

CHEMISTRY

CH – 1

Chemical Reaction and Equation

Ques: Define chemical reaction.

Ans. When two substances react with each other to give product, it is known as chemical reaction.

Ques: What are the indications that chemical reaction has taken place?

Ans. 1) Change in state

2) Change in temperature

3) Change in colour

4) Evolution of gas

Ques: Define chemical equation.

Ans. When chemical reaction is expressed in symbolic form, it is called chemical equation.

For eg: $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$

* Balancing Chemical Equation

- In balancing chemical equation no. of atoms on right hand side should be equal to no. of atoms on left hand side.

For eg: $4\text{Na} + \text{O}_2 \rightarrow 2\text{Na}_2\text{O}$ [sodium oxide]

$2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$ [water molecule]

$3\text{Fe} + 4\text{H}_2\text{O} \rightarrow \text{Fe}_3\text{O}_4 + 4\text{H}_2$ [ferroso-ferrous oxide]

$\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$ [ammonia]

$\text{Na}_2\text{CO}_3 + 2\text{HCl} \rightarrow 2\text{NaCl} + \text{CO}_2 + \text{H}_2\text{O}$ [sodium chloride]

$2\text{KOH} + \text{H}_2\text{SO}_4 \rightarrow \text{K}_2\text{SO}_4 + 2\text{H}_2\text{O}$ [pottassium sulphate]

$2\text{FeSO}_4 \rightarrow \text{Fe}_2\text{O}_3 + \text{SO}_2 + \text{SO}_3$ [ferrous sulphate]

* Types of Chemical Equation

- Combination Reaction:** When two or more reactants combine to give a single product, the reaction is known as combination reaction.

For eg: $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$

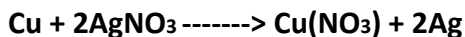
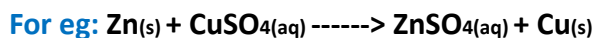
$\text{C} + \text{O}_2 \rightarrow \text{CO}_2$

- Decomposition Reaction:** The reaction in which the reactant breaks to give two or more products known as decomposition reaction. For eg:

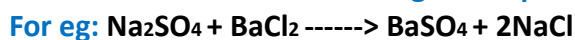
$\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$



- 3. Displacement Reaction:** The reaction in which more reactive metal displaces less reactive metal from its salt solution is known as displacement reaction.



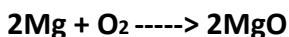
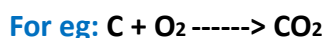
- 4. Double Displacement Reaction:** In this reaction, the ions present in the salt solution will exchange their position.



- 5. Oxidation & Reduction [Redox] :** The substance upon reaction combines with oxygen is called oxidation.

Or

The substance from which hydrogen is released is called oxidation.



When the substance combines with hydrogen it is called reduction.

Or

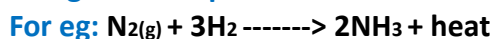
When the substance release oxygen upon reaction it is called reduction.

NOTE: In a chemical reaction, both oxidation and reduction takes place simultaneously. Such reactions are called redox reaction.

- 6. Precipitation Reaction:** When two solutions are mixed, upon mixing when solid formation takes place, it is called precipitation reaction. For eg:



- 7. Exothermic Reaction:** The reaction in which heat is liberated/released along with the products is called exothermic reaction.



- 8. Endothermic Reaction:** The reaction in which heat is absorb when the products are formed is caled endothermic reaction.



- 9. Photo Chemical Reaction:** The reaction which takes place in presence of light is known as photo chemical reaction.



* Corrosion:

1. When metal combines with oxygen in presence of moisture it is said to undergo corrosion.
2. When iron combines with oxygen it is called rusting.
3. Formula of rusting: $\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$
4. Value of X depends on humidit.
5. The colour of rust is brown.

* Rancidity:

1. When fats or oily substance react with oxygen they became rancid.
2. Keeping food in air tight container slow down the process of oxidation.
- 3.

Packets of potato chips are flushed with N_2 gas.

NCERT EXERCISES