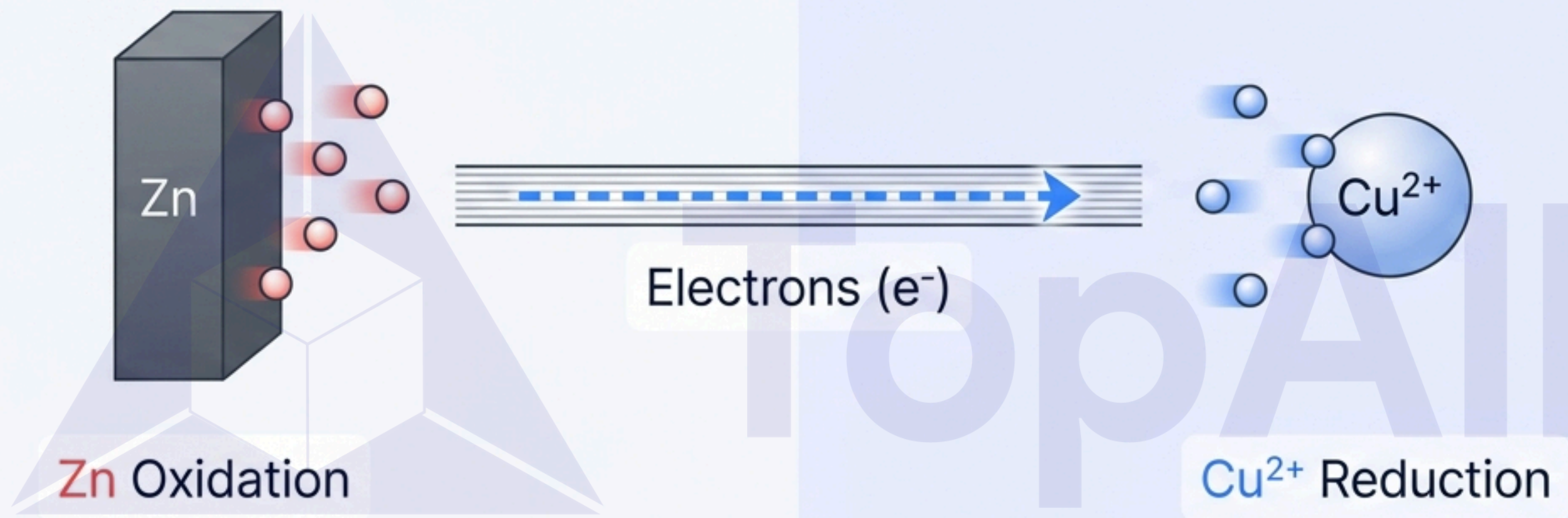
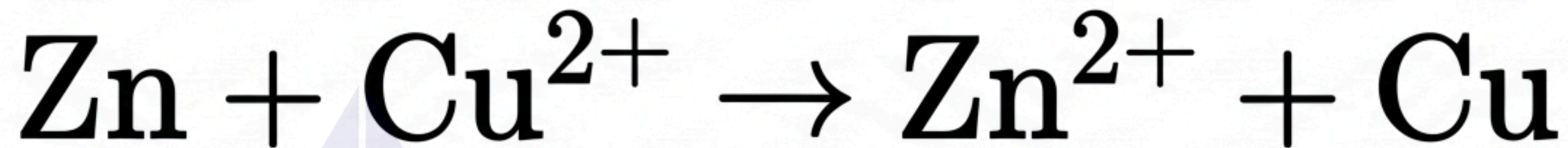




