**COSTAATT**

**CHEM 111– Concepts in Chemistry I**

**Lesson 5**

**Homework**

1. How many moles are in 2.3 grams of phosphorus?

2. How many grams are in 11.9 moles of chromium?

3. How many grams are in 0.02 moles of beryllium iodide, BeI2?

4. How many grams are there in 3.4 x 1024 molecules of NH3?

5. How many grams are there in 7.5 x 1023 molecules of H2SO4?

6. How many moles are represented by each of the following:

(RAMs: H = 1; O = 16; S = 32; Fe = 56; Cu = 64)

(a) 50g of copper(II) sulphate crystals, CuSO4.5H2O

(b) 1 tonne of iron, Fe (1 tonne is 1000 kg)

(c) 0.032 g of sulphur dioxide, SO2.

7. Find the percentage of the named substance in each of the following:

(RAMs: H = 1; C = 12; O = 16; Mg = 24; S = 32)

(a) Carbon in propane, C3H8

(b) Water in magnesium sulphate crystals, MgSO4.7H2O

8. (RAMs: H = 1; C = 12; N = 14; O = 16; Na = 23; S = 32; K = 39; Br = 80)

Find the empirical formulae of each of the following compounds which contained:

(a) 5.85g K; 2.10g N; 4.80g O

(b) 3.22g Na; 4.48g S; 3.36g O

(c) 22.0% C; 4.6% H; 73.4% Br (by mass)

9. Determine the *empirical formula* for each compound described below.

(i) Glucose contains 40.0% carbon, 6.7% hydrogen, and 53.3% oxygen by mass.

(ii) Phosphoric acid is found in some soft drinks. A sample of phosphoric acid contains

0.3086 g of hydrogen, 3.161 g of phosphorus, and 6.531 g of oxygen.

10. Determine the *molecular formula* for each compound described below.

(i) A compound has an empirical formula of C2H3O and a molar mass of 172 g/mol.

(ii) Nicotine is 74.1% carbon, 8.6% hydrogen, and 17.3% nitrogen by mass. It’s molar

mass is about 160 g/mol.

(iii) Epinephrine (adrenaline) is a hormone secreted into the bloodstream in times of

danger and stress. It is 59.0% carbon, 7.1% hydrogen, 26.2% oxygen, and 7.7%

nitrogen by mass. Its molar mass is about 180 g/mol.