of an unknown compound was analyzed and found to contain 90.3 g of carbon, 15.2 g of hydrogen and 60.1 g of oxygen. The molar mass of the unknown compound was found to be 396.2 g/mol. What is the molecular formula of the compound?

9) What is the empirical formula of a sample compound containing 0.4806 g of carbon, 0.0759 g of hydrogen, 0.2134 g of oxygen and 0.0935 g of nitrogen?

10) A sample of a pure compound is made up of 0.7722 g carbon, 0.0867 g hydrogen, and 2.282 g of bromine, what is the empirical formula of the compound? What is the molecular formula given that the molar mass is 1773.05 g/mol?

11) The compound XYZ_3 has a molar mass of 100.09 g/mol and a percent composition of 40.04% X, 12.00% Y and 47.96% Z. What is the compound?

12) The compound $X_2(YZ_3)_3$ has a molar mass of 282.23 g/mol and is made up of 19.12% X, 29.86% Y, and the rest is Z. What is the compound?