

## Ch-1 Chemical Reactions and Equations

1. **Chemical reactions** – The transformation of chemical substance into a new chemical substance by making and breaking of bonds between different atoms is known as Chemical Reaction.
2. **Signs of a chemical reaction** – These factors denote that a chemical reaction has taken place- change of state of substance, change of color of substance, evolution of heat, absorption of heat, evolution of gas and evolution of light.
3. **Chemical Equation** – The representation of chemical reaction by means of symbols of substances in the form of formulae is called chemical equation. E.g. –  $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$
4. **Balanced Chemical Equation** – A balanced chemical equation has number atoms of each element equal on both left and right sides of the reaction.

**\*Note** – According to Law of Conservation of Mass, mass can neither be created nor destroyed in a chemical reaction. To obey this law, the total mass of elements present in reactants must be equal to the total mass of elements present in products.

5. **Types of Chemical Reactions** –
  - a. **Combination** – When two elements or one element and one compound or two compounds combines to give one single product.
  - b. **Decomposition** – Splitting of a compound into two or more simple products.
  - c. **Displacement** – It takes place when a more reactive metal displaces a less reactive metal.
  - d. **Double displacement** – Reactions in which ions are exchanged between two reactants forming new compounds are called double displacement reactions.
  - e. **Precipitation** – The insoluble compound called precipitate forms in this reaction.
  - f. **Exothermic** – Reactions which produce energy are called exothermic reaction. Most of the decomposition reactions are exothermic.
  - g. **Endothermic** – Reactions which absorb energy are called endothermic reaction. Most of the combination reactions are endothermic.
  - h. **Oxidation** – Gain of oxygen or removal of hydrogen or metallic element from a compound is known as oxidation.
  - i. **Reduction** – Addition of hydrogen or removal of oxygen from a compound is called reduction.
  - j. **Redox** – A chemical reaction where oxidation and reduction both take place simultaneously is known as redox reaction. Ex.,  $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
6. **Rusting** – When iron reacts with oxygen and moisture forms a red substance called rust.
7. **Rancidity** – Oils and fats when get oxidized on exposure to air show a change in taste and smell.
8. **Corrosion** – Metals when attacked by oxygen, water, acids, gases, present in air changes its surface which is called corrosion.