Electrochemistry

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1. The difference of potential between a metal rod and metal ions in solution when an electrode is placed in salt solution of its own ions is called **electrode potential.**
2. It is a difference of potential between metal and its ions in solution when a metal rod is dipped in 1M salt soln. of its own ions at a temp. of 298 K. (Standard Electrode Potential).
3. When SHE is connected to a half cell consisting of a less reactive metal electrode, SHE acts as anode and oxidation will take place on it.

→ When SHE is connected to a half cell consisting of a more reactive metal electrode, SHE acts as cathode and reduction will take place on it.

4. **Cell potential** or cell voltage E is the difference between the electrode potential of the two half cells.
5. **EMF** is equal to the difference between the electrode potential of the two half cells when no current is withdrawn from the cell.
6. Those substances which dissociates in aqueous solution or in molten state, thus conduct electric current are called **electrolytic conductors.**
7. **Resistance** (R) - Opposing force which opposes the flow of current through an electrolyte.

   Conductance (G) - It is the ease with which current flows through a conductor.

   Resistivity (ρ) - It is equal to the resistance of an electrolyte soln. having area of cross-section $1\ cm^2$ and length 1 cm.

   Conductivity (K) - It is equal to the conductance of an electrolyte soln. having area of cross-section $1\ cm^2$ and length 1 cm.
8. **Molar Conductance** (λ_m) - It is equal to the measured conductance of a solution containing 1 mole of electrolyte in $1\ cm^3$ of soln. filled between two electrodes which are 1 cm apart and the area of the electrode is so large that the complete solution comes in between them.

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→ **Equivalent Conductance (λ_{eq})** - It is equal to the measured conductance of a solution containing 1g equivalent of electrolyte in V cm^3 of solution filled in between two electrodes which are 1cm apart and the area of the electrode is so large that complete soln. comes in between them.

9. **Kohlrausch law**

At infinite dilution, each ion of electrolyte has definite contribution towards molar conductance of electrolyte irrespective of nature of ion. Thus, acc. to Kohlrausch law, the molar conductivity of an electrolyte at infinite dilution is always equal to ionic conductivity at infinite dilution of the cations and anions each multiplied by the no. of ions present in 1 formula unit of the electrolyte.

10. **Faraday's First Law**

Acc. to faraday the mass of substance deposited or liberated at electrodes is directly proportional to the quantity of charge passing through the circuit.

11. **Faraday's Second Law**

When two electrolytic cells are connected in series with each other such that the same quantity of charge passes through them, then the ratio of the mass liberated or deposited at the electrodes at the two cells will be equal to the ratio of their equivalent weights.