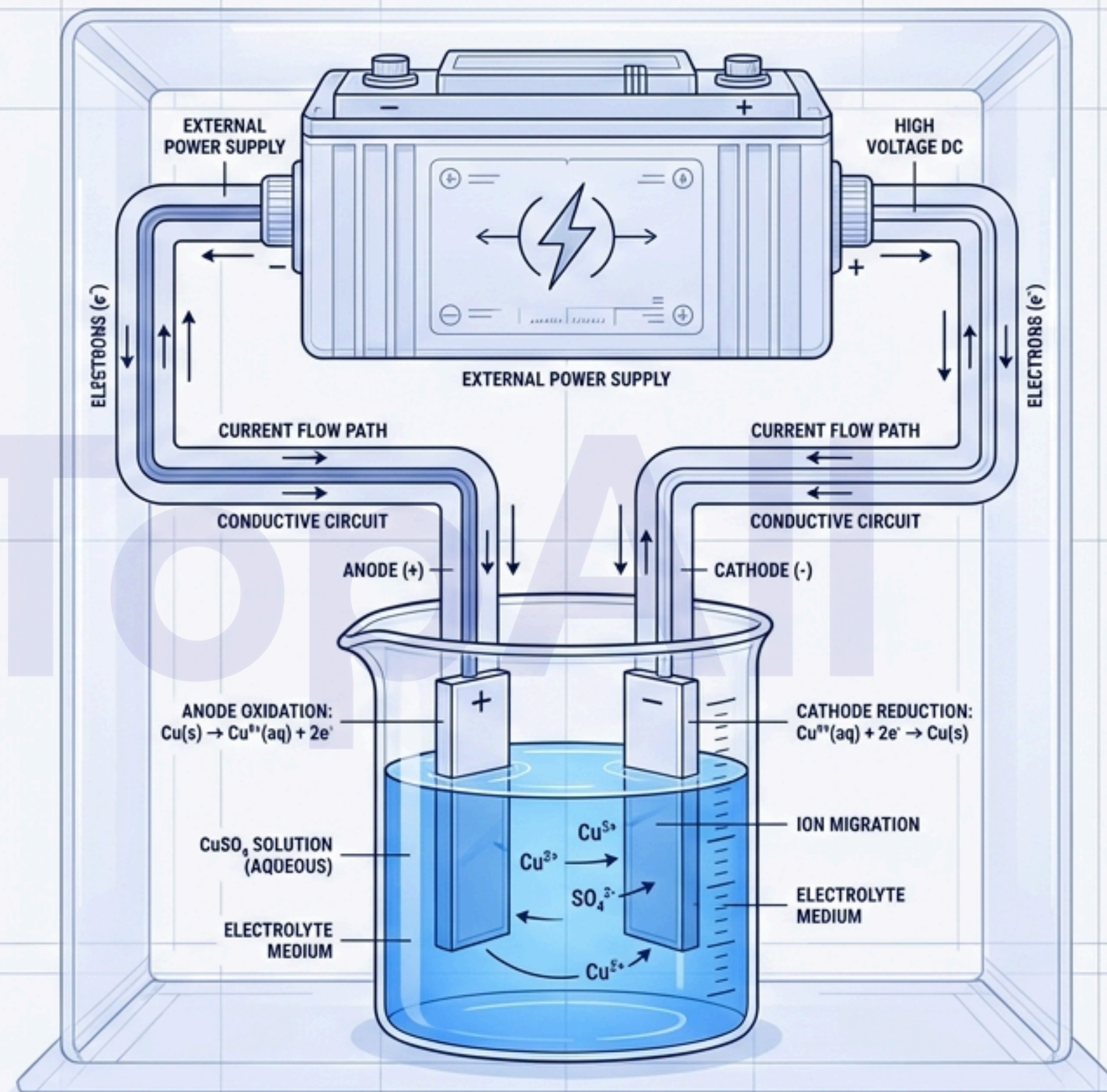


Weightage: High

Electrolysis — Use Electricity to Drive Chemistry