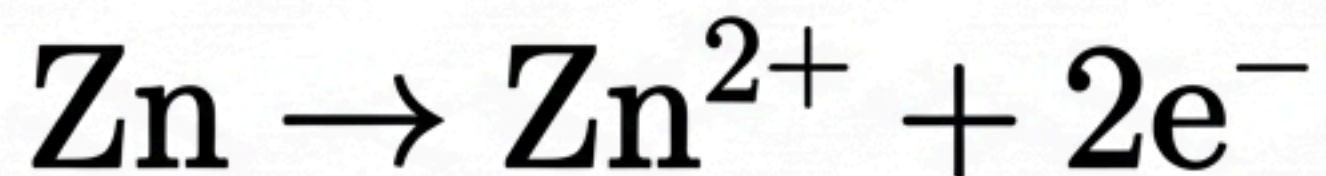
Galvanic Cells — Turn a Redox Reaction Into Current

Separate Oxidation + Reduction → Electrical Energy

OVERALL CELL REACTION



HALF-REACTION 1



Zinc loses electrons.

HALF-REACTION 2



Copper gains electrons.

OXIDATION

ELECTRODE NAME

ANODE

Metal:

Zn (Zinc)

Polarity:

**Negative (–) in
galvanic cell**

REDUCTION

ELECTRODE NAME

CATHODE

Metal:

Cu (Copper)

Polarity:

**Positive (+) in
galvanic cell**





**You've Learned the Theory.
Let's Test Them Now.**

$$E=mc^2$$



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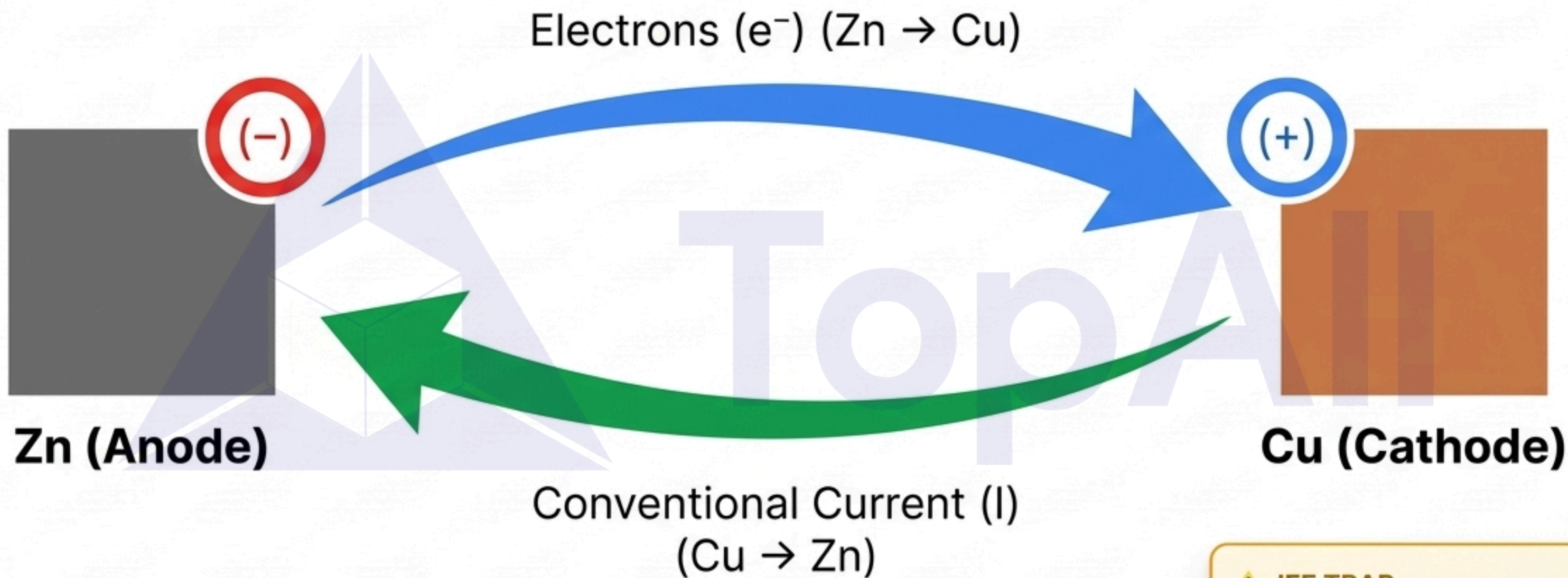


