

# OCR (A) Chemistry A-level

## PAG 8: Electrochemical Cells

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## 8.1 Electrochemical Cells 1

### Method

1. Clean a piece of copper and a piece of carbon using emery paper or fine grade sandpaper. Rinse the copper and carbon with distilled water then dry them.
2. Place the copper into a 100 cm<sup>3</sup> beaker with about 50 cm<sup>3</sup> of 0.1 mol dm<sup>-3</sup> CuSO<sub>4</sub> solution.
3. Using a crocodile clip, connect the copper electrode to the negative terminal of the voltmeter.
4. Place the carbon electrode into a beaker containing about 50 cm<sup>3</sup> of a mixture of aqueous ammonium iron (II) sulfate: iron (III) chloride (1:5 ratio).
5. Using a crocodile clip, connect the carbon electrode to the positive terminal of the voltmeter.
6. Make a salt bridge by soaking a piece of filter paper in saturated potassium nitrate solution. Place the ends of the filter paper into the solutions in the beakers.
7. Measure and record the voltmeter readings in a suitable format.
8. Repeat the experiment with a different ratio of aqueous ammonium iron (II) sulfate: iron (III) chloride.

### Salt bridges:

- Allow the movement of ions between electrodes by completing the circuit.
- Must not react (inert) with the electrolyte or ions in solution and must conduct electricity.
- A U tube may be used instead of filter paper.

### Safety

- Copper sulfate solution - causes skin and serious eye irritation; harmful if swallowed.
- Ammonium iron (II) sulfate - causes skin and serious eye irritation; may cause respiratory irritation.
- Iron (III) chloride - harmful if swallowed; causes severe skin burns and eye damage.
- Potassium nitrate solution - causes skin and serious eye irritation; may cause respiratory irritation.