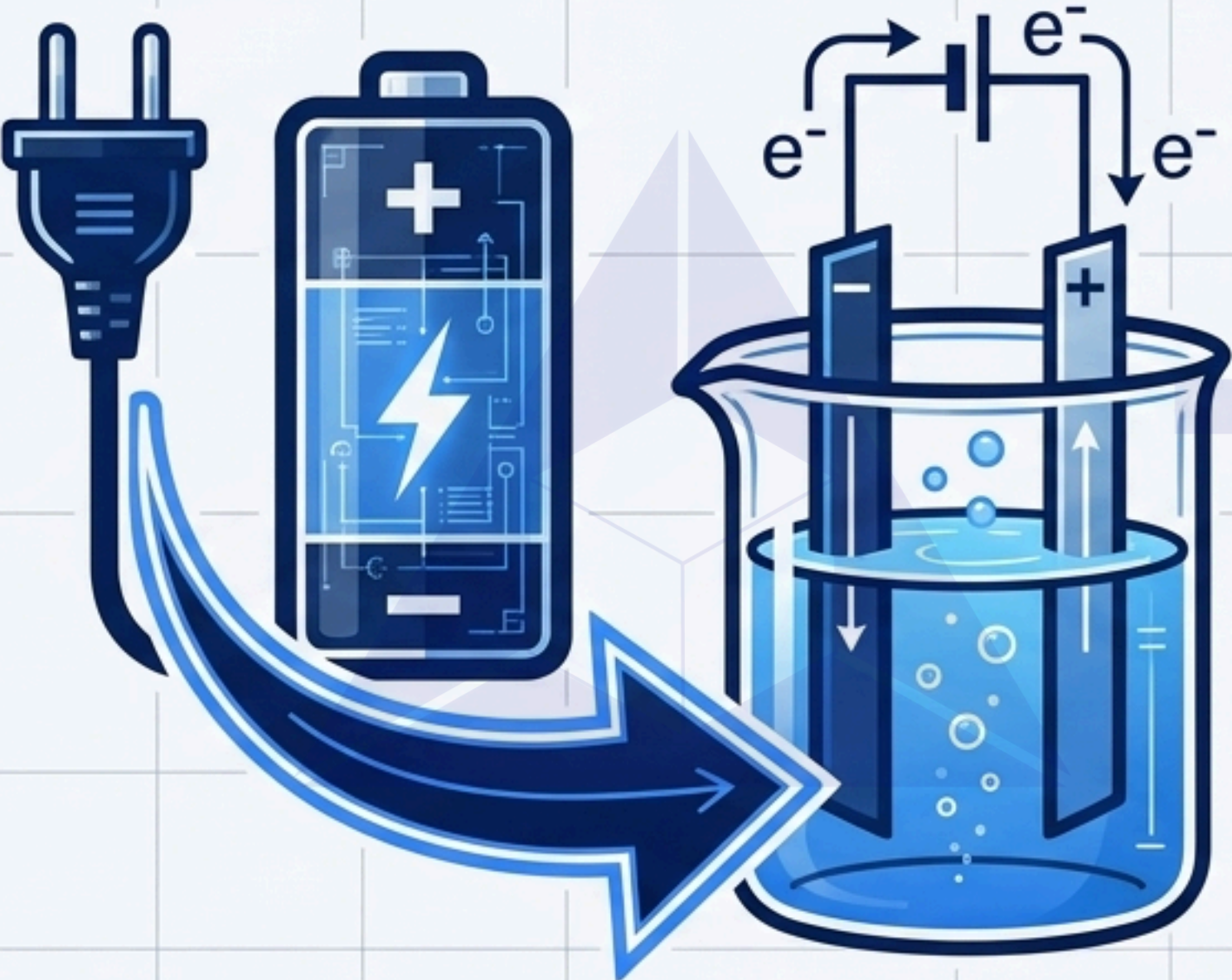
JEE MAIN + ADVANCED

$$\Delta G > 0$$

(Non-spontaneous)

