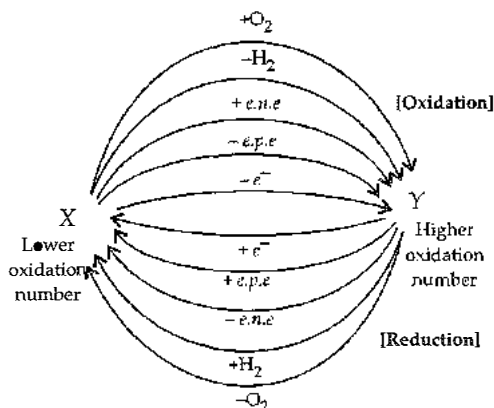


Unit 8

Redox Reactions

- Oxidation-reduction** : Several chemical reactions involve transfer of electrons from one chemical substance to another. These electron transfer reactions are termed as oxidation-reduction reactions or redox reactions.

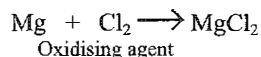
Old theories based on	Oxidation	Reduction
Oxygen	Addition of oxygen	Removal of oxygen
Hydrogen	Removal of hydrogen	Addition of hydrogen
Electronegative elements	Addition of electro-negative element	Removal of electro-negative element
Electropositive elements	Removal of electro-positive element	Addition of electro-positive element
New theories based on	Oxidation	Reduction
Electron	Loss of electrons	Gain of electrons
Oxidation number	Increase in oxidation number	Decrease in oxidation number



- Oxidising agents**: The substance which brings oxidation of other substance and gets itself reduced is known as oxidising agent. Thus, an oxidising agent provides oxygen or removes hydrogen or removes electrons from other substance.

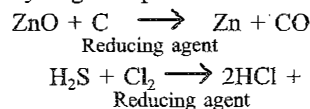
$$\text{S} + 6\text{HNO}_3 \longrightarrow \text{H}_2\text{SO}_4 + 2\text{H}_2\text{O} + 6\text{NO}_2$$

Oxidising agent



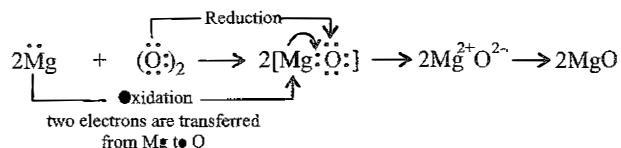
- Reducing agent** : The substance which brings reduction of other substance and gets itself oxidised is known as reducing agent.

Thus, a reducing agent removes oxygen or provides hydrogen or provides electrons to other substances.



REDOX REACTIONS

- A reaction in which electrons are transferred from one reactant to another is called redox reaction. Thus, a redox reaction involves both oxidation and reduction.

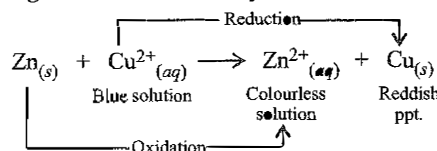


- Classification of redox reactions** : Redox reactions may be classified into the following two types:

(i) Direct redox reactions, (ii) Indirect redox reactions

> **Direct redox reaction**: A reaction in which the reacting species which is capable of losing electrons (reducing agent) and that capable of gaining electrons (oxidising agent) are present in the same solution is termed as direct redox reaction. In direct redox reactions, the electrons move through very short distances and randomly in all the directions. So, in direct redox reactions the net movement of electrons in any direction is zero.

e.g. Oxidation of Zn by Cu^{2+}



Oxidation of Fe^{2+} by KMnO_4

