

Revision Gravimetric Analysis

Name:

- 1) Salt is to be mined from a geological deposit of sedimentary rock. A small sample of the rock was supplied and tested for the percentage of salt, by mass, contained in the sample.
A silver nitrate solution was used to precipitate the chloride ions found in a 4.50g sample of the rock .

a) Write a chemical equation for the precipitation reaction.



b) If the sample was found to contain 61.2% chloride, by mass, what was the mass of the precipitate obtained from the investigation?

Step 1 find the mass of Cl in the sample.

$$4.50 \times 0.612 = 2.754 \text{ g}$$

Step 2 find the mol of Cl

$$2.754 / 35.5 = 7.76 \times 10^{-2}$$

Step 3 find the mol of AgCl

$$n_{\text{Cl}} = n_{\text{AgCl}} = 7.76 \times 10^{-2}$$

Step 4 find the mass of the precipitate

$$\text{Mass} = \text{mol} \times \text{formula mass}_{\text{AgCl}} = 7.76 \times 10^{-2} \times 143.4 = 11.1 \text{ g}$$

- 2) A rock contains an ore of aluminium sulphate ($\text{Al}_2(\text{SO}_4)_3$). A 3.480 g sample of the ore is crushed and the sulphate precipitated as barium sulphate $\text{BaSO}_4(\text{s})$. If 2.65 g of barium sulphate is obtained what is the percentage by mass of sulphur in the ore given to the right number of significant figures?

Step 1 find the mol of barium sulphate

$$n_{\text{barium sulphate}} = 2.65 / 233.4 = 1.14 \times 10^{-2}$$

Step 2 find the mol of sulphur

$$n_{\text{barium sulphate}} = n_{\text{sulphur}} = 1.14 \times 10^{-2}$$

Step 3 find the mass of sulphur

$$\text{Mass}_{(\text{sulphur})} = 1.14 \times 10^{-2} \times 32.1 = 0.366\text{g}$$

Step 4 find the percentage by mass of sulphur in the ore

$$(0.366 / 3.48) \times 100 = 10.5\%$$