

Adsorption

It is the process of accumulation of molecular species (**adsorbate**) at the surface (**adsorbent**) rather than in the bulk of a solid or liquid

E.g. water molecules get adsorbed on the surface of the silica gel

Desorption

It is the process of removing an adsorbed substance from the surface

Sorption

It is referred to the condition where both adsorption and absorption take place simultaneously

Physisorption

Molecules are held by weak van der Waals' forces
It lacks specificity
It is generally reversible
Forms multimolecular layers
Enthalpy of adsorption is quite low ($20-40 \text{ kJ mol}^{-1}$)

Chemisorption

Molecules are held by chemical bonds (covalent or ionic)
It is highly specific
Generally irreversible in nature
Forms unimolecular layer
Enthalpy of adsorption is high ($80-240 \text{ kJ mol}^{-1}$)

Freundlich Adsorption Isotherm

It tells about the variation in the quantity of gas adsorbed by adsorbent with pressure at a constant temperature
 $\log x/m = \log k + 1/n (\log p)$
The plot of x/m vs pressure

Promoters

Substances that enhance the activity of a catalyst

E.g. Mo acts as a promoter for Fe which is used as a catalyst in the Haber's process

Poisons

Substances that decrease the activity of a catalyst

E.g. Lindlar's catalysts are poisoned by lead acetate, Ziegler-Natta catalysts are poisoned by water and oxygen

Shape-selective Catalysis

In this, the catalytic reaction depends upon the pore structure of the catalyst and the size of the reactant and product molecules

E.g. Zeolites (aluminosilicates) with a honey-comb like structures

Sols

Solids in liquids

Dispersed phase - solids
Dispersion medium - liquids

E.g. paints

Gels

Liquids in solids

Dispersed phase - liquids
Dispersion medium - solids

E.g. Cheese

Emulsions

Liquids in liquids

Dispersed phase - liquids
Dispersion medium - liquids

Oil in water type emulsions
e.g., milk

Water in oil type emulsions
e.g., butter

Lyophilic Colloids

Liquid-loving colloids

Reversible sols

Quite stable and cannot coagulate easily

Lyophobic Colloids

Liquid-hating colloids

Irreversible sols

Not stable and readily coagulate. Require stabilising agents for preservation

Micelles

Associated colloids

Form aggregates at higher concentrations and show colloidal behaviour

Kraft temperature (T_k) - the temperature above which the formation of micelles takes place

Critical micelle concentration (CMC) - the concentration above which the formation of micelles takes place