



Environmental Chemistry

Part 3 Hydrospheric Chemistry

3.5 Dispersions



Thermodynamic Classification

- *Lyophilic colloids*
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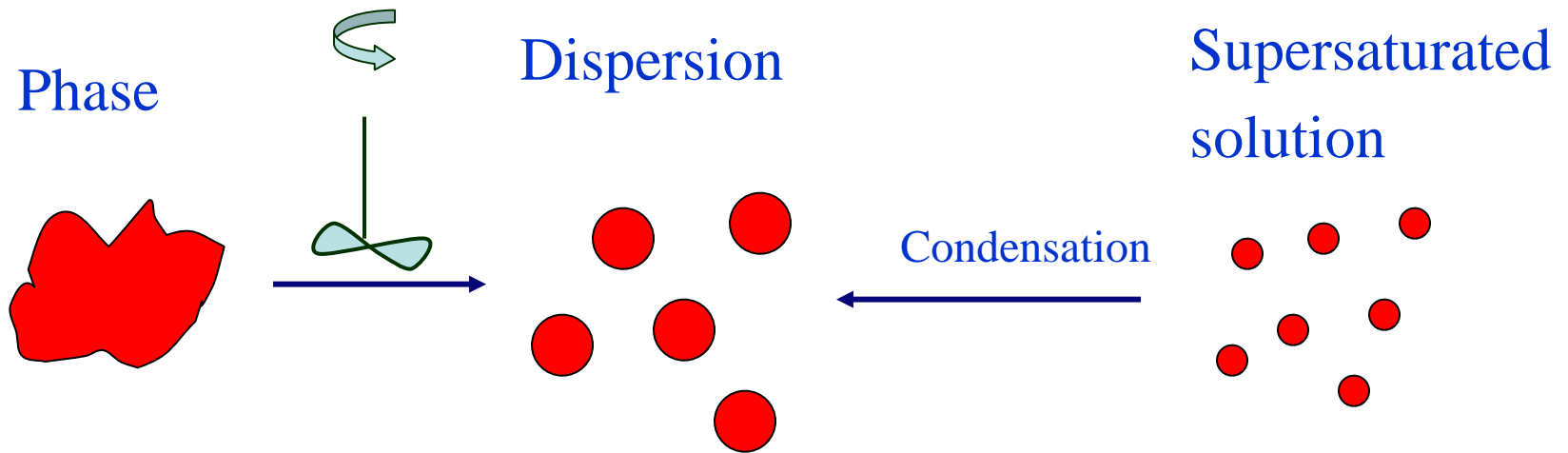


Lyophobic Colloidal Systems

- Dispersions that are **thermodynamically unstable** and exist only during certain period of time (“*kinetic stability*”)



Formation of Lyophobic Colloids



Property: excessive surface energy (aggregate)

