Year 12 Chemistry

Quick Quiz: Concentrations for samples

1. To determine the concentration of Al^{3+} in the soil of a paddock, a 5.6 g sample of soil is dissolved in 150 mL of H_2SO_4 solution. The concentration of Al^{3+} in this solution is determined by AAS to be 3.2 ppb.

   Calculate the concentration of Al^{3+} in the paddock soil, in micrograms per gram.

2. To determine the percentage mass of $Mg(OH)_2$ in some antacid tablets, two tablets of total mass 2.4 g are crushed and dissolved in 100 mL of 1.0 mol L^{-1} HCl.

   $2HCl + Mg(OH)_2 \rightarrow H_2O + MgCl_2$

   The concentration of HCl is then determined by AAS to be 0.79 mol L^{-1}.

   (a) Calculate the moles of HCl present before the reaction.

   (b) Calculate the moles of HCl remaining after the reaction.

   (c) Hence calculate the moles of HCl that were used up in the reaction.

   (d) Use the reacting mole ratio to determine the number of moles of $Mg(OH)_2$ in the two tablets.

   (e) Hence determine the mass of $Mg(OH)_2$ in the two tablets.

   (f) Calculate %w/w $Mg(OH)_2$ in the antacid tablets.