

**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

0.74

0.14

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

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

$$\frac{0.74}{250} \times 100 = 0.296$$

∴ the percentage of total dissolved solids in the dam sample is 0.296%.

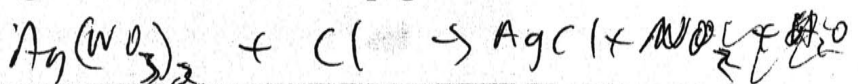
- (ii) It is suspected that the water in the dam has a high concentration of chloride ions. 2

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.

Take a sample of the water in the dam, about 4 mL, and place it into the test tube. Add 2-3 drops of silver nitrate solution. Invert the test tube 5 times to mix thoroughly, and a yellow colour should be observed. If yellow colour is present a positive test for the presence of  $\text{Cl}^-$  ions is shown.

yellow

of  $\text{Cl}^-$  ions is shown. Question 31 continues on page 24



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

Potassium and Sodium ions as well as phosphorus and nitrogen can cause an imbalance in water ways. They can be identified through contamination of causes water hardness, turbidity and severe pollution in water ways.

**End of Question 31**