B.SC-I (H+S), Paper-IA,

Chemical equilibrium

Reversible reaction — When products formed in a chemical reaction reacts to form reactants, the chemical reaction is called reversible reaction. It occurs in ~~infinite~~ infinitesimilar steps and never tends to completion.

Examples

$$I_2 + H_2 \rightleftharpoons 2HI$$

$$3Fe_{(s)} + 4H_2O_{(g)} \rightleftharpoons Fe_3O_4(s) + 4H_2(g)$$

Irreversible reaction :— The chemical reaction in which products formed do not reacts to back reactant is called irreversible reaction. It occurs in one step.

$$2KClO_3 \longrightarrow 2KCl + 3O_2$$

Chemical equilibrium :—

A chemical equilibrium is defined as a dynamic equilibrium at which forward reaction rate is equal to backward reaction rate and at any instant of time reactant and product are found.

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Characteristics of chemical equilibrium :-

(1) Chemical equilibrium is dynamic in nature and not static in nature. Rate of formation of product and rate of i.e forward reaction and rate of conversion of products into reactant i.e backward reaction are always in dynamic and they are same at chequilibrium.

(2) (i) At constant temperature, certain observable properties like pressure, concentration, density or colour remain unchanged at equilibrium.

(ii) Catalyst does not affect the final state of the equilibrium. However, it enables the system to attain equilibrium state ealier by providing an alternative path which involve lower energy of activation.

(iii) It is reached only if process is carried out in closed vessels.