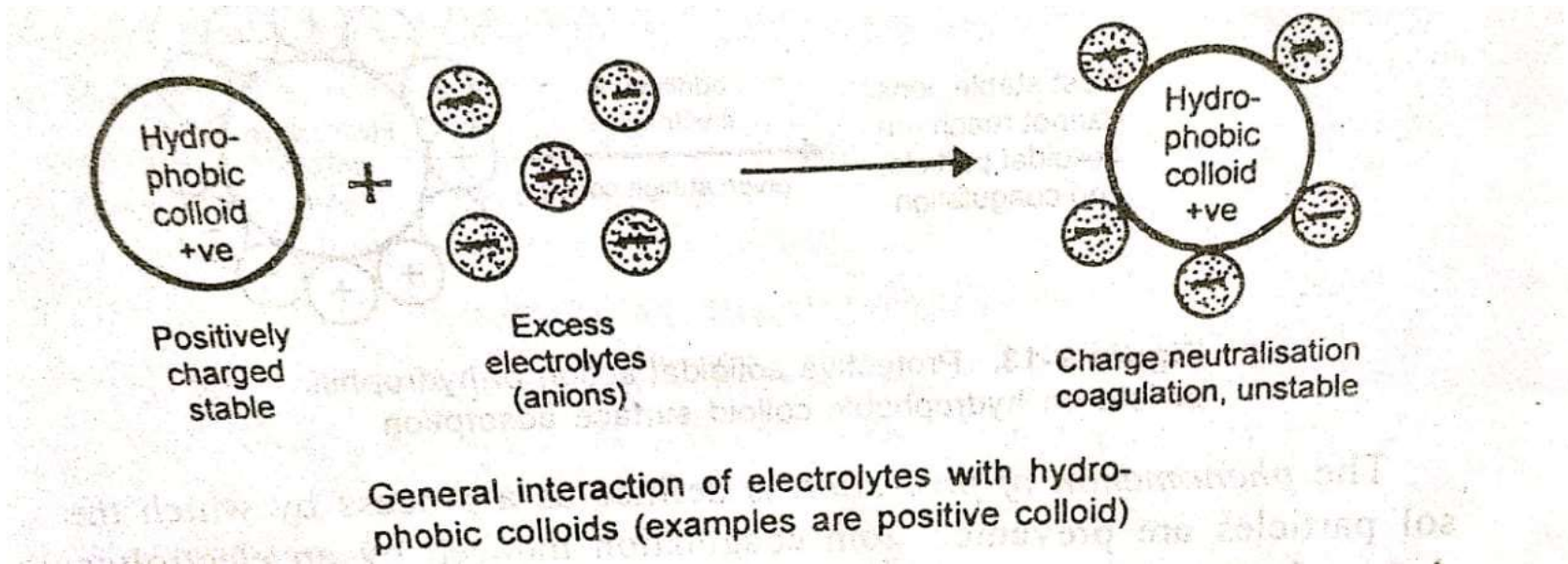


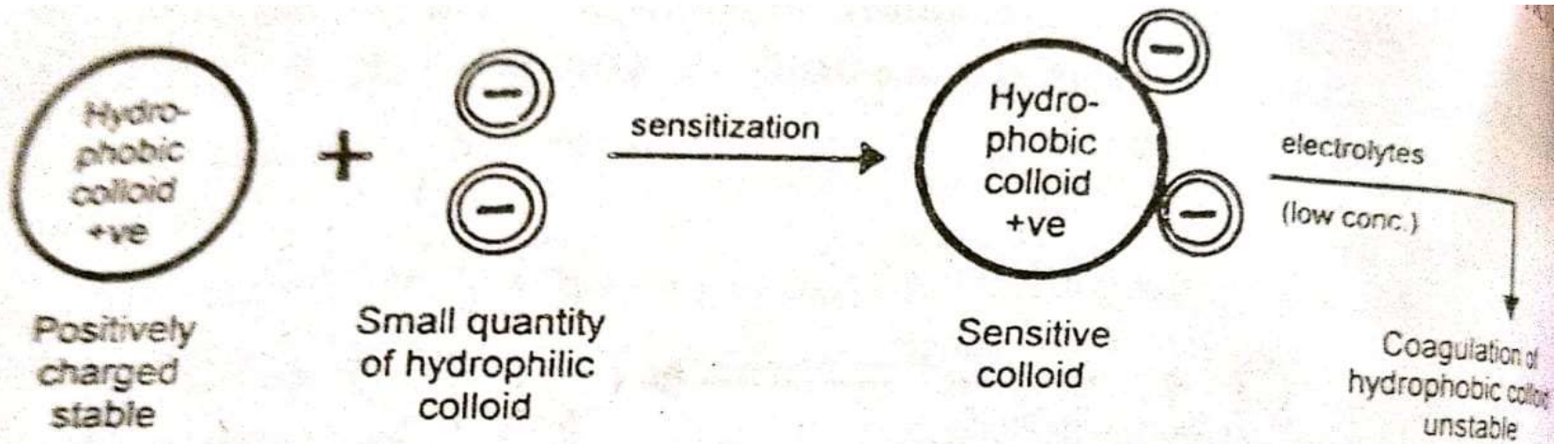
# Sensitization and Protective colloidal action

- Lyophobic dispersions are unstable in the presence of even small concentration of electrolytes. Effect is due to neutralisation of the charge on the particles.



