

Electrolysis Aqueous Solutions

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

Name _____ Class _____ Date _____

1. Worked example

Predict the products at each electrode when potassium chloride solution is electrolysed. (2 marks)

Step 1 · Cathode

Potassium is more reactive than hydrogen, so hydrogen gas is produced.

Step 2 · Anode

Chloride ions are present (a halide), so chlorine gas is produced.

Answer: Hydrogen at the cathode, chlorine at the anode

Check: Potassium is never produced from a solution.

2. Now try one with the steps

Copper(II) sulfate solution is electrolysed with inert electrodes. Describe what you would see at each electrode. (2 marks)

Step 1 · Cathode

Step 2 · Anode

Answer:

3. Practice

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

1. List the four ions present in sodium chloride solution. [2]

2. State where the H^+ and OH^- ions in an aqueous solution come from. [1]

3. Name the product at the cathode when sodium chloride solution is electrolysed. [1]

4. Name the product at the anode when sodium chloride solution is electrolysed. [1]

5. Name the solution left after electrolysis of sodium chloride solution. [1]
- _____
- _____
6. Name the product at the cathode when copper(II) sulfate solution is electrolysed with inert electrodes. [1]
- _____
- _____
7. Name the product at the anode when copper(II) sulfate solution is electrolysed with inert electrodes. [1]
- _____
- _____
8. Explain why hydrogen, not potassium, is produced at the cathode when potassium bromide solution is electrolysed. [1]
- _____
- _____
9. Describe the test for chlorine. [1]
- _____
- _____
10. Predict the products at each electrode when sodium sulfate solution is electrolysed. [2]
- _____
- _____
11. In the electrolysis of sodium sulfate solution, 30 cm³ of hydrogen is collected. Calculate the volume of oxygen collected in the same time, in cm³. [1]
- _____
- _____
12. Explain why the blue colour of copper(II) sulfate solution fades during electrolysis with inert electrodes. [2]
- _____
- _____
13. Write the half equation for the formation of oxygen at the anode from hydroxide ions. [1]
- _____
- _____
14. Write the half equation for the formation of hydrogen at the cathode. [1]
- _____
- _____

4. Before you hand it in

"Sodium is produced at the cathode from salt water."

From solutions, reactive metals are NOT produced: hydrogen forms instead.

"Oxygen forms at the anode from sodium chloride solution."

If chloride, bromide or iodide is present, the halogen forms at the anode.

Forgetting the ions from water

Always list four ions for an aqueous solution of a salt.