



Redox Reactions: Types and its Importance

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Description

A redox reaction can be defined as a chemical reaction in which electrons are transferred between two participating reactants. This electron transfer can be detected by observing changes in the oxidation conditions of the reacting species.

Redox reactions appear as important processes involved in cell survival and proliferation. Redox products, enzymes and their mimics may be involved in controlling inflammation, cancer formation and spread, but also the growth of bacteria, fungi and microbials. It has become clear that controlling this reaction with various natural and synthetic products may be used for prevention and treatment.

Oxidation and reduction reactions always occur simultaneously in response to redox or Oxidation-Reduction reactions. The substance that reduces the chemical reaction is known as the oxidizing agent, and the substance that is oxidized is known as the reducing agent. The loss of electrons and the corresponding increase in the oxidation state of a given reactant is called oxidation. The electron gain and the corresponding decrease in the oxidation state of the reactant are called reduction.

Electron-accepting species which tend to undergo a reduction in redox reactions are called oxidizing agents. The type of electron donor you normally give to electrons can be called a reducing agent. These species often undergo oxidation. It can be noted that any redox reaction can be divided into two-phase reactions, namely half-oxidation reactions and half-reversal reactions.

Types of Redox Reactions

The different types of redox reactions are:

Decomposition Reaction: This kind of reaction involves

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the breakdown of a compound into different compounds.

Combination Reaction: This reaction is anti-decomposition and involves a combination of two compounds to form a single compound in the form of $A + B \rightarrow AB$.

Displacement Reaction: In this kind of reaction, an atom or an ion in a compound is replaced by an atom or an ion of another element. It can be represented in the form of $X + YZ \rightarrow XZ + Y$. Further displacement reaction can be categorized into;

- **Metal displacement Reaction:** In this type of reaction, the metal in the compound is replaced by another metal. These types of reactions find their use in metallurgical processes where pure metals are found in their ores.
- **Non-metal displacement Reaction:** In this type of reaction, we can experience hydrogen removal and sometimes a rare reaction that involves the release of oxygen.

Disproportionation Reaction: The reaction in which a single reactant is oxidized and reduced is known as Disproportionation reaction.

The reduction of oxidation (redox) is important because it is the main source of energy for this planet, both biological or biological and synthetic. Oxidation of molecules by releasing hydrogen or compounds with oxygen usually releases large amounts of energy.

Oxidation and reduction involve the release of electrons from molecules or ions of a single substance and their absorption by other chemical substances. Like the movement of all the molecules mentioned in the preceding paragraphs, free energy is the key to understanding this tendency. Redox reactions can occur relatively slowly, many reactions in organic chemistry are redox reactions due to changes in oxidation states but without distinct electron transfer.