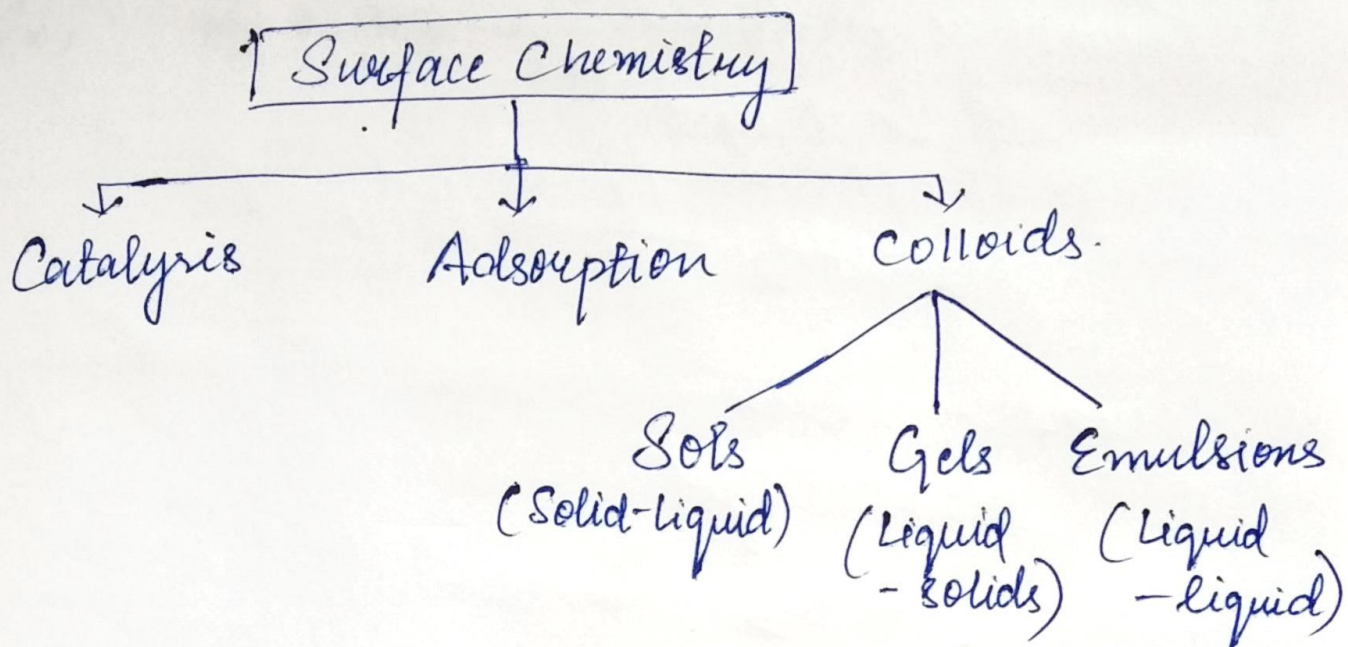


# Surface Chemistry

Surface Chemistry deals with phenomena that occurs at the surfaces or interfaces.

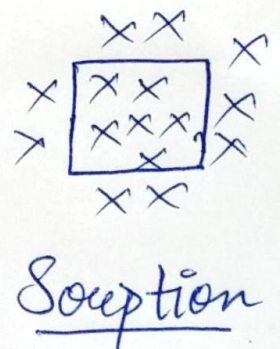
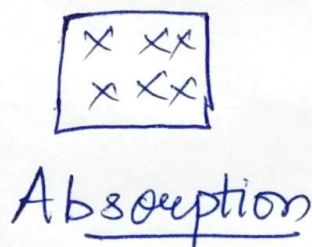
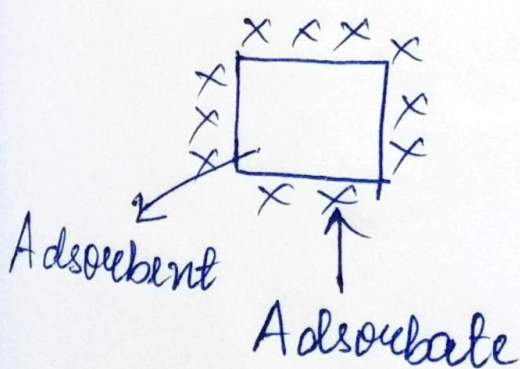
\* The interface or surface is represented by separating the bulk phases by a hyphen or a slash.

Ex, interface between a solid and a gas may be represented by solid-gas or solid/gas.



1) Adsorption :-

The accumulation of molecular species at the surface, rather than in the bulk of a solid or liquid is termed as adsorption.