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Key Highlights

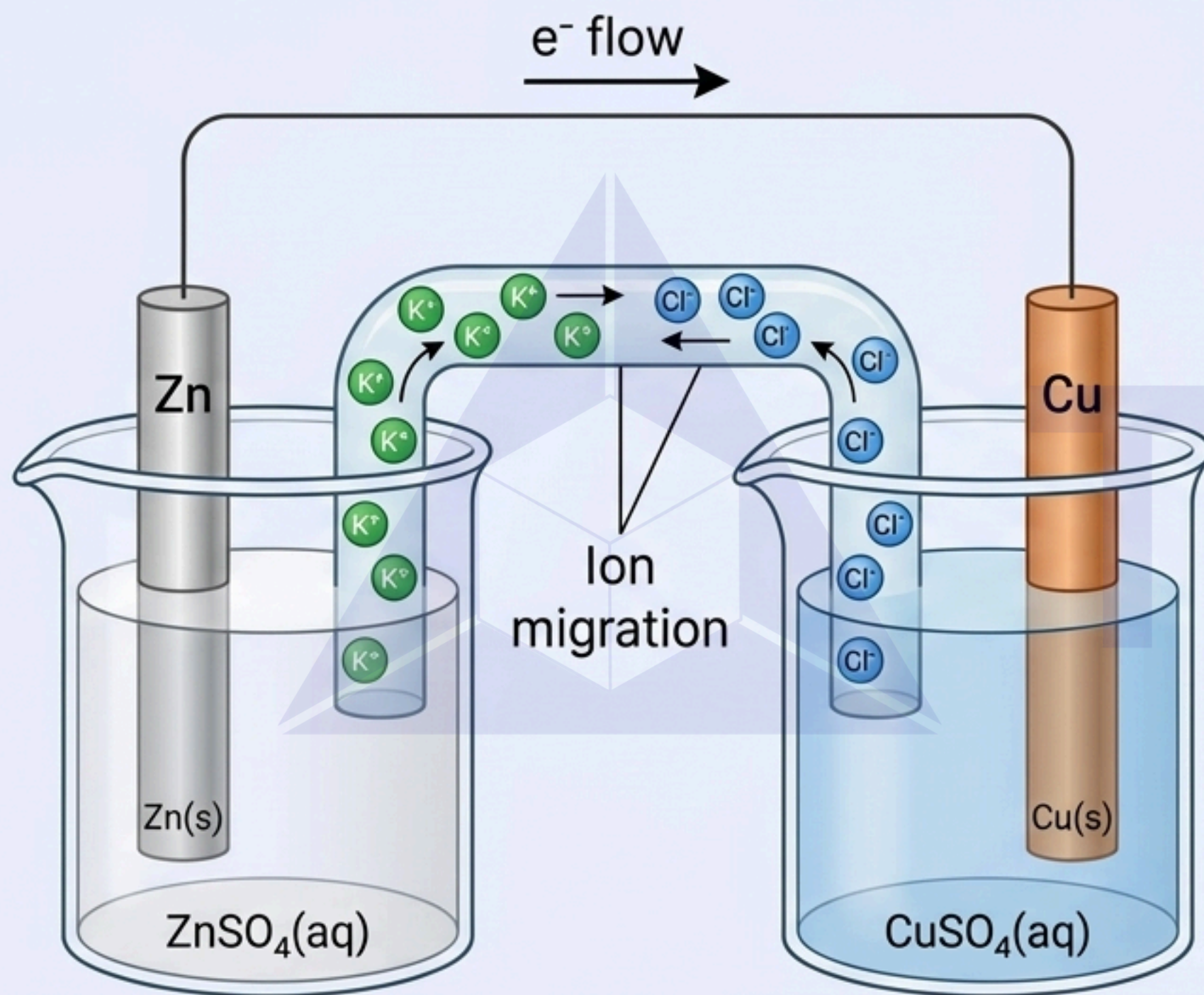
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