

Reactivity Electrolysis

GCSE Chemistry · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Explain why solid lead bromide does not conduct electricity but molten lead bromide does. (2 marks)

Step 1 · Solid

The ions are held in fixed positions in the lattice and cannot move.

Step 2 · Molten

The ions are free to move to the electrodes and carry the current.

Answer: Ions can only move when molten (or dissolved)

Check: Electrolysis needs mobile ions.

2. Now try one with the steps

Predict the products at each electrode when molten zinc chloride is electrolysed. (2 marks)

Step 1 · Cathode (–)

Step 2 · Anode (+)

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Define the term electrolysis. [1]

2. State what is meant by an electrolyte. [1]

3. Explain why an ionic compound must be molten or dissolved before it can be electrolysed. [2]

4. Name the negative electrode. [1]

5. Name the product at the cathode when molten lead bromide is electrolysed. [1]
- _____
- _____
6. Name the product at the anode when molten lead bromide is electrolysed. [1]
- _____
- _____
7. Predict the products when molten potassium iodide is electrolysed. [2]
- _____
- _____
8. Explain why aluminium is extracted by electrolysis. [1]
- _____
- _____
9. Explain why aluminium oxide is dissolved in cryolite. [2]
- _____
- _____
10. Explain why the carbon anodes in aluminium extraction must be replaced regularly. [2]
- _____
- _____
11. Write the half equation for the reaction at the cathode in the electrolysis of molten lead bromide. [1]
- _____
- _____
12. Write the half equation for the reaction at the anode in the electrolysis of molten lead bromide. [1]
- _____
- _____
13. Calculate the mass of aluminium, in tonnes, produced from 204 tonnes of aluminium oxide. $2\text{Al}_2\text{O}_3 \rightarrow 4\text{Al} + 3\text{O}_2$ (Al = 27, O = 16) [3]
- _____
- _____
- _____
- _____
14. Explain why the reaction at the cathode is described [1]
- _____
- _____

4. Before you hand it in

Mixing up the anode and cathode

Cathode = negative, attracts positive ions. Anode = positive, attracts negative ions. (PANIC: Positive Anode, Negative

Is Cathode.)

"Electrons flow through the electrolyte."

Electrons flow in the wires; ions move in the electrolyte.

"Cryolite is a catalyst."

Cryolite lets the aluminium oxide melt (dissolve) at a lower temperature, saving energy.