

Question 31 (6 marks)

- (a) A student collected a 250 mL sample of water from a local dam for analysis. The data collected are shown in the table.

Mass of filter paper	0.23 g	
Mass of filter paper and solid	0.47 g	Δ 0.24 g
Mass of evaporating basin	43.53 g	
Mass of basin and solid remaining	44.67 g	Δ 1.14 g

- (i) The water was filtered and the filtrate evaporated to dryness. 2

Calculate the percentage of the total dissolved solids in the dam sample.

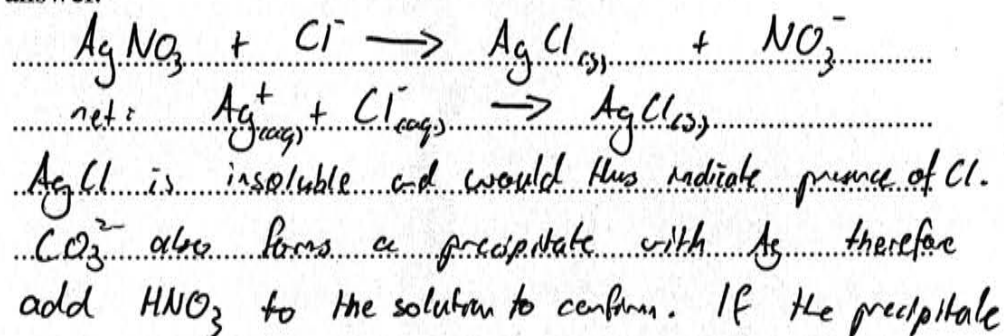
dissolved solids would pass through filter paper.

$$\text{TDS} = \frac{1.14 \text{ g}}{0.250 \text{ L}} = \frac{4.56 \text{ g}}{1.0} \text{ L}^{-1}$$

$$\% \text{ TDS} = 0.456$$

- (ii) It is suspected that the water in the dam has a high concentration of chloride ions. 2

Describe a chemical test that could be carried out on the water sample to determine the presence of chloride ions. Include an equation in your answer.



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dissolves, then it is CO₃²⁻, but if it remains the Cl⁻ presence is confirmed.

Question 31 (continued)

- (b) Name an ion other than chloride that commonly pollutes waterways, and identify its source and the effect of its presence on water quality. 2

~~Calcium ions (Ca^{2+}) are often found in water ways due to dissolving of limestone (CaCO_3). A high presence of Ca^{2+} causes water to be hard and can prevent soaps from lathering.~~

End of Question 31

A common pollutant in waterways is SO_4^{2-} . This is sourced from farm run-offs as fertilisers contain SO_4^{2-} . This reacts with water to form sulphuric acid which can reduce the pH of water ways ~~making it require~~ killing aquatic life and ~~making it~~ ~~impossible~~ difficult to treat.