

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
Mass of evaporating basin	43.53 g
Mass of basin and solid remaining	44.67 g

$$\text{Solid} = 0.24$$

$$\text{Solid} = 1.14$$

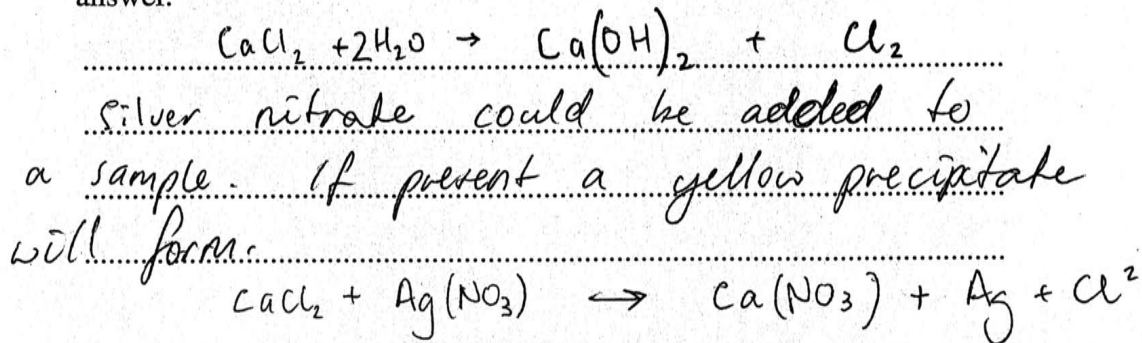
- (i) The water was filtered and the filtrate evaporated to dryness. 2

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

$$\begin{array}{l} \dots\dots\dots 0.24 \text{ g in } 250 \text{ mL} \dots\dots\dots 1.14 \text{ in } 250 \text{ mL} \dots\dots\dots \\ \dots\dots\dots = 0.096 \% \dots\dots\dots \text{---} \text{---} \text{---} \dots\dots\dots \\ \dots\dots\dots \dots\dots\dots = 0.456 \% \dots\dots\dots \\ \dots\dots\dots \\ \dots\dots\dots \end{array}$$

- (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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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

Ca^{2+} comes from fertilizers which are often washing into water bodies. This added nutrient promotes algal growth and can lead to eutrophication. The algae ~~used~~ uses up all dissolved oxygen, ~~this~~ disallowing other organisms

End of Question 31

to survive and blocking all sunlight needed for growth as ~~the~~ sunlight is needed. Overall this has a very bad effect on water quality.