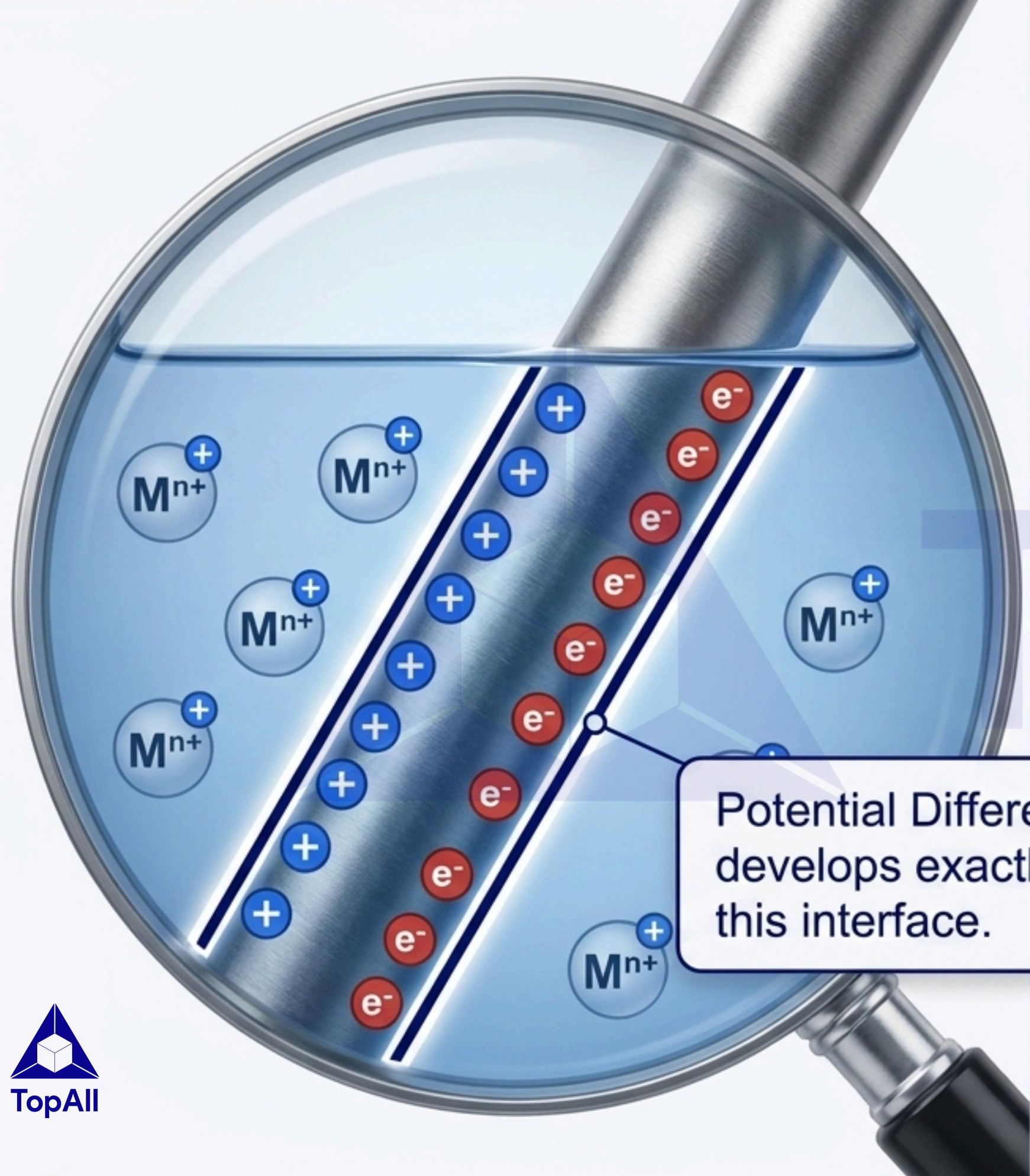
⚠ JEE TRAP

Current direction is exactly opposite to electron direction. Do not mix them up in circuit diagrams!