# Sensitization

- If a very small amount of hydrophillic colloid is added to a hydrophobic sol, it is sometimes observed that the latter has become more sensitive to precipitation on the subsequent addition of electrolytes.
- The sensitization may be partly due to adsorption of the oppositely charged hydrophillic sols on hydrophobic particles.



Sensitization of hydrophobic colloid (examples of positive colloid)

# Protective colloidal action

- When a large amount of hydrophilic colloids carrying opposite charges is added to hydrophobic colloids, these get adsorbed on the hydrophobic particles and form a protective layer around it.
- This adsorption layer prevents the precipitating ions reaching the sol particles and hence preventing the coagulation.
- An entire colloids are thermodynamically stable and behaves like hydrophilic colloid.

- The colloid that helps to stabilize other colloids is called as a protective colloid.

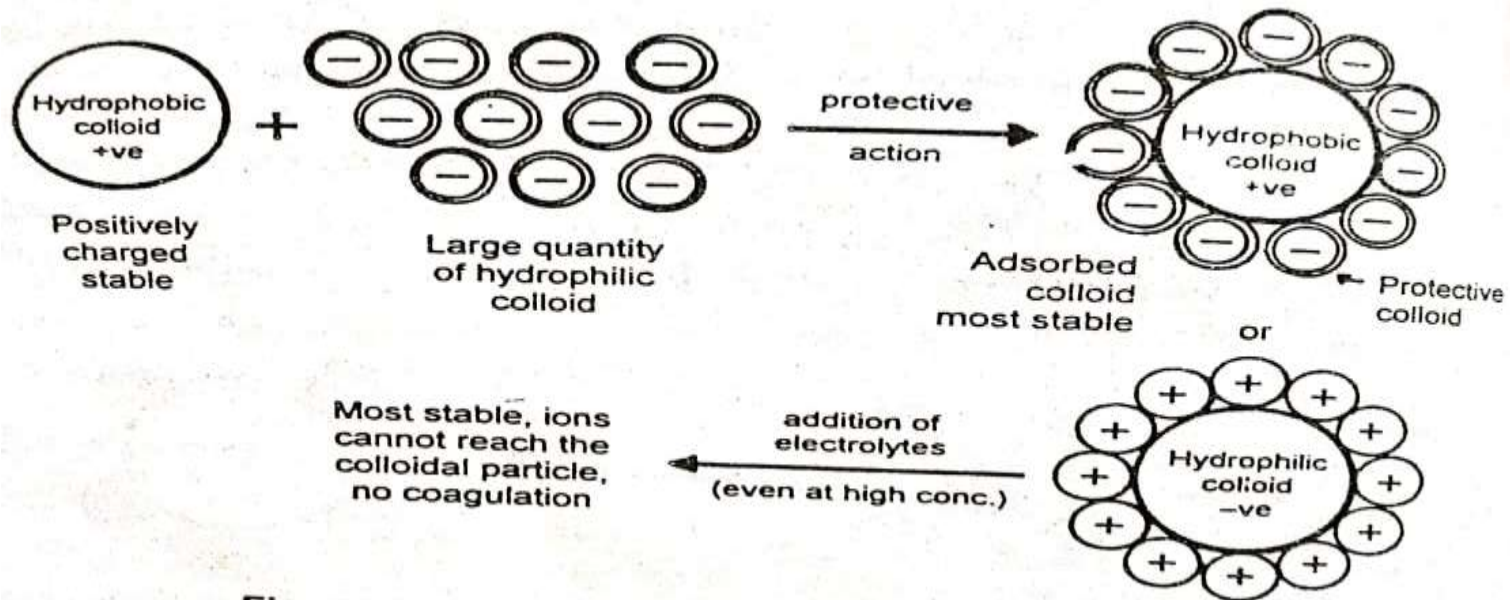


Figure 9-13. Protective colloidal action of hydrophilic colloid on hydrophobic colloid surface adsorption.

- The phenomenon of protection is defined, as a process by which the sol particles are prevented from coagulation induced by an electrolyte due to the previous addition of a some lyophilic sol.
- Eg.: hydrophobic sols for injection such as colloidal gold ( $^{198}\text{Au}$ ) injection, must be sterically stabilized, in this case by gelatin.
- The protective property of colloids is expressed in terms of **gold number**.

# Gold number

- ❖ The gold number is defined as the minimum weight in milligrams of a protective colloid ( dry wt of dispersed phase) required to prevent a color change from red to violet in 10ml of gold sol on addition of 1ml of 10% solution of sodium chloride.
- ❖ Lower the gold number, greater the protective action.
- ❖ Eg.: bismuth subcarbonate does not dissociate sufficiently in a dispersion.
- ❖ Now, if tragacanth is added, it provides a protective action.
- ❖ If bismuth subcarbonate is ionized then tragacanth( negative charge) reacts with positive ions of bismuth and forms a gel.

Protective colloid	Gold number
Gelatin	0.005-0.01
Albumin	0.1
Acacia	1-5
Tragacanth	2



# References

- C.V.S. Subrahmanyam, Textbook of physical pharmaceuticals, second edition, published by vallabh prakashan , page no.341-343

Thank you