

# WJEC (Wales) Chemistry A-level

## SP 3.1 - Construction of Electrochemical Cells and Measurement of $E_{\text{cell}}$

Methods and images taken from the [WJEC practical handbook](#)

This work by [PMT Education](#) is licensed under [CC BY-NC-ND 4.0](#)





## SP 3.1 - Construction of Electrochemical Cells and Measurement of $E_{\text{cell}}$

### Aim

Construction of a copper/zinc **electrochemical cell** and the determination of  $E_{\text{cell}}$ .

### Apparatus and Chemicals

- Wires
- Crocodile clips
- Voltmeter
- 2 x 100 cm<sup>3</sup> beakers
- Filter paper cut into a long strip
- Cu foil strip
- Zn foil strip
- 1.0 mol dm<sup>-3</sup> CuSO<sub>4</sub> solution
- 1.0 mol dm<sup>-3</sup> ZnSO<sub>4</sub> solution
- Saturated KNO<sub>3</sub> solution



### Safety Considerations

- ★ 1.0 mol dm<sup>-3</sup> CuSO<sub>4</sub> solution - harmful, dangerous to environment
- ★ 1.0 mol dm<sup>-3</sup> ZnSO<sub>4</sub> solution - irritant, dangerous to environment
- ★ Saturated KNO<sub>3</sub> solution - oxidising

### Method

1. Measure 50 cm<sup>3</sup> of CuSO<sub>4</sub> solution into one of the beakers.
2. Measure 50 cm<sup>3</sup> of ZnSO<sub>4</sub> solution into the other beaker.
3. Place the copper foil in the CuSO<sub>4</sub> solution.
4. Place the zinc foil in the ZnSO<sub>4</sub> solution.
5. Connect the zinc foil strip and copper foil strip to the **ammeter**.
6. Connect the **voltmeter** across the zinc foil and copper foil connections.
7. Place the two beakers directly next to each other.
8. Soak the filter paper in the saturated KNO<sub>3</sub> solution and place it across the two beakers.
9. Ensure that the ends of the filter paper are in direct contact with the solutions in the two beakers. This is called a **salt bridge**.
10. Measure the potential difference of the cell using the voltmeter.



## Diagram

