

## Electrolysing aqueous copper sulfate using reactive electrodes such as copper

**Note :** When the electrodes are reactive , the anode takes part in the reaction and loses electrons and the cathode products are based on the position of ions in the reactivity series.

**List of ions present in the solution:**  $\text{Cu}^{2+}$ ,  $\text{H}^{+}$ ,  $\text{OH}^{-}$ ,  $\text{SO}_4^{2-}$

**Anode:**

Electrode is reactive so it will WILL TAKE PART in electrolysis and get reduced to copper ions( $\text{Cu}^{2+}$ )

**Half equation:**

**Anode:**  $\text{Cu} - 2\text{e}^{-} \rightarrow \text{Cu}^{2+}$ -----Oxidation

**Cathode:**

Ions attracted to the cathode are  $\text{Cu}^{2+}$ ,  $\text{H}^{+}$

$\text{Cu}^{2+}$  ions being lower down in the series are reduced to Cu atoms.

**Half equation:**

$\text{Cu}^{2+} + 2\text{e}^{-} \rightarrow \text{Cu}$ -----Reduction

**Observation:**

**Anode:** Anode becomes smaller (It loses mass as it gets oxidised)

**Cathode:** Cathode becomes thicker

**Electrolyte:** Colour of the solution does not change, it stays blue. This is because copper ions lost from the electrolyte at the cathode are replaced by the copper ions formed at the anode.