



## Introduction

Electrochemistry is the branch of science which deals with the relationship between chemical reaction and electricity.

### **Conductors**

A Substance or material that allows electric current to pass through it is called *conductor*

e.g All metals, graphite , fused salts, aqueous solution of acids, bases, etc.,

### **Non Conductor**

➤ Materials which do not conduct electric current are called *non-conductor* or *insulator*

e.g Plastics , wood most of the non metals, etc

**Type of conductor:** i) Metallic conductor (or) Electronic conductor ii) Electrolytic conductor

### **Metallic conductor (or) Electronic conductor**

- These conductor are solid substance which conduct electric current by moment of free electron from one end to another end
- The conduction decreases with increase of temperature. e.g. metals

### **Electrolytic conductor**

- Electrolytic conductors conduct electric current by free ions or moment of ions in solution.
- The conduction increases with increase of Temperature. e.g Acids, Bases & Ions

### **Types of Electrolytes**

**Strong Electrolytes:** Complete ionisable in dilute solution (e.g KCl, NaCl, NaOH, KOH)

**Weak Electrolytes:** Partially ionisable in dilute solution (e.g CH<sub>3</sub>COOH, NH<sub>4</sub>OH)

**Non Electrolytes:** These electrolytes do not ionisable in any solution (e.g glucose, sucrose)

### **Difference between Metallic Conductor & Electrolytic Conductor**

S.No	Metallic Conductor	Electrolytic Conductor
1	It involves only free electron in a conductor	It involves only free ions in a solution
2	It does not involve any transfer of matter	It involves transfer of electrolyte in the form of ions.
3	Conduction decreases with increase of Temperature	Conduction increases with increase of Temperature
4	No change in chemical properties of the conductor	Chemical reaction occur at the two electrodes



## **Fundamental components of electrochemical cell**

**Current:** Current is the flow of electrons through a wire or any conductor.

**Electrode:** Electrode is a material which conducts electrons.

**Anode:** oxidation half-reaction takes place; e.g..  $\text{Zn} \rightarrow \text{Zn}^{2+} + 2\text{e}^{-}$

The electron at the surface of the metal electrode.

**Cathode:** reduction half-reaction occurs; e.g..  $\text{Cu}^{2+} + 2\text{e}^{-} \rightarrow \text{Cu}$

- Movement of metal ions from the solution to the electrode to gain electrons in reduction.
- Oxidation of metal releases metal ions into the solution of oxidation half-cell.

**Electrolyte :** Internal conducting environment that allows ions to migrate between both half cells so as to preserve electro neutrality

**External circuit:** Two half-cells are joined together by wire through which electrons flow.

**Salt bridge / porous membrane:** Serves as a bridge to complete the electric circuit and maintain electro neutrality in the electrolyte.