

Electrolysis (F)

1. An aqueous solution of concentrated sodium chloride is electrolysed. Bubbles are seen at the **positive** electrode.

What is the name of the substance produced at the positive electrode?

- A Chlorine
- B Hydrogen
- C Sodium
- D Oxygen

Your answer

[1]

2. During the electrolysis of molten copper chloride, what is made at the **positive** electrode (anode)?

- A Chloride
- B Chlorine
- C Copper
- D Hydrogen

Your answer

[1]

3. This question is about structure and bonding.

Look at the two structures, **A** and **B**, in **Fig. 22.1**.

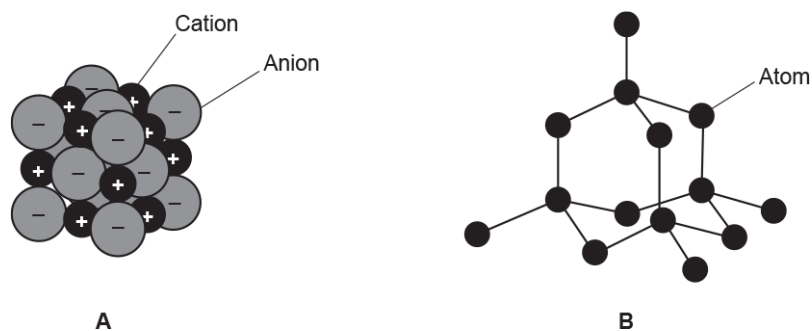


Fig. 22.1

i. Identify the bonding in structure **A**.

Explain your answer.

Bonding

Explanation

[2]

ii. Explain why structure **B** has a high melting point.

[2]

iii. Explain why structure **B** does **not** conduct electricity.

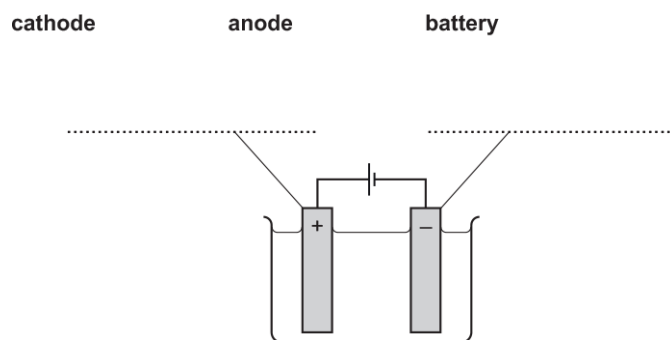
[1]

4 (a). Electrolysis can be used to separate the elements in some compounds using electricity.

- i. Look at the diagram of an electrolysis experiment.

Complete the diagram using the words in the list.

You may use each word once, more than once or not at all.



[2]

- ii. A teacher demonstrates the electrolysis of molten lead bromide.

Predict the products made at each electrode.

Positive electrode

Negative electrode

[2]

- iii. Molten lead bromide contains lead ions, Pb^{2+} , and bromide ions, Br^- .

What is the formula for lead bromide?

Tick (✓) **one** box.

PbBr

PbBr₂

Pb₂Br

Pb₂Br₂

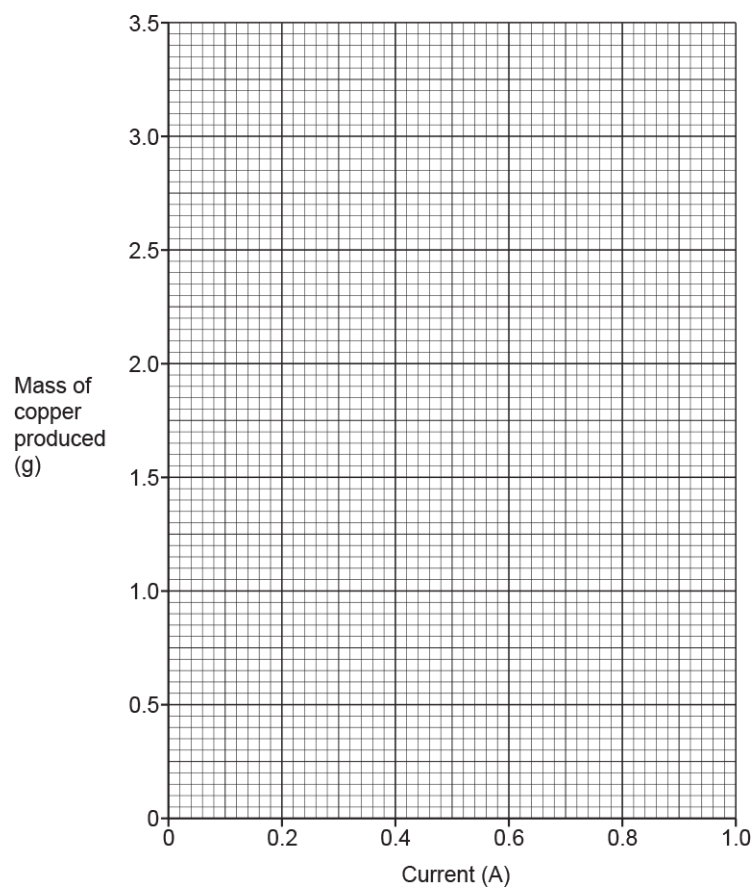
[1]

(b). The student investigates the mass of copper made during the electrolysis of aqueous copper chloride.

The student varies the electric current and passes the current for the same time in each experiment. Here is a table of their results.

Current (A)	Mass of copper produced (g)
0.2	0.6
0.4	1.3
0.6	1.8
0.8	2.5
1.0	3.1

- i. Plot a graph of the student's results and draw a line of best fit.



[3]

- ii. Use your graph to **estimate** the current needed to make 2.25 g of copper.

Current = A [1]

- iii. Use your graph, and a calculation, to find the mass of copper that would be produced using 15 A.

Give your answer to 2 significant figures.

Mass of copper produced = g [2]

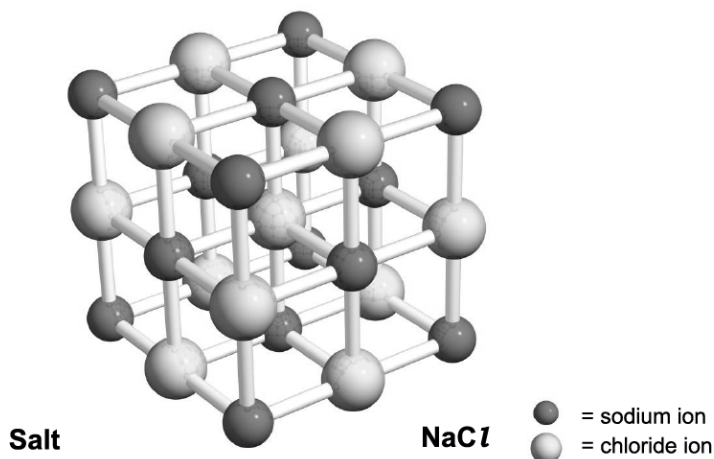
- 5(a). Javier is electrolysing a solution of sodium chloride, NaCl, in water, H₂O.

Complete the list of ions present in sodium chloride solution.

Positive ions (cations)	Negative ions (anions)
Na ⁺
.....	OH ⁻

[2]

- (b). Here is a diagram of a sodium chloride crystal.



The Cl-Na-Cl length in a crystal of sodium chloride is 0.564 nm.

What is the volume of this cube in nm³? Give your answer to 3 significant figures.

volume = nm³

[3]

END OF QUESTION PAPER