

Electrochemistry

“GALVANIC CELL “

By

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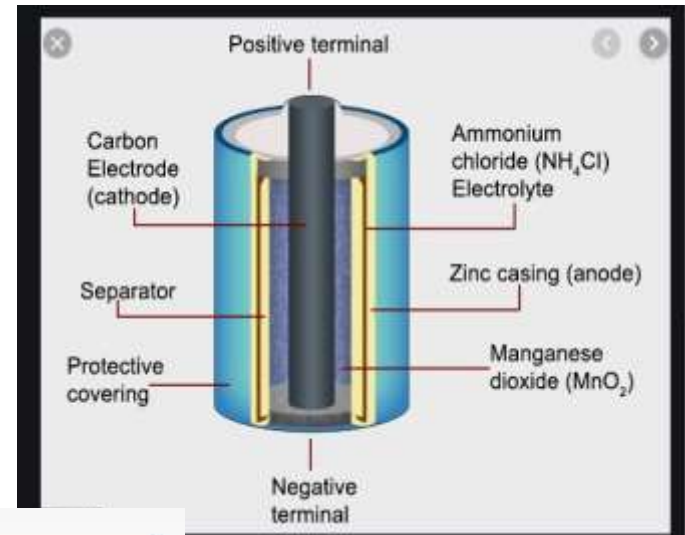
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Example of Cells



Button Cell



Dry Cell



Lead Storage Battery

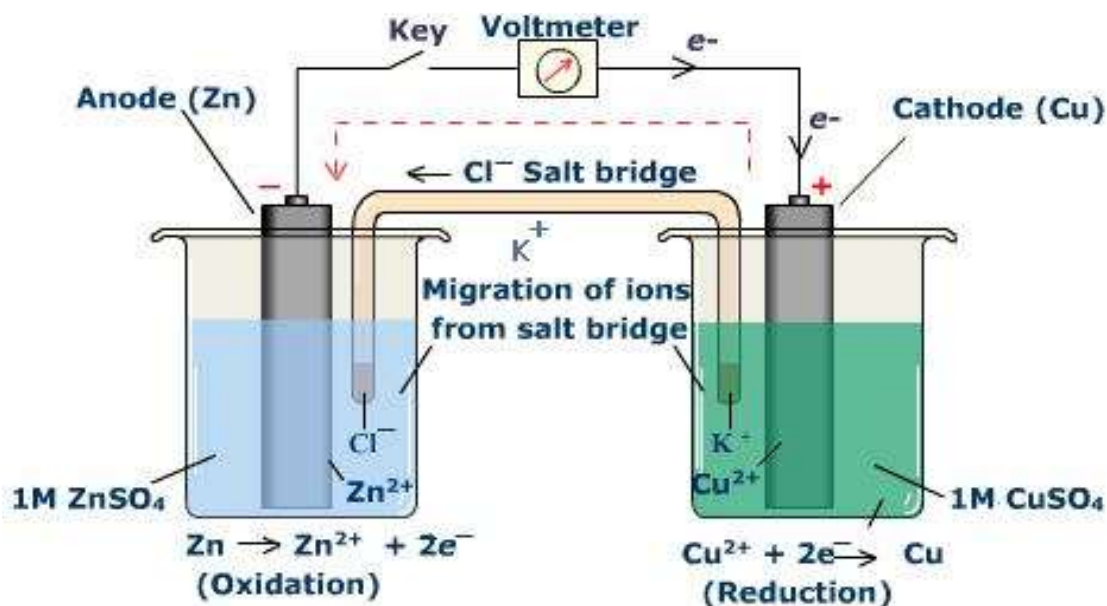
Students will be able to

:

- Describe the **mechanism** of generation of electric current in Galvanic cell.
- Calculate standard Emf of cell (E°_{Cell}) in different electrode system.
- Explain the significance of salt bridge in Galvanic cell.
- Explain the **spontaneity** of cell reaction.

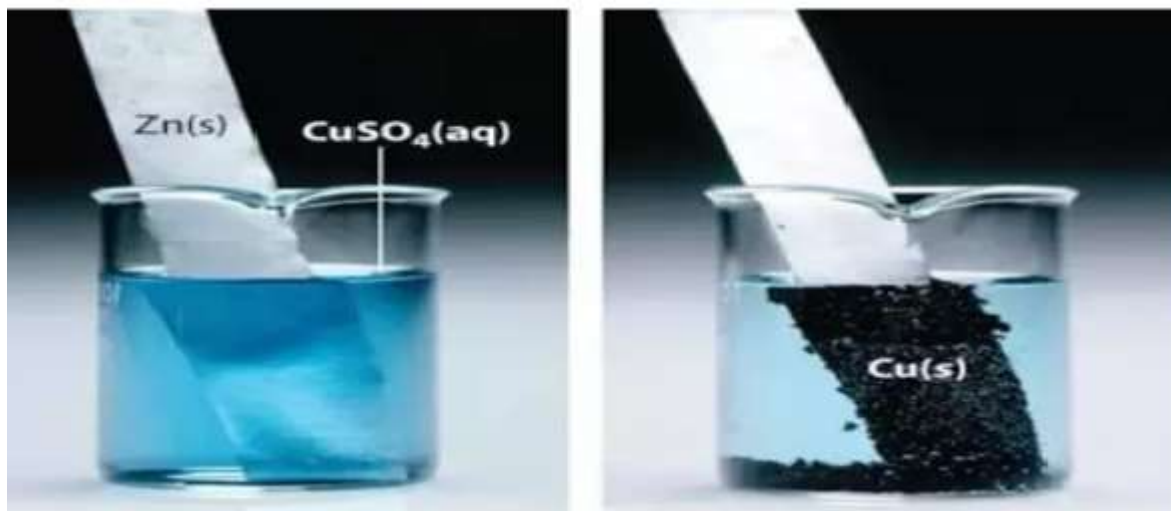
Galvanic cell

Definition: Electrochemical cell in which spontaneous electricity is generated by chemical reaction is called galvanic cell.



