Chemical Reaction : Process in which matter whether change its state or colour or evolve gas or change its temperature.

Chemical Equation : To write the reaction in the form of equation.

Magnesium + Oxygen ⟶ Magnesium oxide
(Reactant) (Reactant) (Product)

Shows the direction of reaction

- **Balancing Chemical Equation** : Like the reaction $N_2 + H_2 \longrightarrow NH_3$

The amount of Nitrogen and Hydrogen in reactant is not equal to in product. So to balance it first take the chemical equation : $N_2 + H_2 \longrightarrow NH_3$

Then lets take consider the amount of Nitrogen on both sides. Here Left side has 2 whether right side has only 1, so multiply 2 with the product. Now the equation will become

$N_2 + H_2 \longrightarrow 2NH_3$ (Donot write $(NH_3)_2$)

Now Hydrogen on Left side is 2 and right side is 6. So multiply H_2 by 3.

Therefore, $N_2 + 3H_2 \longrightarrow 2NH_3$. Now the equation is balanced.

Types of reaction :

- **Combination reaction** : Reactants combine with each other to form single product. It is exothermic (energy or heat is released) reaction. eg. $CaO_{(s)} + H_2O_{(l)} \longrightarrow Ca(OH)_{2\,aq}$ (Quick lime) (Slaked lime)
- **Decomposition reaction** : Single reactant decomposed to other products. It is endothermic (energy is taken) reaction. eg. $CaCO_{3\,(s)} \xrightarrow{Heat} CaO_{(s)} + CO_{2\,(g)}$ (Lime stone) (Quick lime)
- **Displacement reaction** : One element displace another element from its compound. eg. $Fe_{(s)} + CuSO_{4\,(aq)} \longrightarrow FeSO_{4\,(aq)} + Cu_{(s)}$ (Copper sulphate) (Iron sulphate)

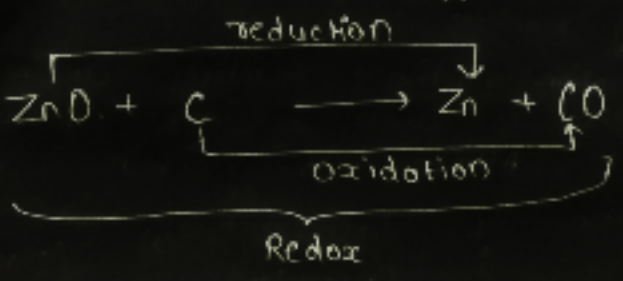
- **Double Displacement Rax Reaction** : The reaction in which elements displaces each other from their own compounds.

$$\underset{\text{(Sodium Sulphate)}}{Na_2SO_4\,(aq)} + \underset{\text{(Barium Chloride)}}{BaCl_2\,(aq)} \longrightarrow \underset{\text{(Barium Sulphate)}}{BaSO_4\,(s)} + \underset{\text{(Sodium Chloride)}}{2\,NaCl\,(aq)}$$

Here $BaSO_4$ is a white precipitate (not soluble in water), therefore this reaction is also called precipitation reaction.

- **Oxidation and Reduction** : Redox Oxidation + Reduction ⟶ Redox (oxidation and reduction simultaneously)

eg:



Oxidation ↓ gain oxygen or losses hydrogen

Reduction ↓ gain Hydrogen or losses Oxygen

Effects of Oxidation :

- **Corrosion** : Metal get oxidised with atmospheric oxygen making them weak. Like iron reacts with atmospheric oxygen and moisture ~~and converts~~ ~~Fe to~~ ~~into~~ reddish for some time and have reddish brown powder coated on it called rusting of iron. Corrosion causes severe damages to car, bridges, ships, iron railings etc.

- **Rancidity** : Oxidation of fats and oil under is called Rancidity. This process makes changes the smell and taste of food product. Antioxidants are used to prevent rancidity.