

Note :

1. The sky looks blue due to scattering of sunlight by the colloidal particles of dust along with water in the atmosphere.
2. Charged water droplets in the form of mist or fog suspend in the atmosphere and thus mist or fog is colloidal in nature. Therefore, when two oppositely charged clouds meet, mutual coagulation occurs and this results in rain.
3. Artificial rain can be caused by spraying oppositely charged sol or electrified sand on the cloud from an aeroplane.
4. Many of the foodstuffs like milk, *halwa*, ice-cream, fruit juice etc. are in colloidal form.
5. Blood is a colloidal solution of an albuminoid substance. The styptic action of alum and FeCl_3 is due to coagulation of blood that makes a clot and thus stops bleeding.
6. Soil is a colloid where humus is the protective colloid. Soil can adsorb moisture and nourishing materials due to its colloidal nature.
7. The charged colloidal particles of clay, mud and sand get coagulated when river water comes in contact with salty sea water. This results in deposition of these particles which leads to formation of delta.

Applications of Colloids:

1. **Precipitation of Smoke:** In Cottrell Precipitator, smoke (colloid), before it comes out of chimney, is allowed to pass through a chamber containing plates having charge that is opposite to that of the smoke particles. The charged smoke particles get discharged and thus settle down due to coagulation.
2. **Purification of Drinking Water:** Suspended impurities and dirt present in water are coagulated by adding alum (an electrolyte).
3. **In Medicines:** Many of the medicines are prepared in colloidal forms. Because in colloidal form, they are more easily assimilated. e.g. Colloidal gold (for intramuscular injection), milk of magnesia (for stomach disorder), colloidal antimony (for curing kalaazar), argyrol (a colloid of silver used as eye lotion) etc.
4. **Cleansing Action of Soaps and Detergents :** Cleansing action of soap is due to the formation of associated colloid of micelle particles.
5. **Rubber Industry:** Latex is a colloid (-vely charged) from which rubber is obtained by coagulation.
6. **In Metallurgy:** Sulphide ore is concentrated by emulsifying with pine oil.
7. **Industrial Products:** Paints, inks, plastics, rubber, graphite lubricants, cement etc. are all in colloidal forms.
8. **Photography:** Photographic films are prepared by coating an emulsion of AgBr in gelatine over celluloid film.
9. **Tanning:** Colloidal animal hides (having positively charged particles), when soaked in tannin or chromium salts, mutual coagulation occurs that results in hardening of the leather.

► **What are the factors that are responsible for the stability of lyophilic colloids?**

Ans: (i) The charge of the colloidal particles and (ii) the greater extent of solvation of the particles.

► **What do you mean by protection of colloids?**

Ans: When a lyophilic colloid is added to a lyophobic colloid, the lyophilic particles form a layer around the lyophobic particles and thus protect the latter from coagulation caused by electrolytes. This phenomenon of protecting lyophobic colloids by lyophilic colloids from getting coagulated due to presence of electrolytes is called protection.

► **What are enzyme inhibitors? How do they work?**

Ans: Certain substances, when present in the reaction, decrease the efficiency of the enzymes. Such substances are called enzyme inhibitors or poisons.

The action of the inhibitors is due to their preferential interaction with the active sites (functional groups) of the enzymes and thereby reduce or even completely destroy catalytic activity of the enzymes.

► **Why is ester hydrolysis slow in the beginning and becomes faster after sometime?**

In ester hydrolysis, the carboxylic acid produced in the reaction works as the catalyst (autocatalysis) which increases the rate of the reaction after sometime.

► **In Haber's process, hydrogen is obtained by reacting methane with steam in presence of NiO as catalyst (Steam reforming). Why is it necessary to remove CO when NH_3 is obtained by this process?**

In this reaction, CO acts as the poison for the Iron catalyst used in the Haber's process.

► **What is the role of desorption in the process of catalysis?**

In heterogeneous catalysis, the products formed on the surface of the catalyst must be desorbed so as to make room for other reactant molecules to be adsorbed and thus to facilitate further reaction.