Idea of Galvanic cell

Experiment :Zinc rod is placed into copper sulphate solution.

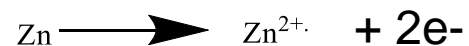


Observation

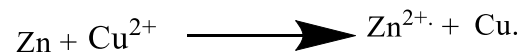
- ❖ Mass of zinc rod decreased.
- ❖ Blue colour of copper sulphate solution becomes fade.
- ❖ Reddish brown precipitate is deposited in the bottom of container.
- ❖ Temperature of solution increases.

Conclusion of Experiment :

(1) Zinc rod is oxidised into Zn^{2+} .

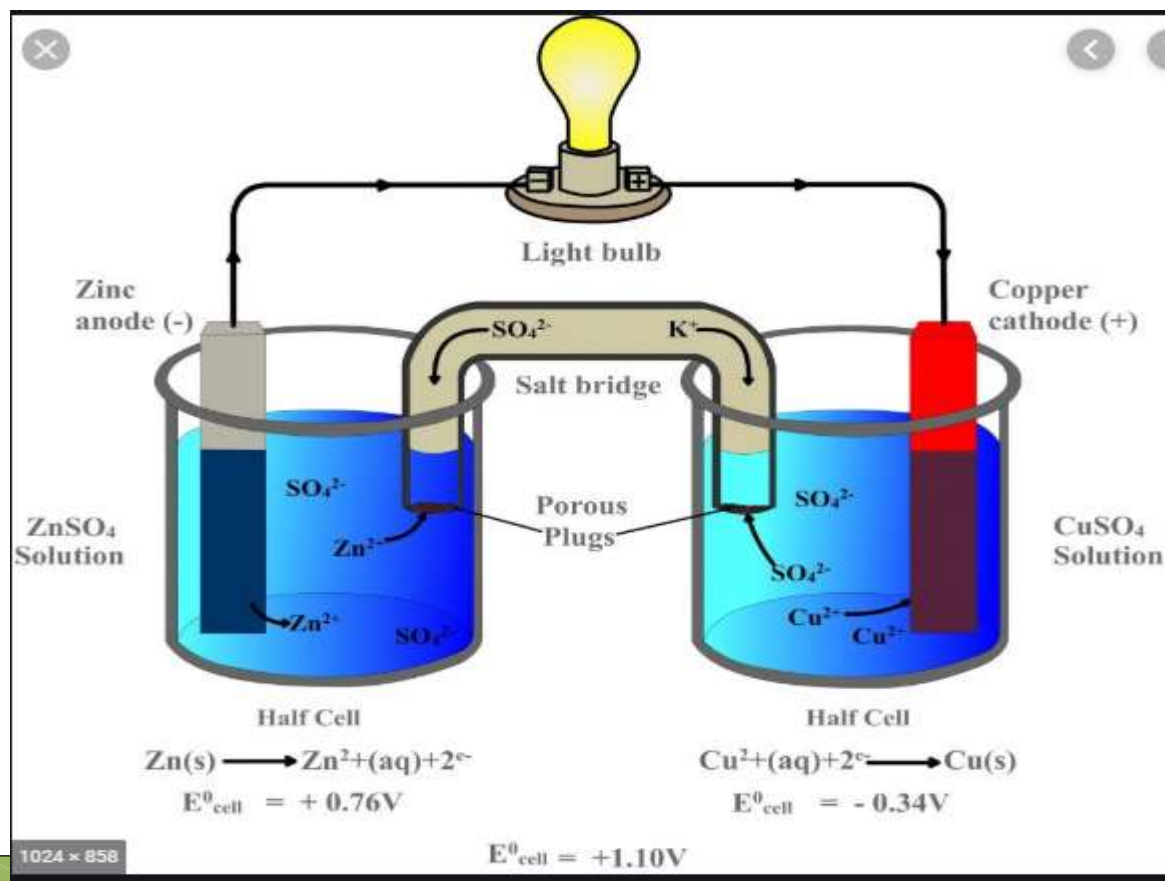


(2) Cu^{2+} is reduced into Cu.



Direct spontaneous redox
reaction

Indirect Redox Reaction



Standard Emf of cell: (E°_{Cell})

$E^{\circ}_{\text{Cell}} = \text{Oxidation potential of Anode} + \text{Reduction Potential of Cathode}$

$E^{\circ}_{\text{Cell}} = \text{Reduction Potential of Cathode} - \text{Reduction Potential of Anode}$

- For Spontaneous cell Reaction (E°_{Cell}) must be positive

Summary

In this session we have learned about:

- ❖ Idea of Galvanic cell
- ❖ Mechanism of generation of electricity in galvanic cell.
- ❖ Significance of salt bridge in galvanic cell.
- ❖ Calculation of standard emf E°_{Cell} of galvanic cell.

Assignment:

Q1. Explain the significance of salt bridge in galvanic cell.

Q2. Represent the galvanic cell of Copper and silver, Also write its cell reaction.

Q3. Calculate standard Emf of following galvanic cell

$\text{Cu}/\text{Cu}^{2+} // \text{Ag}^+ / \text{Ag}$

$E^\ominus \text{Cu}^{2+} / \text{Cu} = 0.80\text{V}$ $E^\ominus \text{Ag}^+ / \text{Ag} = 0.96\text{V}$

Q4. Explain the spontaneity of cell reaction.

Thank You