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

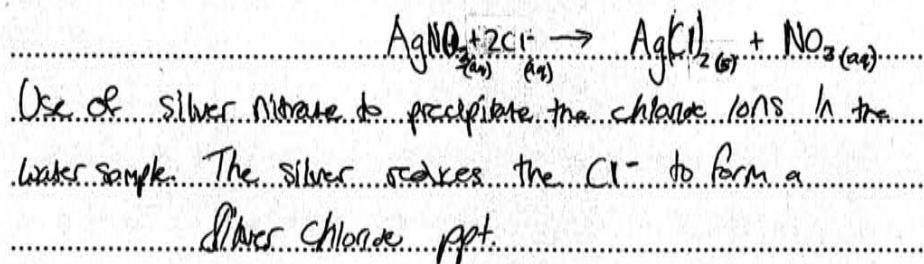(i) The water was filtered and the filtrate evaporated to dryness.   **2**

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

44.67 - 43.53 = 1.14

$\frac{.0014}{.25} \times 100 = .456\%$ of Total dissolved solids

(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.

$AgNO_{3(aq)} + 2Cl^-_{(aq)} \rightarrow AgCl_{2(s)} + NO_{3(aq)}$

Use of silver nitrate to precipitate the chloride ions in the water sample. The silver reacts the Cl^- to form a silver chloride ppt.

2008   – 23 –

Question 31 (continued)

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

Name: Pb^{2+} Source: - low Ph water eroding water pipes containing lead.

- buring battery castings and waste oil

- combustion of leaded fuel

effects: Increased amount of heavy metals in the water, which will
effect marine life and water quality. To remove Pb^{2+}, water
can be passed through membane filter, although for a whole waterway, this is
inefficient.

End of Question 31