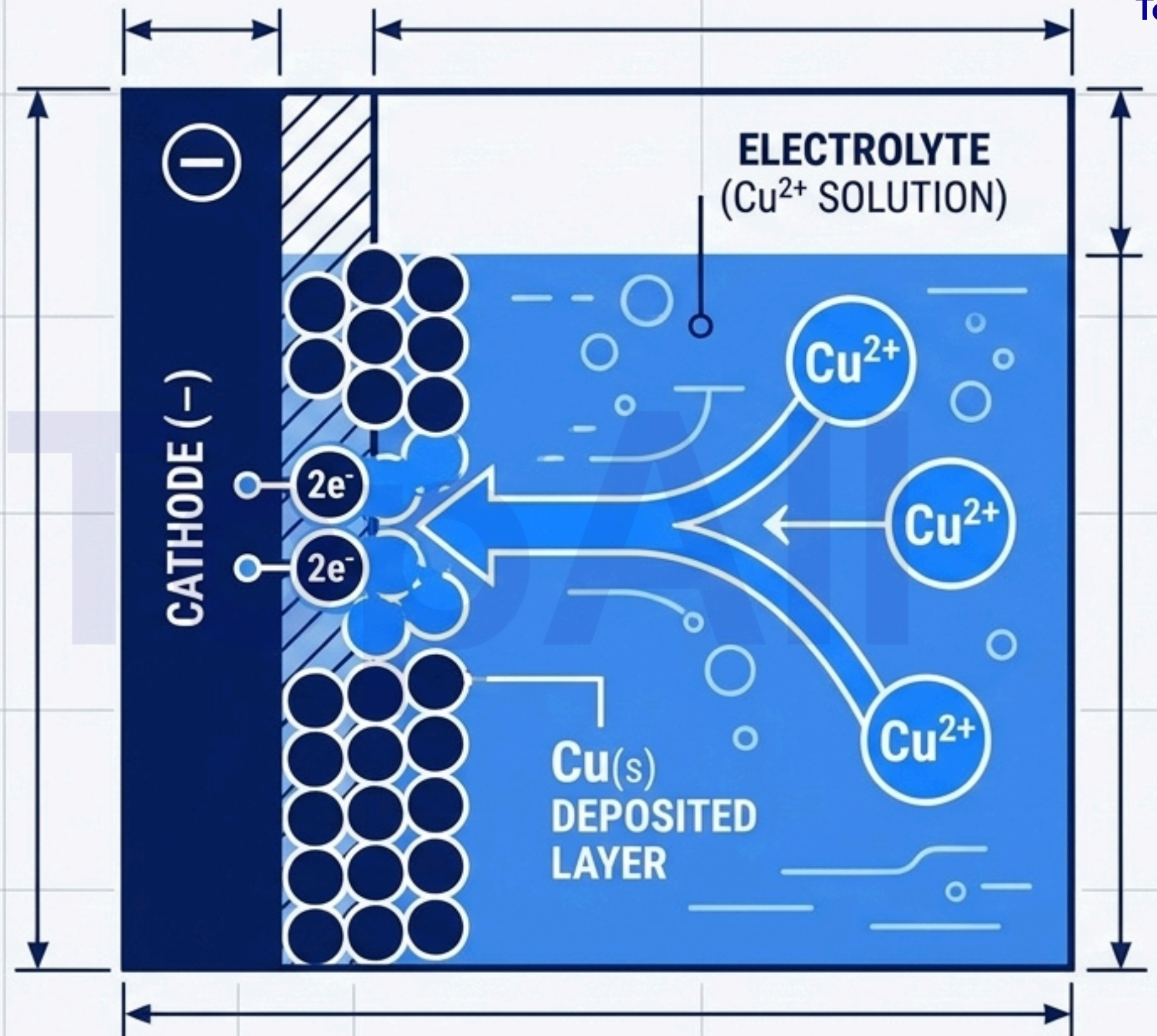
External Voltage
($E_{\text{ext}} > E_{\text{cell}}$)

