

Electrolysis of aqueous solutions

Equipment (per group)

- 100 cm³ beaker
- Two carbon electrodes
- Two crocodile clips plus wires (one red, one black)
- DC power supply
- Two test tubes (if intending to collect gas)
- Electrodes holder if available (this should have the two crocodile clips fitted)
- Splints and matches

Alternative: electrolysis cell with carbon electrodes and glass sample tubes

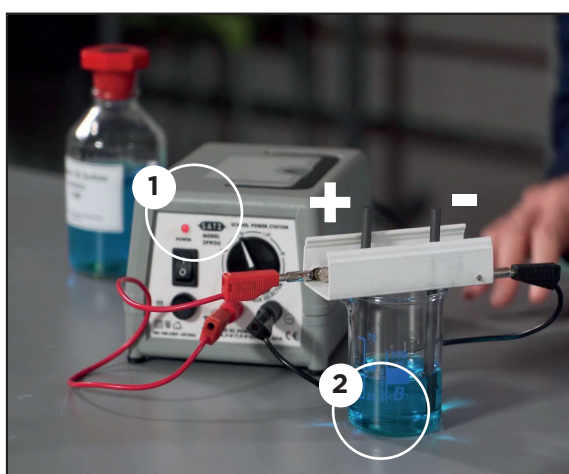
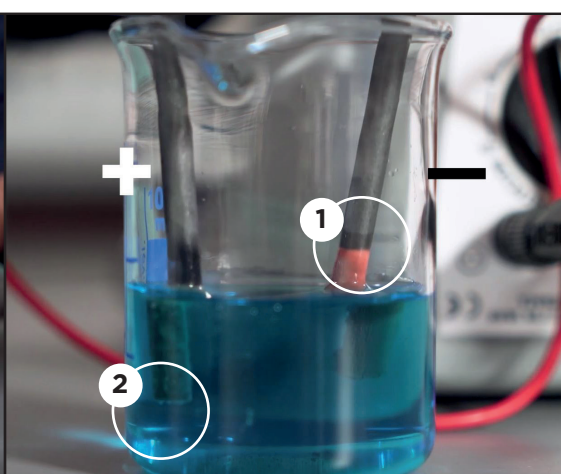
Safety equipment: safety spectacles

Preparation

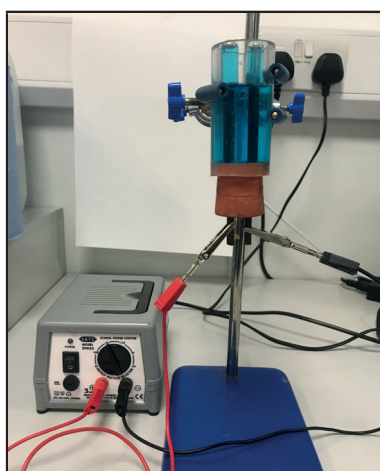
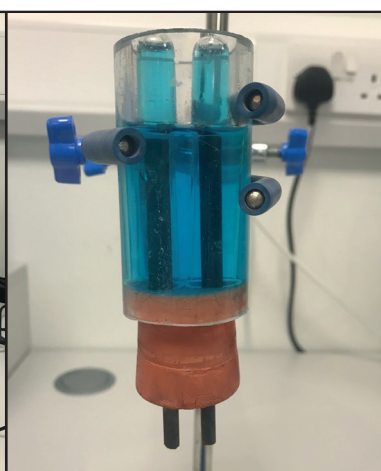
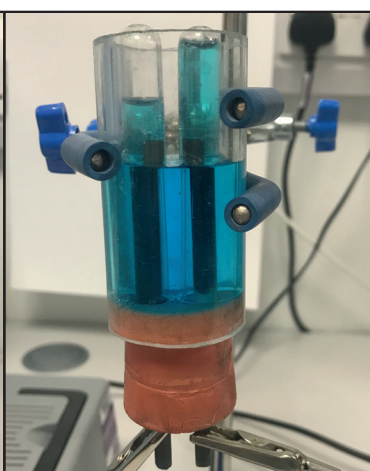
- 0.5 mol dm⁻³ copper(II) sulfate solution – maximum 50 cm³.

Equipment set-up and tips

Set up using a beaker and electrode holder (as in the video)

	
<p>1. Power supply set at 6 Volts DC.</p> <p>2. Use inert electrodes and check that they are not touching each other.</p>	<p>1. Copper coating at the negative electrode.</p> <p>2. Gas bubbles at positive electrode.</p>

Set up using an electrolysis cell



		
<p>6 Volts DC wires attached to the electrodes.</p>	<p>Electrodes covered by test tubes filled with solution.</p>	<p>Gas produced is trapped in the test tube.</p>

Safety

Read our [standard health & safety guidance](#) and carry out a risk assessment before running any live practical.

Refer to SSERC/CLEAPSS Hazcards and recipe sheets.

Hazard classification may vary depending on supplier.

Chemical supplied for the practical	Preparation
Copper(II) sulfate(VI) solution – 0.5 mol dm ⁻³ CuSO ₄ (aq)	Copper(II) sulfate(VI)–5–water CuSO ₄ ·5H ₂ O (s) MW= 249.68 g mol ⁻¹
 <p>DANGER Corrosive (eyes) Irritant (skin)</p>	 <p>DANGER Harmful if swallowed Causes severe skin burns Causes serious eye irritation Very toxic to aquatic life with long lasting effects</p>

Disposal

The copper(II) sulfate solution can be filtered if it contains solid residue and re-used for the same practical. Dispose of the used filter paper and residue in the general waste bin.

If the copper(II) sulfate solution has been contaminated, it needs to be diluted down to below 0.2 mol dm⁻³ before disposal into a foul-water drain.

The copper residue on the carbon electrode can be removed using sandpaper or the electrode can left overnight in a 1.0 mol dm⁻³ solution of nitric acid. Rinse the electrode using distilled water and dilute the nitric acid solution down to 0.1 mol dm⁻³ before disposal into a foul-water drain.

All other products are low hazard in the quantity produced for this practical.