

Chemical Reactions & Equations

Types of Chemical Reactions

TYPES OF CHEMICAL REACTIONS:

(a) Addition Reactions:

It is a union of two or more than two substances to form a new substance. It may be brought about by the application of heat, light electricity or pressure.

For eg. $\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$

In the above example H_2 and Cl_2 two elements combine to form hydrogen chloride.

Addition reactions may be formed in the following conditions –

- (i) When two or more elements combine to form a new compound.

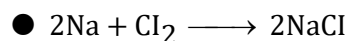
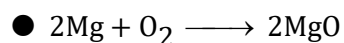
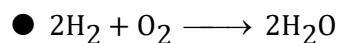
Synthesis reaction: It is a type of addition reaction in which a new substance is formed by the union of its component elements.

For eg. $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$ (Haber's Process)

Ammonia is synthesised from its components, nitrogen and hydrogen, so it is a synthetic reaction.

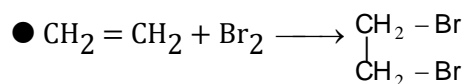
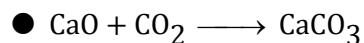
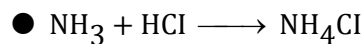
- All synthesis reactions are addition reactions but all addition reactions are not synthesis reactions.

Other Example of synthesis reactions are -



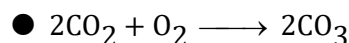
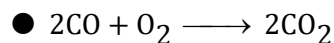
(ii) When two or more compounds combine to form a new compound.

For eg.



(iii) When an element and a compound combine to form a new compound.

For eg.



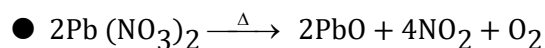
➤ Only single substance is formed as a product in the addition reactions.

(b) Decomposition Reaction:

It is breaking up of a substance into simpler compounds and it may be brought about by the application of heat, light, electricity etc.

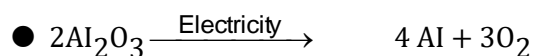
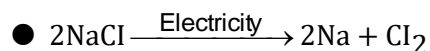
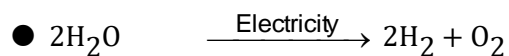
(i) A decomposition reaction brought by heat is known as thermal decomposition.

For eg.



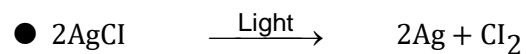
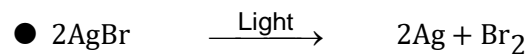
(ii) Decomposition performed by electricity is known as electrolysis.

For eg.



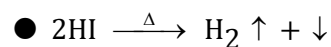
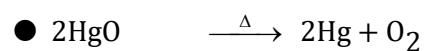
(iii) A decomposition reaction brought by light is known as photo decomposition.

For eg.



(iv) Decomposition reaction in which a compound decomposes into its elements is known as analysis reaction.

For eg.



All analysis reactions are decomposition reactions, but all decomposition reactions are not analysis reactions.

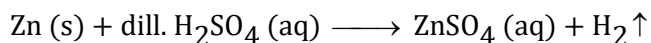
➤ **Decomposition reaction is just opposite of the addition reaction.**

(c) Displacement Reactions :

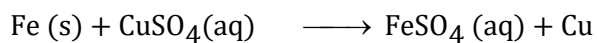
It involves displacement of one of the constituents of a compound by another substance and may be regarded as a displacement reaction.

For eg.

(i) Zinc displaces hydrogen from sulphuric acid.



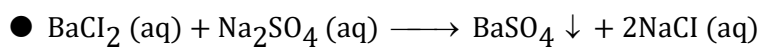
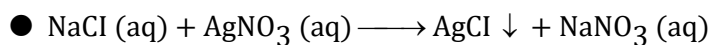
(ii) Iron displaces copper from a copper sulphate solution.



➤ **In general a more reactive element displaces a less reactive element from the soluble solution of its salt.**

(d) Double Displacement:

It is mutual exchange of the radicals of two compounds taking part in the reaction and results in the formation of two new compounds.



➤ **Acid base neutralisation reactions are double displacement reactions.**