OCR
Oxford Cambridge and RSA

GCSE Chemistry A (Gateway Science)

J248/04 Chemistry A C4-C6 and C7 (Higher Tier)

Question Set 27

1 Aluminium is extracted from its ore using electrolysis.

Copper is extracted from its ore by heating with carbon.

(a) Explain why different methods are used to extract aluminium and copper. **[2]**

Copper is below carbon in the reactivity series and so its oxide can be reacted with carbon to obtain the metal. → displacement

Aluminium is above carbon, so this method cannot be used.

(b) Molten aluminium oxide contains Al^{3+} and O^{2-} ions.

The electrolysis of molten aluminium oxide makes aluminium and oxygen.

(i) Write the **balanced** half-equation for the reaction that happens at the cathode.

Use the symbol e^- to represent an electron. **[1]**

$Al^{3+}_{(aq)} + 3e^- \rightarrow Al_{(s)}$

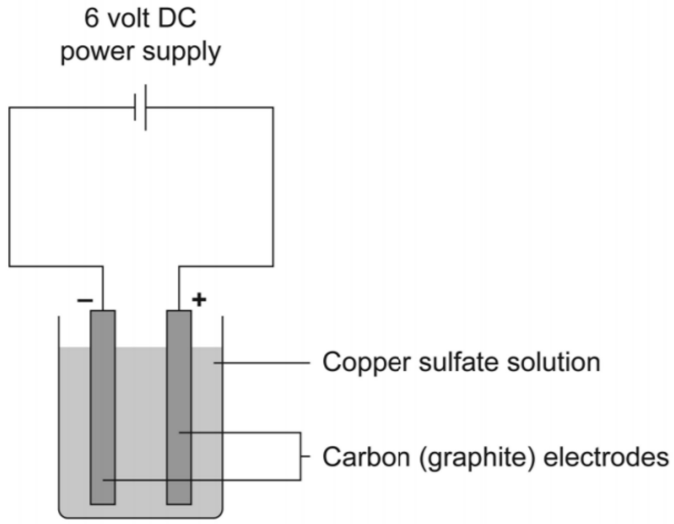
(ii) Solid aluminium oxide **cannot** be electrolysed.

Explain why. **[1]**

The ions are not mobile.

(c) Copper is also made by electrolysis of copper sulfate solution.

Look at the diagram of the apparatus used in this electrolysis.



Describe what you would **see** at each electrode.

At the anode: ....bubbles of a colourless gas.....

At the cathode: ...brown layer forms.....

[2]

Total Marks for Question Set 27: 6