



CHAPTER-1 CHEMICAL REACTION AND EQUATIONS

Chemical reaction

The process in which new substances with new properties are formed from one or more substances is called Chemical Reaction.

A chemical reaction involves:

- Change in state or colour
- Change in temperature
- Evolution of gas
- Formation of precipitate

Examples:

- i. Digestion of food
- ii. Respiration
- iii. Rusting of iron
- iv. Burning of Magnesium ribbon
- v. Formation of curd

Aqueous solution

It is a solution in which solvent is water.

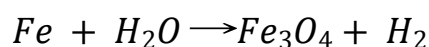
Chemical equation-

A chemical equation is the symbolic representation of a chemical reaction in the form of symbols and formulae, wherein the reactant entities are given on the left-hand side and the product entities on the right-hand side.

- The substances that take part in a chemical reaction are called Reactants.
- The substances, which are formed in a chemical reaction, is called Products.

Balancing chemical equation

Step 1. Write a chemical equation and draw boxes around each formula.



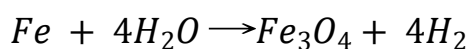
- Do not change anything inside the box.



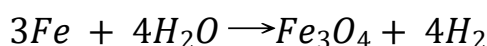
Step 2. Count the number of atoms of each element on both sides of the chemical equation.

Element	No. of atoms at reactant side	No. of atoms at the product side
Fe	1	3
H	2	2
O	1	4

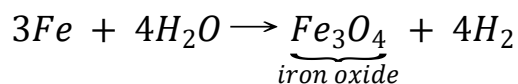
Step 3. Equalize the number of atoms of an element that has a maximum number by putting them in front of it.



Step 4. Try to equalize all the atoms of the element on the reactant and product side by adding coefficient in front of it.



Step 5. Write the physical state of reactants and product.



Solid state = (s)

liquide state = (l)

Gaseous state = (g)

aqueous state = (aq)

Step 6. Write the necessary condition of temperature, pressure, or catalyst on the arrow above or below.

TYPES OF CHEMICAL REACTIONS

1. Combination reaction
2. Decomposition reaction
 - a. Thermal decomposition
 - b. Electrolytic decomposition
 - c. Photolytic decomposition
3. Displacement reaction

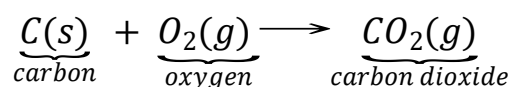


4. Double displacement
5. Oxidation and reduction
6. Exothermic reaction
7. Endothermic reaction

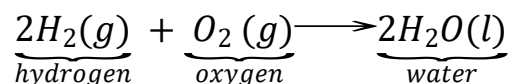
COMBINATION REACTION:

The reaction in which two or more reactants combine to form a single product.

- 1) Burning of coal



- 2) Formation of water



- 3) $\underbrace{CaO(s)}_{\text{calcium oxide or quick lime}} + \underbrace{H_2O(l)}_{\text{water}} \longrightarrow \underbrace{Ca(OH)_2}_{\text{calcium hydroxide or Slaked lime}} (aq) + \text{heat}$

DECOMPOSITION REACTION:

A reaction in which a single reactant breaks down to form two or more products, is known as decomposition reaction.



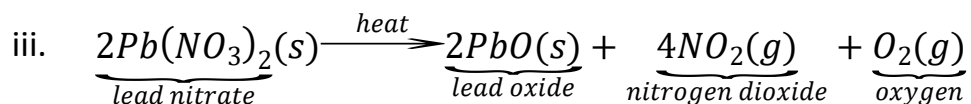
Decomposition reaction is three types

Thermal decomposition:

These reactions involve the use of energy in the form of heat for decomposition of the reactant.

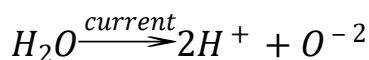
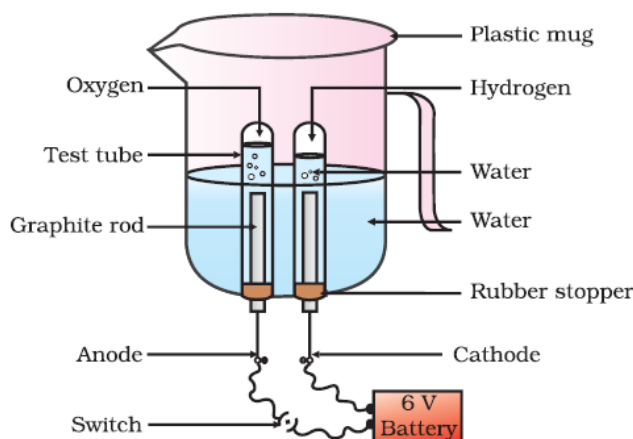
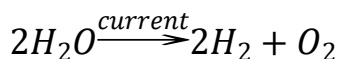
- $\underbrace{2FeSO_4(s)}_{\text{ferrous sulphate (green colour)}} \xrightarrow{\text{heat}} \underbrace{Fe_2O_3(s)}_{\text{(ferric oxide) red - brown colour}} + \underbrace{SO_2(g)}_{\text{sulphur dioxide}} + \underbrace{SO_3(g)}_{\text{sulphur trioxide}}$
- $\underbrace{CaCO_3(s)}_{\text{calcium carbonate (Lime stone)}} \xrightarrow{\text{heat}} \underbrace{CaO(s)}_{\text{(Quick lime)}} + \underbrace{CO_2(g)}_{\text{carbon dioxide}}$

Calcium oxide is called lime or quick lime. It has many uses one is in manufacture of cement



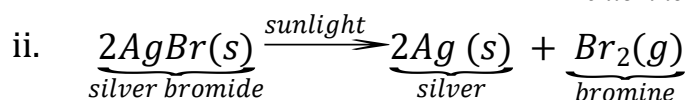
Electrolytic Decomposition:

These reactions involve the use of electrical energy required for the decomposition of the reactant molecules.



Photolytic Decomposition:

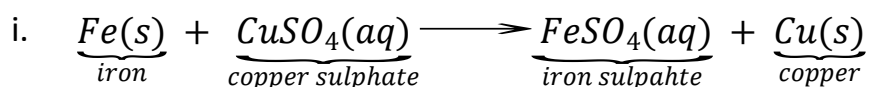
These reactions involve the use of light energy for the purpose of decomposition.



The above reaction is used in black & white photography.

DISPLACEMENT REACTION:

The chemical reaction in which a more reactive element displaces a less reactive element from its salt solution.





www.futureclassesan.com

This pdf contains half chapter. To download the complete chapter, visit our website

www.futureclassesan.com