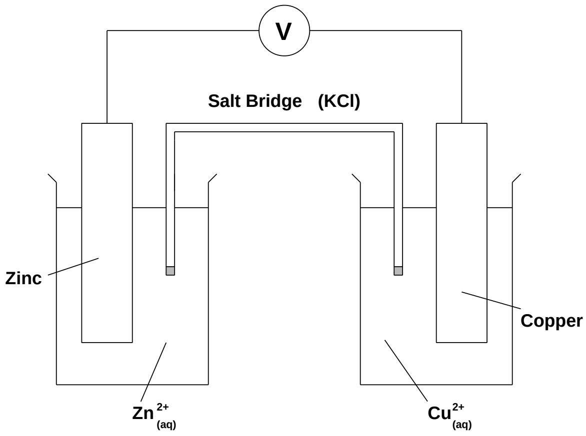
Combining half-cells

In the cell shown, copper has a more positive E° value (+0.34V) than zinc (-0.76V).

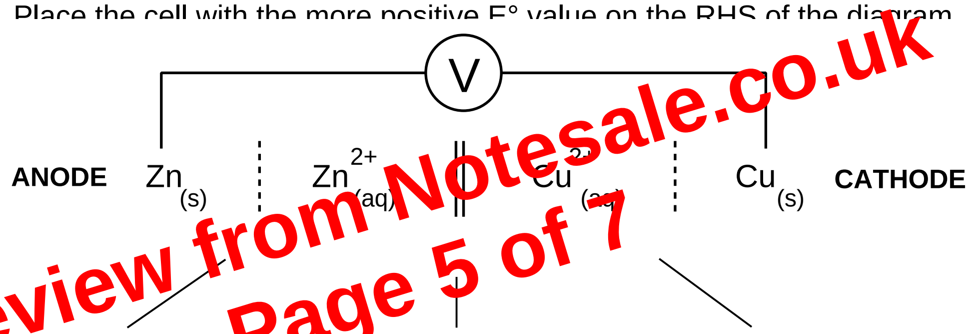


- the zinc metal is more reactive
- it dissolves to give ions
  $Zn_{(s)} \longrightarrow Zn^{2+}_{(aq)} + 2e^-$
- the electrons produced go round the external circuit to the copper
- electrons are picked up by copper ions and copper is deposited
  $Cu^{2+}_{(aq)} + 2e^- \longrightarrow Cu_{(s)}$
- The voltage of the cell is 1.10V.

Cell diagrams

These give a diagrammatic representation of what is happening in a cell.

- Place the cell with the more positive E° value on the RHS of the diagram



zinc is in contact with a solution of zinc ions **the solutions are joined by a salt bridge** **the solution of copper ions is in contact with copper**

- Drawing it out as shown indicates that ...

- the cell **reaction goes from left to right**
- the electrons go round the external circuit from left to right
- the **cell voltage is E°(RHS) - E°(LHS)**. *In this way it must be positive*
- **oxidation** takes place **at the anode** and **reduction at the cathode**

Conclusion **The reaction(s) will proceed from left to right**

***OX**idation*	$Zn_{(s)} \longrightarrow Zn^{2+}_{(aq)} + 2e^-$	*at the ANODE*
***RED**uction*	$Cu^{2+}_{(aq)} + 2e^- \longrightarrow Cu_{(s)}$	*at the CATHODE*

Electrons Go from the anode to the cathode via the external circuit

Cell reaction $Zn_{(s)} + Cu^{2+}_{(aq)} \longrightarrow Zn^{2+}_{(aq)} + Cu_{(s)}$