

CHEMISTRY STUDY MATERIALS FOR CLASS 12

GANESH KUMAR

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Surface Chemistry (Key Points)

Properties of colloids:

Optical properties: Tyndall effect: Due to scattering of light by colloidal particles by which the beam of light becomes visible.

Brownian movement: Zig-zag movement of colloidal particles due to collision between particles of DP & DM, responsible for stability of colloids.

Electrophoresis: Movement of colloidal particles under influence of electric field.

Electro-osmosis: molecules of dispersion medium allow dot move under influence of electric field.

Coagulation or flocculation: Process of settling of colloidal particles into precipitates or float on surface addition of electrolytes.

HardySchulzlaw: Coagulating power of an electrolyte increases rapidly with the increase in the valency of cation or anion.

For negatively charged sol, the coagulating powers of electrolytes are:



For positively charged, then the coagulating power of electrolytes follow the following order:



Emulsion: liquid-liquid colloidal system..e.g. milk, Na soaps, vanishing cream, etc

. Types of emulsions:

Oil in water: when oil is the dispersed phase and water is the dispersion medium, e.g. milk.

Water in oil: when water is the dispersed phase and oil is the dispersed medium, e.g. butter,

Applications of colloids:

- | | | |
|---------------------------|-----------------------------|------------------------|
| (a) Rubber plating | (b) Sewage disposal | (c) Smoke screen |
| (d) Purification of water | (e) Cleaning action of soap | (f) In medicine |
| (g) Photography | (h) Artificial rain | (i) Formation of delta |

FREQUENTLY ASKED QUESTIONS

Very short answer type questions (1 mark each)

Q1. What is the sign of ΔH and ΔS for adsorption of bromine on charcoal?

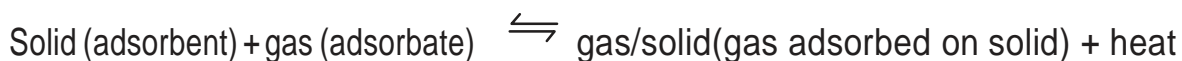
Ans. Both ΔH and ΔS are negative.

Q2. Why are substances like platinum and palladium often used for carrying out electrolysis of aqueous solutions?

A2. Platinum and palladium are inert materials & are not attacked by the ions of the electrolyte or the products of electrolysis therefore used as electrodes for carrying out the electrolysis.

Q3. Why does physisorption decreases with the increase of temperature?

A3. Physisorption is an exothermic process i.e, heat is produced in the process.



According to Le-Chatelier's principle, if we increase the temperature, equilibrium will shift in the backward direction, i.e, gas is released from the adsorbed surface.

Q4). Why is it necessary to remove CO when ammonia is obtained by Haber's process?

A4). CO acts as a poison for the catalyst in the manufacture of ammonia by Haber's process.

Q5) What is the physical states of dispersed phase and dispersion medium of froth?

A5. Dispersed phase is gas, dispersion medium is liquid.

Q 6. What is shape selective catalysis?

A 6. It is the catalytic reaction that depends upon the pore structure of the catalyst and size of the reactant and product molecules.

Q7. Why lyophilic colloids are more stable than lyophobic colloids?

A 7. Due to (i) solvation (ii) charge on the colloidal particles.

Q8) What is the cause of Brownian movement among colloidal particles?

A8 Due to unequal collision between particles of dispersed phase and dispersion medium.

Q9) Write the main reason for the stability of colloidal sols.

A9. Brownian movement/charge on colloidal particles.

Q10) Give an example of micelle system?

A10. Sodium stearate ($C_{17}H_{35}COO^-Na^+$).

Q11) Write down the example of positively charged sol?

A11. Ferric hydroxide sol.
