SSLC -Chemistry -Class -22

Unit 3: Reactivity series and Electrochemistry

Galvanic cell

Galvanic cell is an arrangement in which the difference in reactivity of metals is used to produce electricity.

Galvanic cell or voltaic cell is an arrangement in which chemical energy is converted into electrical energy by means of a redox reaction.

Zn-Cu cell

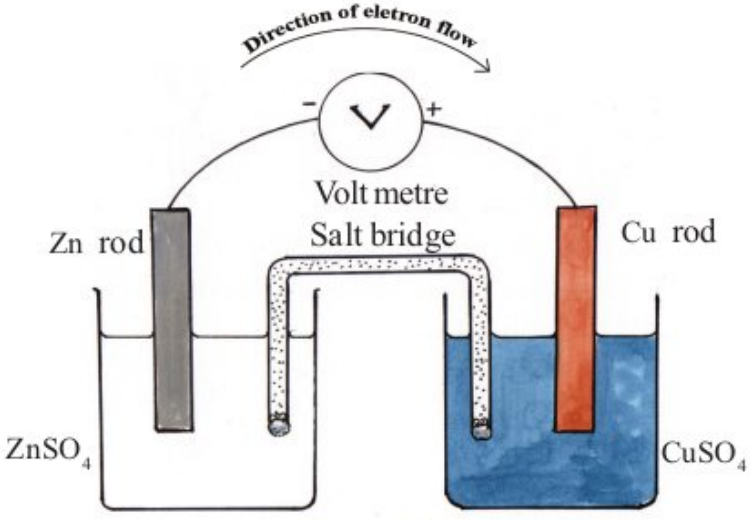

Figure 3.3

Take two beakers, one containing $ZnSO_4$ solution and the second containing the same amount of $CuSO_4$ solution with the same concentration.

Dip Zn rod in $ZnSO_4$ solution and Cu rod in $CuSO_4$ solution.

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

A long filter paper which is moistened with KCl solution can be used instead of salt bridge.

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

Zn Electrode

$Zn \rightarrow Zn^{2+} + 2e^-$ Oxidation , Anode

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

Cu Electrode

$Cu^{2+} + 2e^- \rightarrow Cu$ Reduction , Cathode

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

Redox reaction

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

Questions

1.The electrode at which oxidation occurs is known as.....

(Anode , Cathode)

2. What is the use of salt bridge which is used in galvanic cell ?

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

4 .A small Zinc rod is dipped in copper sulphate solution.

a) What happens to the colour of the solution ?

b) Write the chemical equation .

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