**Reaction
Driven
Backwards**



Electrical Energy → Chemical Energy

REDUCTION





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$$E=mc^2$$



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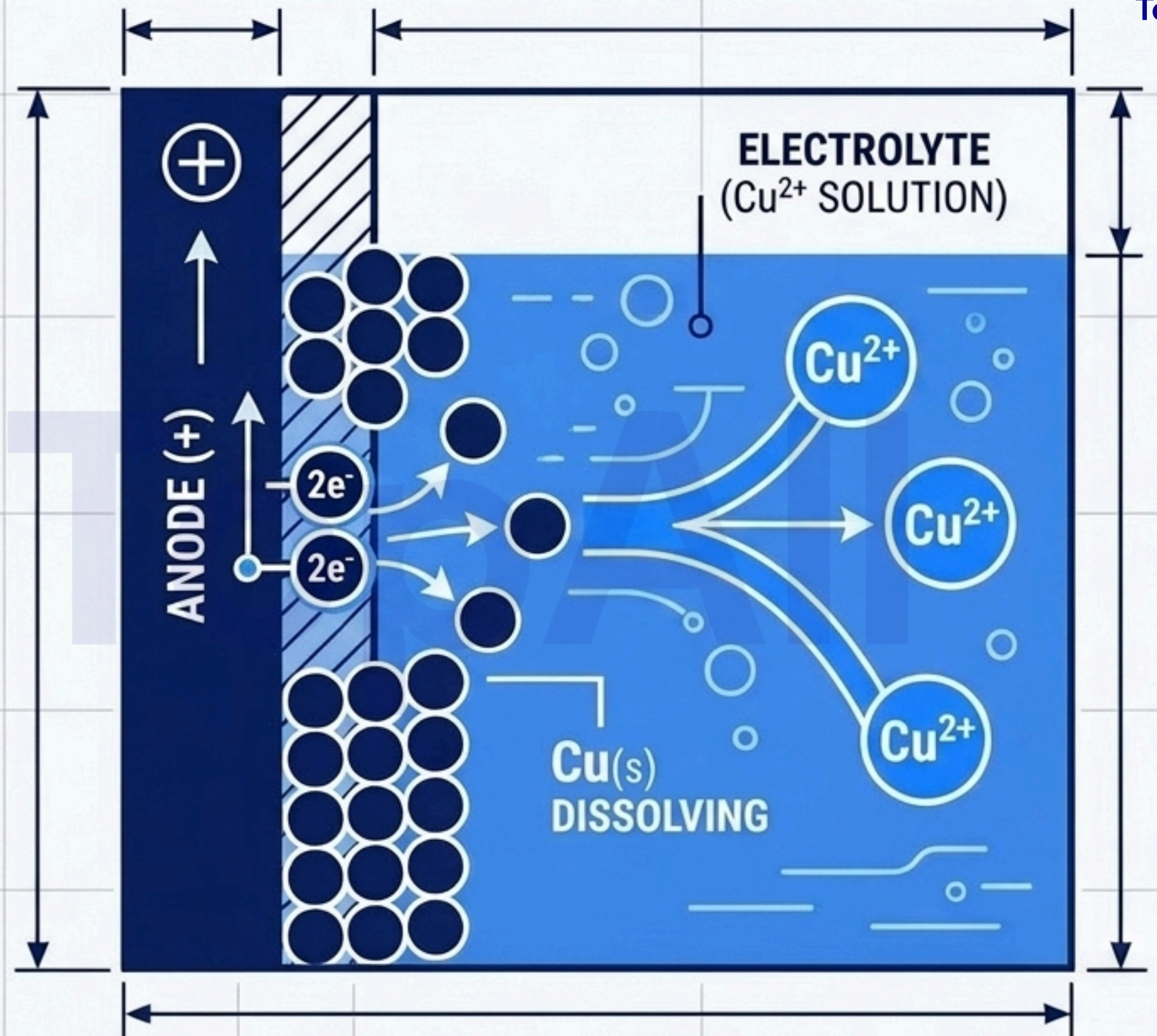
At prep.topall.app