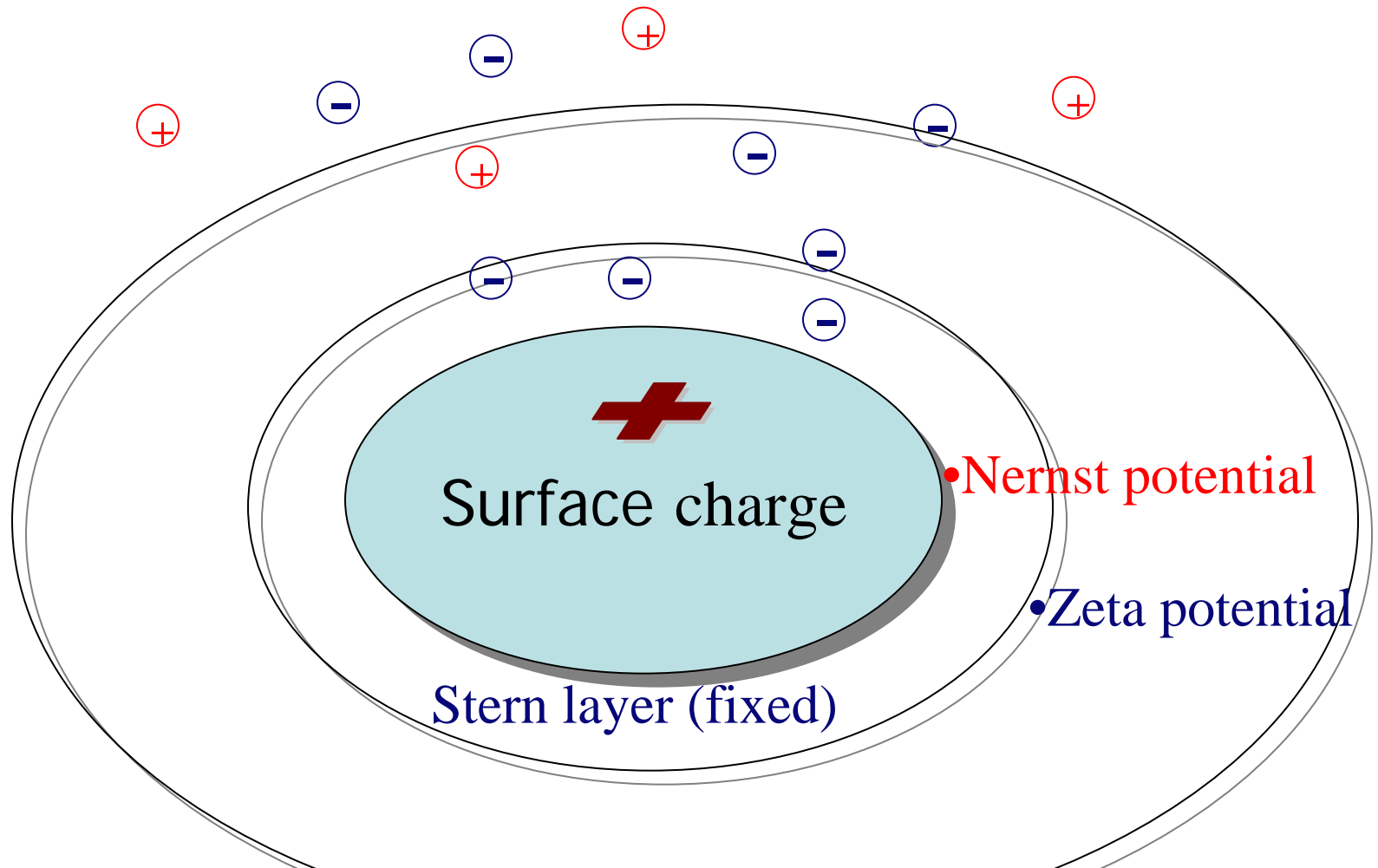


Examples of Lyophobic Colloids

- **Emulsions** (liquid in liquid)
- **Suspensions** (solid in liquid)
- Foams and films (gas in liquid)
- Aerosols
 - Mists (liquid in gas)
 - Smokes (very disperse solid in gas)
 - Dusts and Powders (rough solid in gas)
 - London smog (solid particles covered by condensed vapor in gas)

