

Colloidal electrolytes

Colloidal electrolytes are solutions of salts in which one ion has been replaced by a heavily hydrated, polyvalent micelle, carrying an equivalent sum total of electrical charges and also serving as an excellent conductor of electricity. Alternatively colloidal electrolytes are those electrolytes that are partially associated and that form conducting when dissolved in water. Dyes, various indicators, gelatin, salts, soaps, detergents, etc. are the examples of colloidal electrolytes. In general, substances with high molecular weights and containing long carbon chains, which are capable of producing one ordinary ion, are colloidal electrolytes.

Classification of Surface active agents or colloidal electrolytes.

The colloidal electrolytes are divided into three classes.

(1.) Colloidal electrolyte with active anion.

examples are, soaps ($\text{RCOO}^- \text{Na}^+$), synthetic detergents, etc.

(2.) Colloidal electrolytes with active cations.

examples are; salts with high molecular weights, such as alkyl ammonium salts, pyridinium halides.

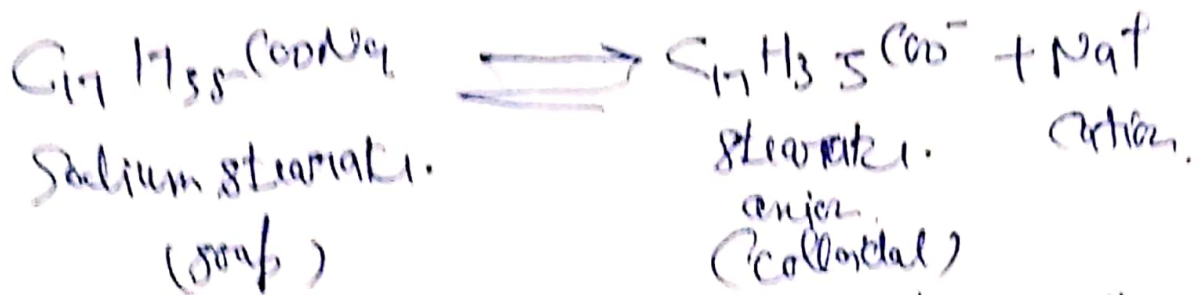
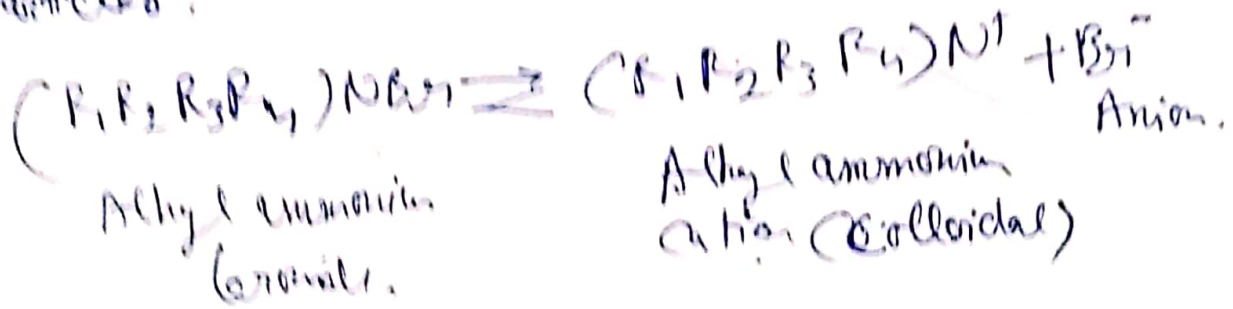
(3) Colloidal electrolytes with both cations and anions active.

Examples such colloidal electrolytes are insoluble.

Properties: The colloidal electrolytes all the phenomena of sols.

(i) They have main properties of electrolytes and colloidal particles, such as typical colloidal electrolytes, e.g., alkali salts of higher fatty acids, formylates, and fatty ammonium ions of large size.

The ions being of large size, behave as colloidal particles.



(ii) Colloidal electrolytes give colloidal solutions with large electrical conductance.

(iii) Colloidal electrolytes cannot be regarded as macromolecules as they are individual molecules of giant size in solution.

(iv) Solutions of colloidal electrolytes have lower osmotic pressure than expected. It is due to the fact that number of particles decreases as a result of aggregation of several ions to form a single micelle. The charge of the micelle

∴ the sum of electrical charges, hence their electrical conductivity remains high. (5)

(V) Colloidal electrolytes differ from water-holding colloids, because latter are unstable whereas former are stable.

(VI) Soap solution behaves like normal electrolyte and surface tension decreases continuously, from that of pure water.

(VII) Micellization is an important property of association colloids.

Importance of Colloidal Electrolytes! Many colloidal

Electrolytes function as excellent detergent and emulsifying agents. The detergent action depends on their ability to reduce water repellent dirt or dye particles into the micelle. Clusters of water-insoluble dyes are solubilized in soap solution and subsequently deposited uniformly on fabrics.
