**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.

mass of solid = 0.24 g

mass of remaing solid = 1.14 g

$\frac{0.24}{1.14} \times 100 =$ 21 % TDS.

(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.

Add silver nitrate. to test for $Cl^-$.

$AgNO_{3(aq)} + Cl^-_{(aq)} \rightarrow AgCl_{(s)} + NO_3^-{}_{(aq)}$

~~When silver chloride forms~~

If a precipitate forms this is an indication of chloride ions.

**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**

Mercury ions are a heavy metal and they are toxic in water. They attack the brain and can cause heart disease. Mercury can comes from computer parts which use mercury in the circuits. These parts are frequently dumped in waterways.

**End of Question 31**