Key Highlights

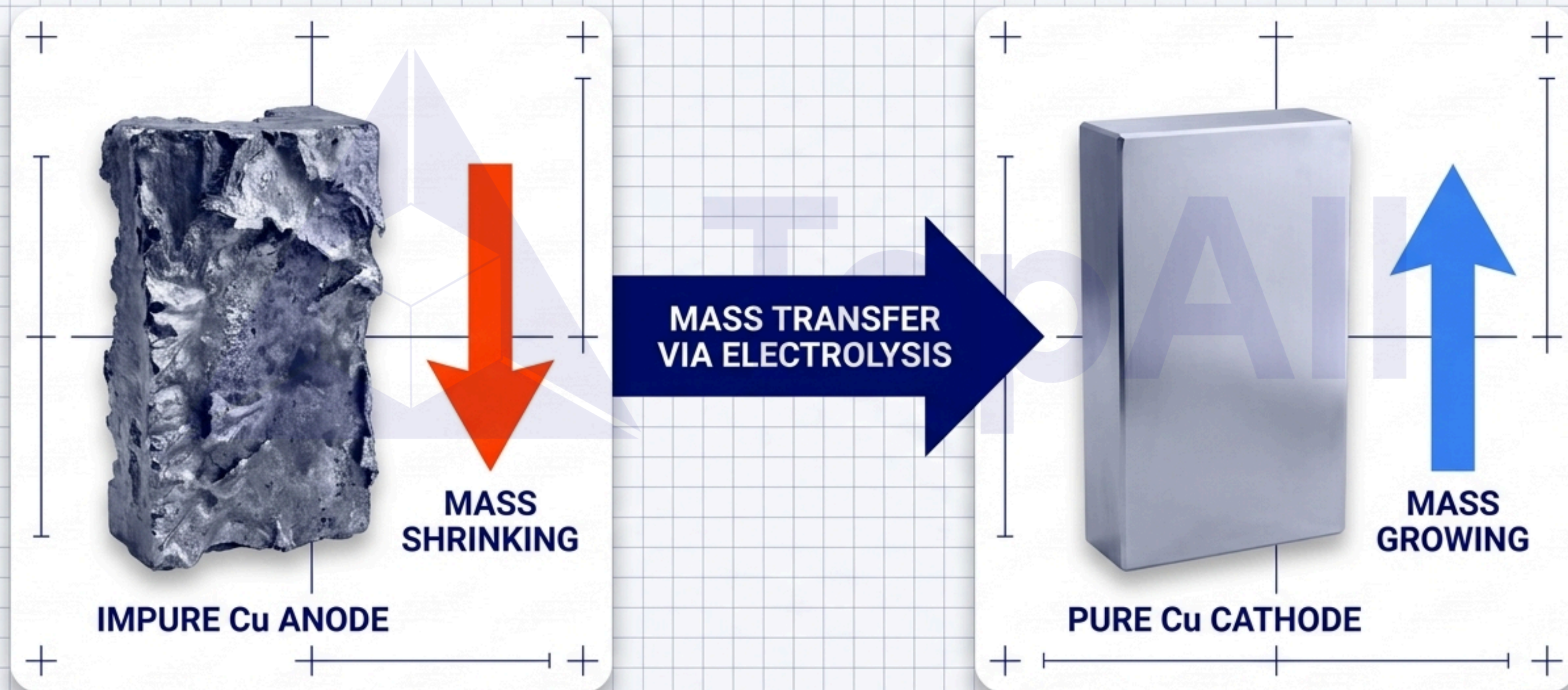
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OXIDATION



COPPER REFINING: BEFORE / AFTER STATE CHANGE



Galvanic Cell

Anode (-) /
Cathode (+)

Electrolytic Cell

Anode (+) /
Cathode (-)

**ANODE = OXIDATION ALWAYS.
CATHODE = REDUCTION ALWAYS.**

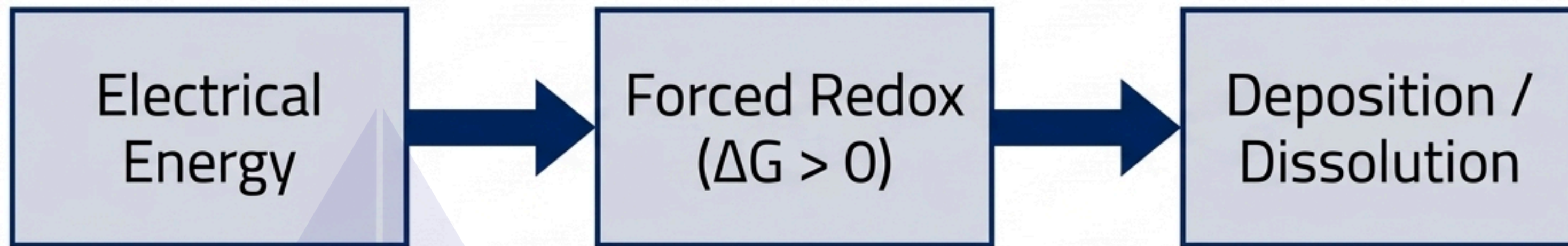


WARNING

TRAP: Assuming the anode is always negative. Polarity (+/-) flips based on the cell type, but oxidation/reduction locations NEVER flip.

ALERT

CRITICAL CONCEPT



Key Takeaways

- Impure metal is heavily oxidized at the anode; pure metal is deposited at the cathode.
- The external voltage must exceed the cell's natural potential ($E_{\text{-ext}} > E_{\text{-cell}}$) to drive the reaction.
- Regardless of the +/- signs, Anode is always Oxidation and Cathode is always Reduction.



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