Adsorption

## Adsorption mechanism

$$\Delta H < 0$$

$$\Delta S < 0$$

To be spontaneous,  $\Delta G < 0$

There are two types of adsorption:-

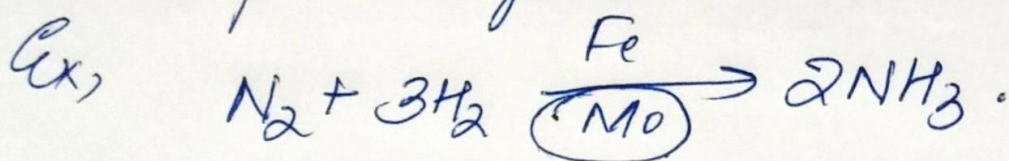
- i) Physisorption      ii) Chemisorption.

## \* 2) Catalysis:-

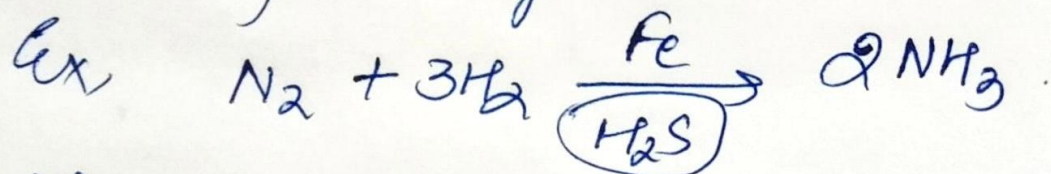
Substances which accelerate the rate of chemical ~~equation~~ reaction and themselves remain chemically and quantitatively unchanged after the reaction is known as catalyst.

The phenomenon of catalyst is known as catalysis.

- Promoters :- which enhances the activity of catalyst.



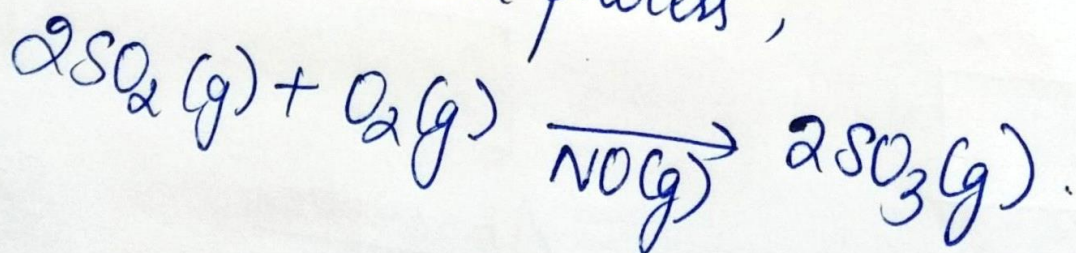
- Poisons :- which decreases the activity of catalyst.



## \* Types of Catalysis:-

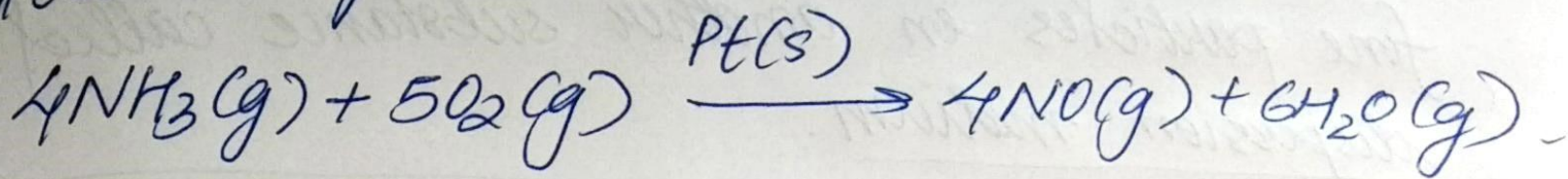
- a) Homogeneous :- Reactants and catalysts are in same phase.

Ex, in Lead chamber process,



ii) Heterogeneous :- Reactants and catalysts are in different phases.

Ex In Ostwald's process,



Mechanism of Catalysis :- for heterogeneous reaction,

There are 3 theories :-

- a) Modern Adsorption theory,
- b) Adsorption Theory,
- c) Intermediate formation.

### 3) Colloids:-

It is a heterogeneous system in which one substance is dispersed as very fine particles in another substance called dispersion medium.

• ~~Def.~~ Its size is:  $1 \text{ nm} < \text{particle size} < 1000 \text{ nm}$

### \* Classification of colloids:-

- basis of physical state of phase and medium.
- Nature of interaction.
- Type of particles of dispersed phase.

<u>Phase</u>	<u>Medium</u>	<u>Type</u>	<u>Examples</u>
i) Solid	Solid	Solid sol	Gem stones
ii) Solid	Gas	Aero sol	Smoke
iii) Solid	Liquid	Sol	Paints
iv) Liquid	Solid	Gel	Cheese
v) Liquid	Liquid	Emulsion	Milk
vi) Liquid	Gas	Aerosol	Fog
vii) Gas	Solid	Solid sol	Pumice
viii) Gas	Liquid	Foam	Whipped cream