

Chapter - 1

Chemical Reaction & Equations

Chemical Reaction

It is a process in which one or more substances formed new substances.
& it can't be reversed by physical methods.

Chemical Reaction involves

- change in states
- change in colour
- change in temperature
- Evolution of Gas.

Chemical Reaction can't be reversed by the physical methods. :-

- → Magnetism
- → Filtration
- → Centrifugation
- → Distillation
- → Evaporation.

Chemical Reaction happens in our daily life :-

- (i) Digestion of food
- (ii) Respiration
- (iii) Rusting of iron
- (iv) Formation of curd

Reactants → Who take part in chemical reaction

Products → The substance which are formed in a chemical reaction.

exp. - When Magnesium Ribbon burns in air (oxygen) gives us Magnesium oxide

Chemical Equation, A chemical Reaction can be represented by chemical equation it involves uses of symbols of substances of reactants & products with mention of physical state.

Solid \longrightarrow (s)

Liquid \longrightarrow (l)

Gaseous \longrightarrow (g)

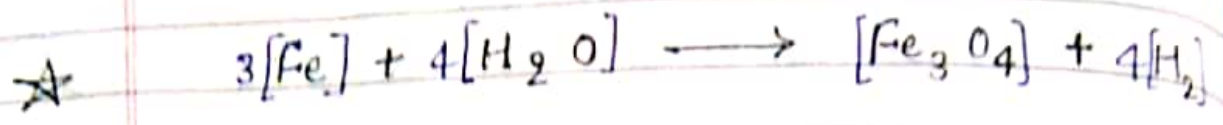
Aqueous \longrightarrow (aq)

Magnesium Ribbon burnt in air (oxygen) gives us Magnesium oxide.

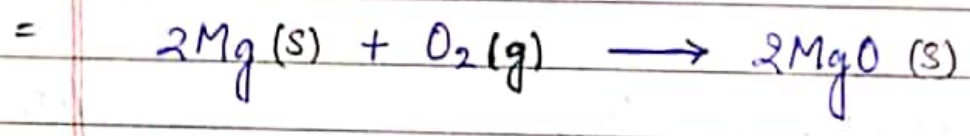
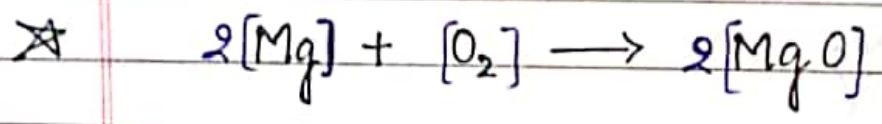
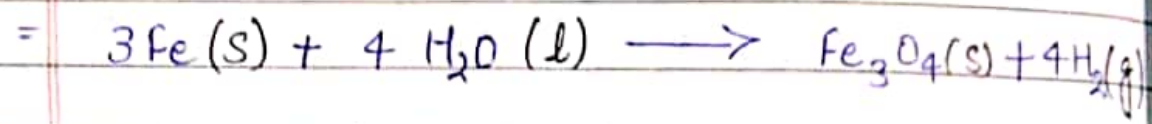
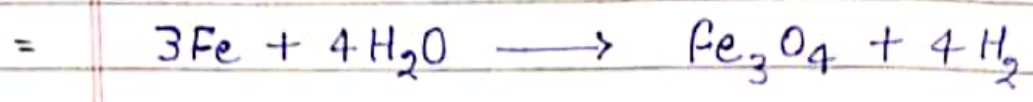


Aqueous Solution, — It is a solution in which solvent is water.

How to balance a chemical Equation.



Element	Reactant	Product
Fe	$1 \times 3 = 3$	3
H	$2 \times 4 = 8$	$2 \times 4 = 8$
O	$1 \times 4 = 4$	4



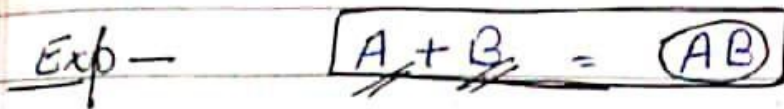
Why do we need to balance a chemical Reaction? :-

- Law of Conservation of mass — matter can neither be created or nor be destroyed in a chemical Reaction.
- Law of conservation of mass — No. of elements involve in chemical Reaction should remain same at reactant & product side.

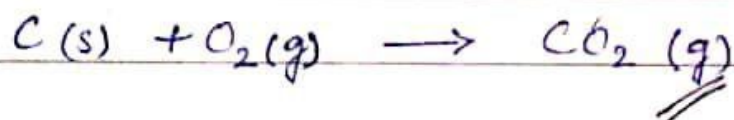
Types of a chemical Reaction :-

1. Combination Reaction :-

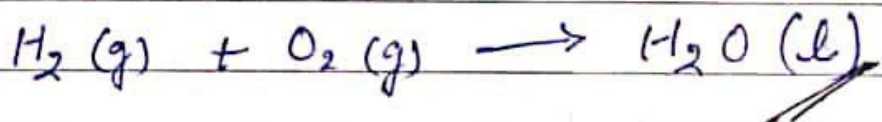
The reaction in which two or more reactants combine to form a single product.



