# Aqueous electrolysis: competing ions

Teacher / technician

YEAR 11 / LESSON 111 / CHEMISTRY ONLY

Staff preparation and answer guidance. Keep separate from student sheets. Written and model-based lesson; no laboratory procedure is implied.

## Coverage and delivery

Chemistry only: 1.56C, 1.58C–1.59C. Written predictions for NaCl(aq), dilute $H_2SO_4$ and $CuSO_4$(aq).

Allow about 60 minutes. Follow the student sequence and use the answers to check reasoning.

## Requisition • class of 30, working in 15 pairs

| Item | Per pair / setup | Class total |
|---|---|---|
| Booklet / writing tools | 1 per learner | 30 sets |
| Model kit / periodic table | 1 set per pair | 15 sets |

## Immediate safety

Desk activity only; keep small model pieces away from mouths.

# Preparation and delivery

Read alongside the student method

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**1.** Provide 30 booklets and 15 model kits or reusable atom counters; no chemicals are needed.

**2.** Use 10 minutes retrieval, 25 independent/pair tasks, 15 explanation and 10 corrections. Keep first attempts visible.

**3.** Check charge as well as atom balance; sulfate is not converted to sulfur here.

**4.** No chloride electrolysis or gas tests are performed in this paper session.

**5.** Check all carbon valencies, formula subscripts and equation coefficients. Label any supplied numbers as practice data, not class observations.

## Close of lesson

- Return shared equipment and retain corrected reasoning.

## Check before teaching

Check the cards, reference data and quantities against this requisition. Keep the staff answer guide separate until the checking stage. Supplied numerical practice datasets are labelled examples; they are not class measurements.

# Answers and teaching notes

Expected explanations • do not give as experimental observations

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- Copper at cathode; oxygen at anode.
- Hydrogen at cathode; oxygen at anode.
- Water/hydrogen species are reduced preferentially to the very reactive sodium ion.
- $2H_2O + 2e^- \rightarrow H_2 + 2OH^-$.
- $2Cl^- \rightarrow Cl_2 + 2e^-$.
- Reactive electrodes can participate, for example a copper anode dissolves; predictions would change.

## References and provenance

Pearson Chemistry specification

Prepared 22 November 2026. Original wording, tables and questions. Sources inform the concepts and technique; the lesson scope and classroom quantities are explicitly described here. No laboratory trial or final school risk approval is claimed.