

CHEMICAL REACTIONS AND TYPES

A chemical reaction is a process where substances transform into new substances with different properties. It involves breaking old chemical bonds and forming new ones.

Types of Chemical Reactions

Here is the complete breakdown of the reactions in your syllabus:

1. Combination Reaction

Two or more reactants combine to form a single product.

General Form: $A + B \rightarrow AB$

Example: $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2$

2. Decomposition Reaction

A single reactant breaks down into two or more simpler products. This reaction requires energy and has three main subtypes:

Thermal Decomposition: Carried out by heating.

Example: $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$

Electrolytic Decomposition: Carried out by passing electricity.

Example: $2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$

Photolytic Decomposition: Carried out by light energy.

Example: $2\text{AgCl} \rightarrow 2\text{Ag} + \text{Cl}_2$

3. Displacement Reaction

A more reactive element displaces a less reactive element from its compound.

General Form: $A + BC \rightarrow AC + B$

Example: $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$

4. Double Displacement Reaction

Two compounds exchange ions to form two new compounds.

General Form: $AB + CD \rightarrow AD + CB$

Example: $Na_2SO_4 + BaCl_2 \rightarrow BaSO_4 + 2NaCl$

Precipitation Reaction: A reaction that produces an insoluble solid (precipitate).

Example: $BaSO_4$ formed above is a white precipitate.

Neutralisation Reaction: An acid reacts with a base to form salt and water.

Example: $HCl + NaOH \rightarrow NaCl + H_2O$

5. Redox Reaction (Oxidation-Reduction)

A reaction where both oxidation and reduction take place simultaneously.

Oxidation: Gain of oxygen or loss of hydrogen.

Reduction: Loss of oxygen or gain of hydrogen.

Example: $CuO + H_2 \rightarrow Cu + H_2O$

CuO is reduced to Cu .

H_2 is oxidised to H_2O .