Chemical Equilibrium

For
B.Sc Chemistry(Part-I)
Physical Chemistry
Paper-IA
Lecture-01

By
Dr. Supriya kumari
Sher Shah College, Sasaram
V.K.S.U,Ara
supriyachemu@gmail.com

Reversible reaction

Reversible chemical reactions

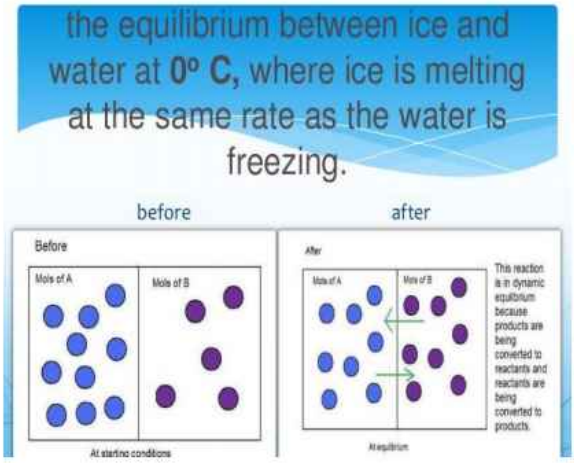
- It can occur in both directions Denoted by
- infinite changes can occur in the system
- The reactants can change to the products, and the products can also change back to the reactants.
- As the reactants react with other reactants to form products, the products are reacting with other products to form reactants i.e product donot react to form the reactant
- Equilibrium between initial and final state of the system

Irreversible reaction

Irreversible chemical reactions

- It can occur in only one direction Denoted by $\longrightarrow$
- Finite changes can occur in the system
- The reactants can change to the products, but the products cannot change back to the reactants.
- Irreversible reactions only proceed in one direction, so the reaction can never be at equilibrium.
- No equilibrium in the system

Reversible and irreversible reaction



Reversible reaction

Example:

$N_2 + O_2 \rightleftharpoons 2NO$

$2SO_2 + O_2 \rightleftharpoons 2SO_3$

$NH4Cl \rightleftharpoons NH_3 + HCl$

$N_2 + 3H_2 \rightleftharpoons 2NH_3$

Irreversible reaction

Example:

$2Na(s) + 2H_2O(l) \rightarrow 2NaOH(aq) + H_2(g)$

$HCl(aq) + H_2O(l) \rightarrow H_3O^+(aq) + Cl^-(aq)$

$2Mg(s) + O_2(g) \rightarrow 2MgO(s)$

$Cl_2(g) + 2OH^-(aq) \rightarrow ClO^-(aq) + Cl^-(aq) + H_2O(l)$