(i) Burning of coal



(ii) Formation of water

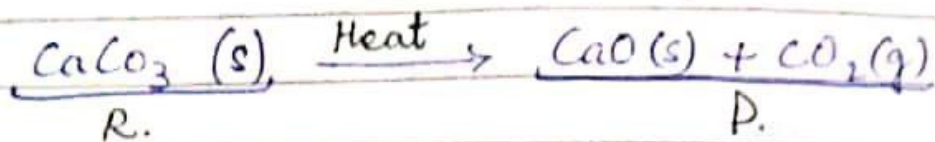


2. Decomposition Reaction :-

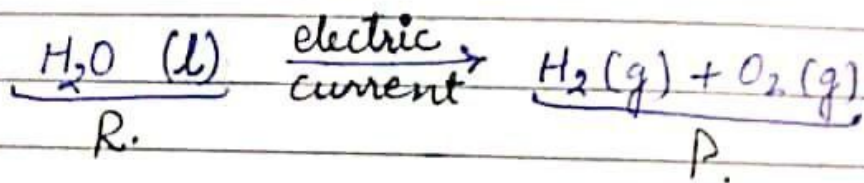
In this reaction a compound splits into two or more substances is called decomposition Reaction.

- $A \rightarrow B + C$
- Thermal Decomposition
- Electrolytic Decomposition
- Photolytic Decomposition

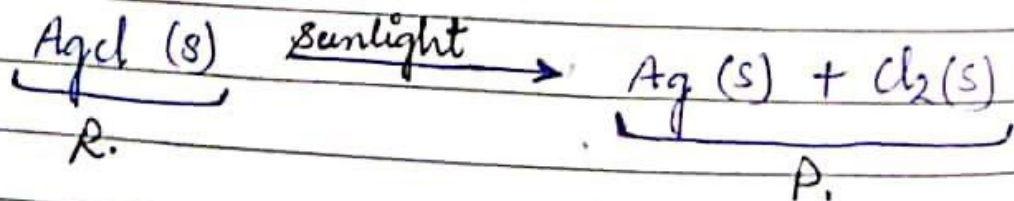
- Thermal decomposition — When, the decomposition is carried out by heating.



- Electrolytic decomposition — When, the decomposition is carried out ~~by~~ by passing electricity.



- Photolysis decomposition — When, the decomposition is carried out in presence of sunlight.



Above reaction is used in black & white photography.

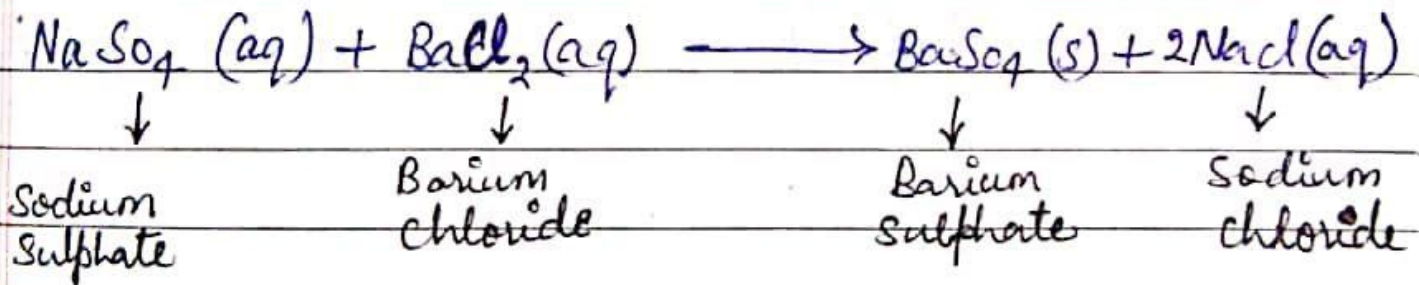
3. Displacement Reaction :-

The reaction in which more reactive element displaces less reactive element from its solutions.



4. Double Displacement Reaction :-

A reaction in which new compounds are formed by ~~mutual~~^{mutual} exchange of ions between two compounds.

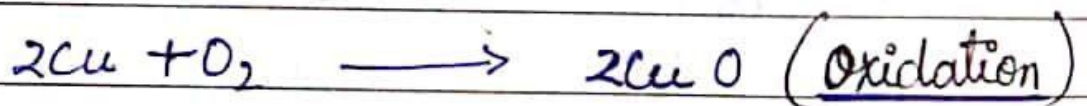


Precipitate :- It is an insoluble solid that emerges from a liquid solution

5. Oxidation & Reduction, :-

Oxidation - \star The addition of oxygen to substance \star The removal of hydrogen from a substance.

Reduction - \star The addition of hydrogen to substance \star The removal of oxygen from a substance.



Effects of Oxidation in daily life

(i) Corrosion — When a metal is exposed to substance such as moisture, air, water, acid etc for some time, a layer of oxide is formed which weakens the metal hence metal said to be corrode

Ex. → Rusting of iron

→ Black coating on silver

→ Green coating on copper

(ii) Rancidity — The oxidation of fats & oils when exposed to air is known as rancidity. It leads to bad smell & bad taste of food.

Chemical Reaction also classify on the basis of temperature :-

Exothermic Reaction — Reaction in which heat is released along with formation of product called exothermic reactions

Ex. Burning of Natural gas.



Endothermic Reaction — The reaction which requires energy in the form of Heat, light & Electricity called endothermic Reaction