SANSKAR SCHOOL
IBDP YEAR I
SUBJECT - CHEMISTRY
Assignment 1

? Test yourself

40 a What mass of sodium sulfate (Na_2SO_4) must be used to make up $250\,cm^3$ of a $0.100\,mol\,dm^{-3}$ solution?

b What is the concentration of sodium ions in the solution in a?

41 Work out the numbers of moles of solute present in the following solutions:

a $20.0\,cm^3$ of $0.220\,mol\,dm^{-3}$ $NaOH(aq)$

b $27.8\,cm^3$ of $0.0840\,mol\,dm^{-3}$ $HCl(aq)$

c $540\,cm^3$ of $0.0200\,mol\,dm^{-3}$ $KMnO_4(aq)$

42 If $29.70\,cm^3$ of sulfuric acid of concentration $0.2000\,mol\,dm^{-3}$ is required for neutralisation of $25.00\,cm^3$ of potassium hydroxide solution, calculate the concentration of the potassium hydroxide solution.

$$2KOH(aq) + H_2SO_4(aq) \rightarrow K_2SO_4(aq) + 2H_2O(l)$$

43 Calcium carbonate is reacted with $50.0\,cm^3$ of $0.500\,mol\,dm^{-3}$ hydrochloric acid.

$$CaCO_3(s) + 2HCl(aq) \rightarrow CaCl_2(aq) + CO_2(g) + H_2O(l)$$

a What mass of calcium carbonate is required for an exact reaction?

b What volume of carbon dioxide, measured at STP, will be produced?

44 What volume (in cm^3) of $0.0100\,mol\,dm^{-3}$ barium chloride must be reacted with excess sodium sulfate to produce $0.100\,g$ of barium sulfate?

$$BaCl_2(aq) + Na_2SO_4(aq) \rightarrow BaSO_4(s) + 2NaCl(aq)$$

45 If $0.100\,g$ of magnesium is reacted with $25.00\,cm^3$ of $0.200\,mol\,dm^{-3}$ hydrochloric acid, calculate the volume of hydrogen gas produced at STP.

$$Mg(s) + 2HCl(aq) \rightarrow MgCl_2(aq) + H_2(g)$$