PRIMARY FUNCTIONS

- Provides an internal connection between the electrolytes to complete the circuit.
- Maintains electrical neutrality in both half-cells.
- **NOT a pathway for electrons** (electrons only flow through the external wire).



Origin of Potential

Metal atoms tend to go into solution as ions, leaving electrons behind.

Conversely, metal ions in solution tend to deposit on the electrode.

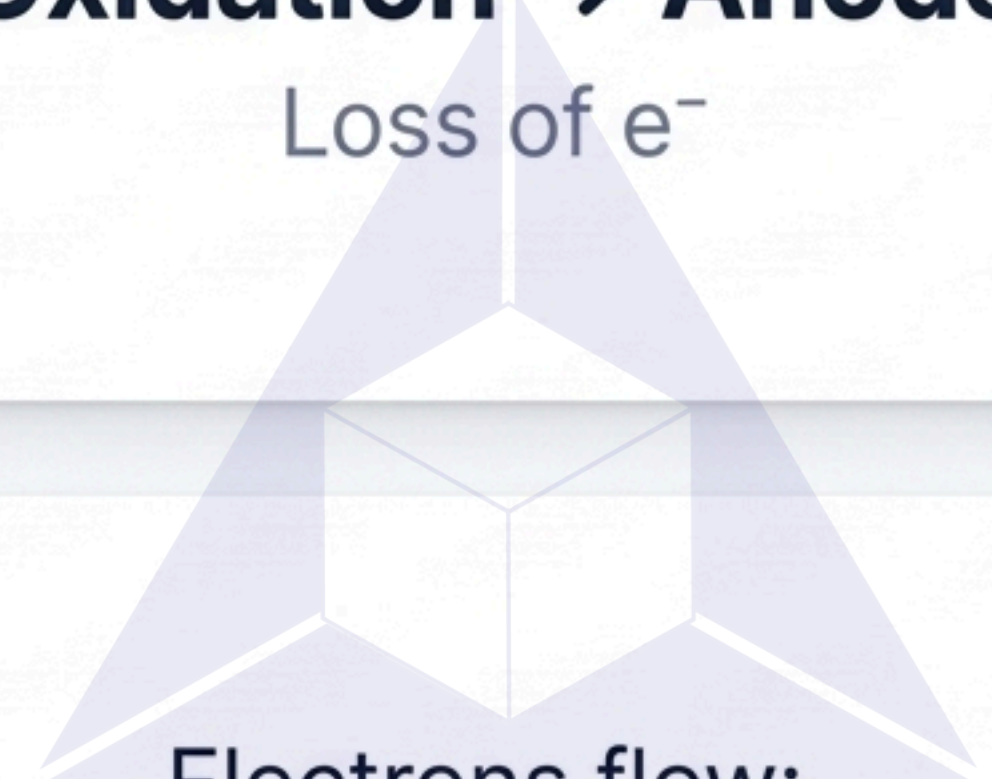
At equilibrium, a potential difference develops.

STANDARD ELECTRODE POTENTIAL (E°)

The half-cell potential when the concentration of all species is exactly **unity** (1 mol/L) and gases are at 1 bar.

Oxidation → Anode

Loss of e^-



Electrons flow:
Anode to Cathode

Reduction → Cathode

Gain of e^-

Current flows:
**Opposite direction
(Cathode to Anode)**



You've Learned the Theory.

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