

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

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

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

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..... mass filter paper & solid - mass filter paper = $0.47 - 0.23 = 0.24 = \text{mass solid}$

..... mass evaporating basin & solid - mass evaporating basin = $44.67 - 43.53 = 1.14 = \text{mass solid}$

..... \therefore mass final solid - mass initial solid = $1.14 - 0.24 = 0.9 = \text{mass dissolved solids}$

..... $\therefore \frac{0.9 \text{ g}}{1.14 \text{ g}} \times 100 = 78.95\%$

- (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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..... Put AgNO_3 in the sample a sample. Observe for

..... a white precipitate which turns brown in sunlight - Presence

..... of this precipitate indicates presence of Cl^- in water

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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

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Lead ions (Pb^{2+}) can pollute waterways. This can come from factory run-off. Lead is toxic to marine life & can also cause learning difficulties in children, anaemia & replace calcium in bones if in humans, making it unsafe to drink.

End of Question 31