(2) Surface chemistry 4th sem (G)
19-05-20

Adsorption — Adsorption is a process where gaseous solid particles are adhered on the solid surface. The gaseous particles are known as adsorbate particles and the solid surface is known as adsorbend.

Two types of Adsorption —
- Physical Adsorption
- Chemical Adsorption.

Physical Adsorption :— When adsorbate particles are adhered on the adsorbend (surface) by means of Vander waals forces, the process is known as physical adsorption or physisorption.

Chemical Adsorption — When adsorbate gaseous particles are bonded chemically with the adsorbend (surface) the process is known is known as chemical Adsorption or chemisorption

Differences

physical adsorption	chemical adsorption.
1. Vander waals bonding is present	1. chemical bond is present.
2. Low enthalpy evolved ranging from 5–20 Kcal / mole	3. High enthalpy evolved, usually from @ 80 to 120 Kcalorie / mole.
3. High pressure favours	3. Low pressure favours.
4. Physical adsorption occurs in multi-layer	4. chemical adsorption occurs in monolayer.

Freundisch Adsorption Isotherm

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The process of Adsorption depends on Pressure and temperature. The adsorbate particles fall on the solid surface (adsorbent) follow some poinciples. Freundisch put-forwarded that the fraction of adsorption depends on pressure.

Let x is the particles already adsorped by the mass, m at the solid surface. so that

$\frac{x}{m} = K p^{1/n}$ Where $n \rightarrow$ no of Particles
$K \rightarrow$ constant.

Taking log on both sides

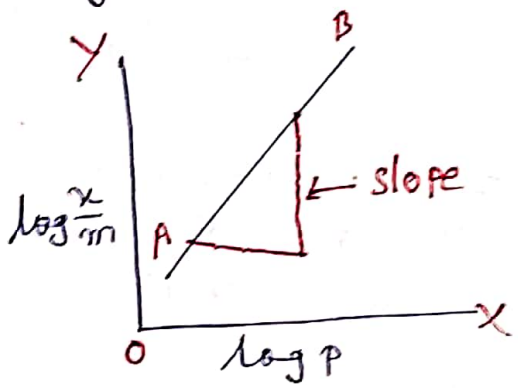
$$\ln \frac{x}{m} = \ln K + \frac{1}{n} \ln P$$

or

$$\boxed{\text{Log} \frac{x}{m} = \log K + \frac{1}{n} \log P}$$

If $\log \frac{x}{m}$ is plotted against P a straight line will be obtained

AB is a straight line



The $\boxed{\text{Slope} = \log \frac{x}{m}}$

Freundisch Adsorption isotherm is physical adsorption where bondings are formed due to Vander Waals forces. It occurs in multilayer and effective at high pressure