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Types of adsorption

Adsorption is of two types.

(i) Physical adsorption :- When gas is adsorbed on the solid (adsorbent) by vander waal's forces and not bonded by any other chemical bond, it is called physical adsorption or vander waal adsorption. This type of adsorption involves low heat of adsorption and generally reversible in nature. When Increase in temperature decreases the amount of adsorbate and decrese of temperature increases the amount of absorbate. Similarly increase in pressure increases amount of adsorbate and decrease in adsorbate decreases amount of aborbate on adsorbent.

(ii) Chemical adsorption or chemisorption. — when absorbate is adsorbed on adsorbent surface by formation of chemical bond, the process is called chemisorption.

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Here heat evolved is generally high same as formation of chemical bond in the chemical reaction. It is not reversible reaction and effort to free the adsorbed gas from surface of adsorbent is result in other definite compound. Example – O_2 adsorbed on the surface of charcoal liberated as CO or CO_2 and not as O_2.

Difference between physical adsorption and chemisorption.

Physical adsorption	Chemisorption
(i) Adsorbate is linked with adsorbent with vander wall forces.	(i) Adsorbate is bonded with adsorbent by chemical bond.
(ii) No compound formation on the surface of absorbent.	(ii) There is a compound formation at the surface of absorbent
(iii) As vander waal forces are weak hence low heat evolved - 20-40 KJ mol^{-1}	(iii) High heat is evolved in chemical adsorption. 40-400 KJ mol^{-1}

4. It is reversible reaction. De-sorption occurs with increase in temperature or decrease in pressure.	4. It is irreversible process. Efforts to ~~free~~ absorbate result in to give some definite other compound.
5. forms multi-molecular layers.	(5) It is unimolecular layer is formed.
6. It is not specific in nature. all gases are adsorbed on all solid ~~with~~ to same extent.	(6) It is specific in nature and occurs when there is same possibility to form chemical bond on the surface.
7. Adsorption decrease with increase in temperature	(7) Adsorption increase with increase in temperature.

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Adsorption Isotherm - The curve obtained between the amount of the gas adsorbed and equilibrium pressure at constant temperature is called adsorption isotherm.

Five different type of adsorption isotherms have been observed for adsorption of gas on solids. They are.