

OCR (A) Chemistry GCSE

PAG 2 (chemistry) / PAG C1 (combined
science): Electrolysis
Notes



Microscale Electrolysis of Copper(II) Chloride

Aim

To successfully set up a microscale electrolysis reaction of copper(II) chloride and to analyse the products formed.

Equipment list

- Pre-prepared petri dish with two small holes on opposite sides and a lid
- Two inert electrodes
- Power pack
- Two crocodile clips and wires
- Blue litmus paper
- Dropping pipettes
- Blue tack

Chemicals required

- Aqueous copper(II) chloride solution
- Aqueous potassium bromide solution
- Aqueous potassium iodide solution

Method

1. Set up the apparatus as shown in figure 1 below. The electrodes should be placed through the holes in the sides of the petri dish. Connect the crocodile clips to the ends of the electrodes then connect to a power supply. Use blue tack to secure the electrodes in place in the holes.
2. Using the dropping pipette, place 10 drops of the copper(II) chloride solution between the ends of the electrodes. Make sure both electrodes touch the solution.
3. Using clean dropping pipettes, place 5 drops each of potassium iodide and potassium bromide into the petri dish. Make sure none of the liquids touch.
4. Dampen a piece of blue litmus paper and place it in the petri dish, away from the solutions.
5. Place a lid on the petri dish.
6. Turn on the power supply to 3.00 V for up to 2 minutes. Record any observations in a table.

Key points

- The lid must be placed on the dish before starting the reaction, to prevent any gases produced from escaping.
- It is important that the electrodes do not touch. If the electrodes touch, the current will flow from one electrode to the other, without passing through the liquid.
- Blue litmus paper will be bleached white if chlorine gas is present.
- The potassium bromide and potassium iodide solutions can be used to test for the formation of chlorine. These solutions react with chlorine gas in a displacement reaction and change colour.
- The brown substance which forms on the cathode/ negative electrode is copper.



Diagram

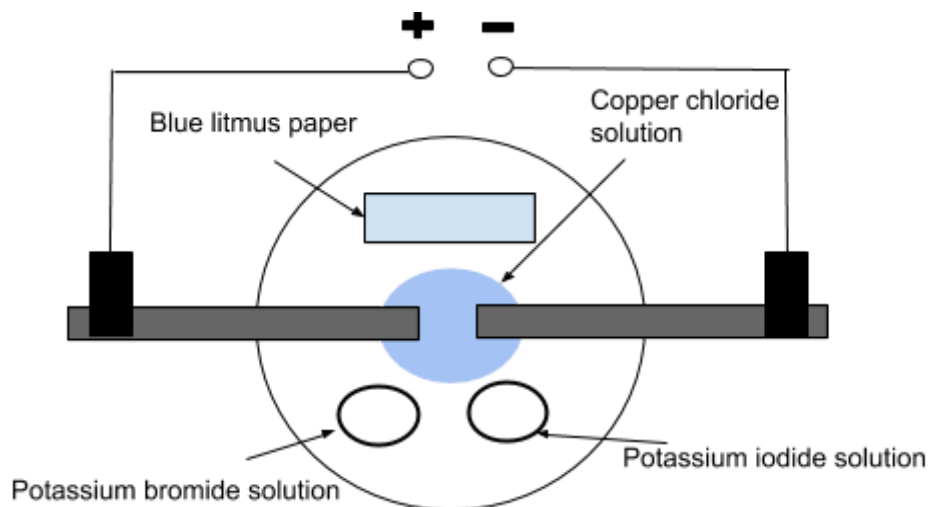


Figure 1 Experiment Setup

Safety Precautions

- Keep the room well ventilated as chlorine gas is toxic and an irritant.
- Wear safety goggles.
- Keep lid on the petri dish when the reaction is being carried out so that the chlorine gas is trapped.

Analysis of results

	Observation
Potassium bromide solution	Turns from colourless to light orange
Potassium iodide solution	Turns from colourless to orange/brown
Positive electrode	Bubbles produced
Negative electrode	Brown substance produced
Damp blue litmus paper	Turns pink then white
Copper chloride solution	Slowly turns from pale blue to colourless

