**COSTAATT**

**CHEM092 – Introduction to Concepts in Chemistry II**

**Lesson 3**

**Worksheet – Calculations based on chemical equations.**

(1) Titanium is manufactured by heating titanium (IV) chloride with sodium.

TiCl4(g) + 4Na(l) → Ti(s) + 4NaCl(s)

What mass of sodium is required to produce 1 tonne of titanium?

(RAMs: Na = 23; Ti = 48)

(2) 2.67g of aluminium chloride was dissolved in water and an excess of silver nitrate solution was added to give a precipitate of silver chloride.

AlCl3(aq) + 3AgNO3(aq) → Al(NO3)3(aq) + 3AgCl(s)

What mass of silver chloride precipitate would be formed?

(RAMs: Al = 27; Cl = 35.5; Ag = 108)

(3) Copper(II) sulphate crystals, CuSO4.5H2O, can be made by heating copper (II) oxide with dilute sulphuric acid and then crystallising the solution formed. Calculate the maximum mass of crystals that could be made from 4.00g of copper (II) oxide using an excess of sulphuric acid.

CuO(s) + H2SO4(aq) → CuSO4(aq) + H2O(l)

CuSO4(aq) + 5H2O(l) → CuSO4.5H2O(s)

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