Marks

Question 26 (5 marks)

Water can be described as either 'hard' or 'soft'.

(a) Describe a test you have used to determine whether a given sample of water is 'hard' or 'soft'. **2**

hard water contains Ca^{2+} ions. So to test for these ions a flame test can be used as Ca^{2+} ions are green in flame. So take a platinum wire (cleaned) and dip in the water, then put in flame. If green flame then its hard water.

(b) A sample of hard water contains 6×10^{-4} mol L^{-1} of magnesium carbonate. **3**

Calculate the mass, in mg, of magnesium carbonate in 150 mL of this sample.

6×10^{-4} moles in every litre

∴ theres $0.15 \times 6 \times 10^{-4}$ moles in 150ml

$= 9 \times 10^{-5}$ moles in 150ml

mm $Mg(CO_3)_2 = 144.33$

∴ mass of $Mg(CO_3)_2$ in 150ml of $H_2O = 9 \times 10^{-5} \times 144.33 = 0.012987$ gms

∴ in mg $= 1.169 \times 10^{-9} = 1.17 \times 10^{-9}$ mg of $Mg(CO_3)_2$ in 150ml.