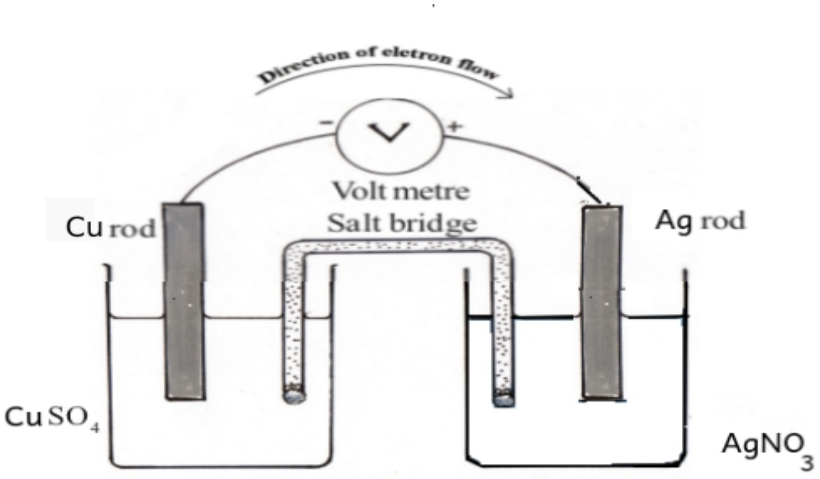
KITE VICTERS ONLINE CLASS - 15-10-2020

Chemistry- X- Unit -3. Class - 18

Galvanic cell

Cu-Ag cell



Take two beakers, one containing $CuSO_4$ solution and the second containing the same amount of $AgNO_3$ solution with the same concentration.

Dip **Cu** rod in $CuSO_4$ solution and **Ag** rod in $AgNO_3$ solution.

Connect a voltmeter as shown in the figure . Connect the two solutions using a salt bridge.

Cu loses two electrons and becomes Cu^{2+} and reaches the solution. The electrons liberated from Cu rod reaches the silver electrode through the external circuit and these electrons are received by silver ions in the solution changing them into silver.

Cu Electrode

$$Cu \rightarrow Cu^{2+} + 2e^- \quad \text{Oxidation , Anode}$$

The electrode at which oxidation occurs is the anode. Anode attains negative charge.

Ag Electrode $2Ag^+ + 2e^- \rightarrow 2Ag$ Reduction , Cathode

The electrode at which reduction occurs is the cathode . Cathode attains positive charge.

Redox reaction

$$Cu + 2Ag^{+} \rightarrow Cu^{2+} + 2Ag$$

Electrolytic cells

Here electric energy is converted in to chemical energy. An approximate figure showing electrolysis is given below.

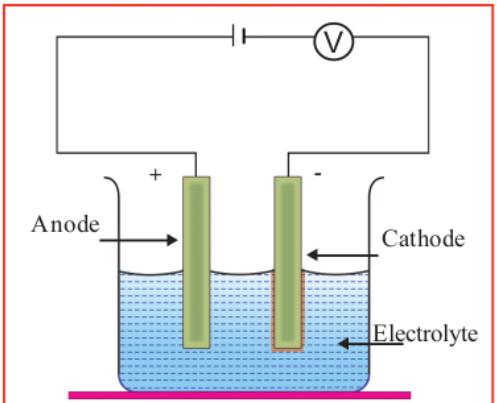


Figure 3.4

Electrolytes are substances which conduct electricity in molten states or in aqueous solutions and undergo chemical change

The process of chemical change taking place in an electrolyte by passing electricity is known as electrolysis.

The electrode which is connected to the negative terminal is the cathode. The electrode at which oxidation takes place is anode and electrode at which reduction take place is cathode.

Electrolysis of molten sodium chloride

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In molten sodium chloride , Na^+ as well as Cl^- ions are present. When we pass electricity through it, the positively charged Na^+ ions moves towards negatively charged cathode and negatively charged Cl^- ions moves towards positively charged anode.

Anode

$$Cl^- - 1e^- \rightarrow Cl$$

$$Cl + Cl \rightarrow Cl_2$$

Chlorine gas is liberated from anode

Cathode

$$Na^+ + 1e^- \rightarrow Na$$

Sodium gets deposited at cathode

Questions

1. Electrode at which reduction take place is.....
   (Anode ,Cathode)
2. What are the difference between galvanic cell and electrolytic cells ?
3. How many cells can be produced by using **Cu**,**Ag** , and **Zn**. Complete the Table by writing anode and cathode in each.

Cell	Anode	Cathode
• Zn - Cu • •		

4. Draw a **Cu**- **Ag** cell and mention the important parts such as anode, cathode, direction of electron flow

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