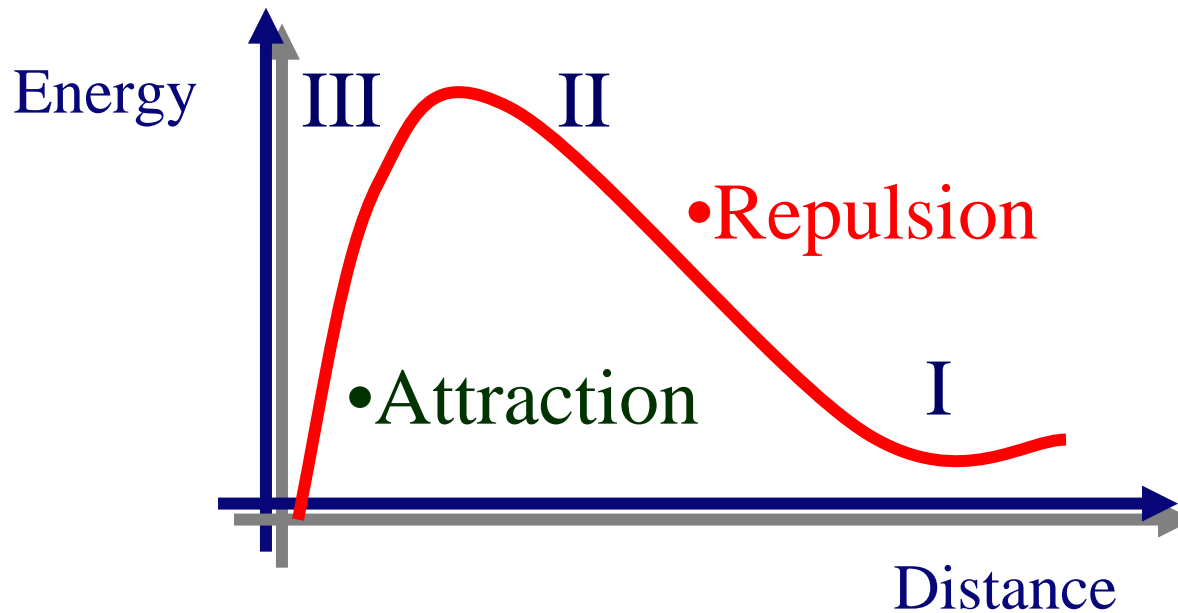
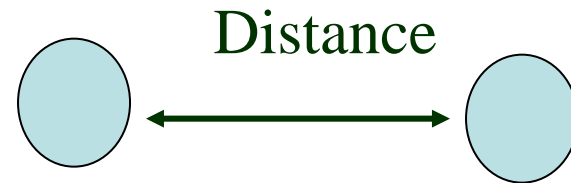
Electrical Double Layer

Electroneutral solution



DLVO Theory

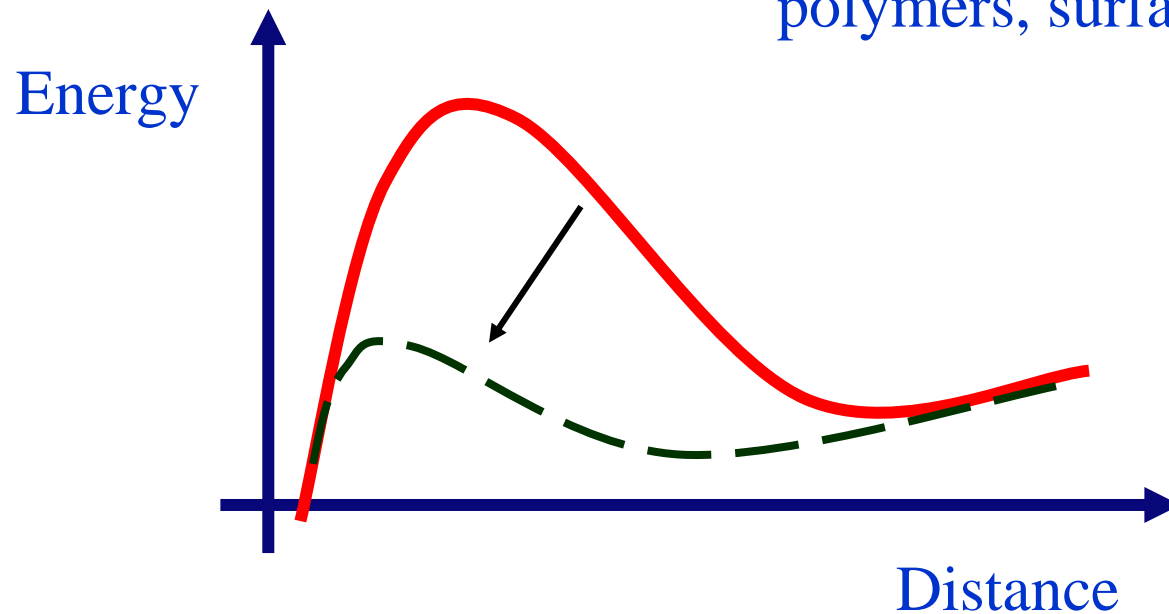
- van der Waal's attraction
- Electrostatic repulsion



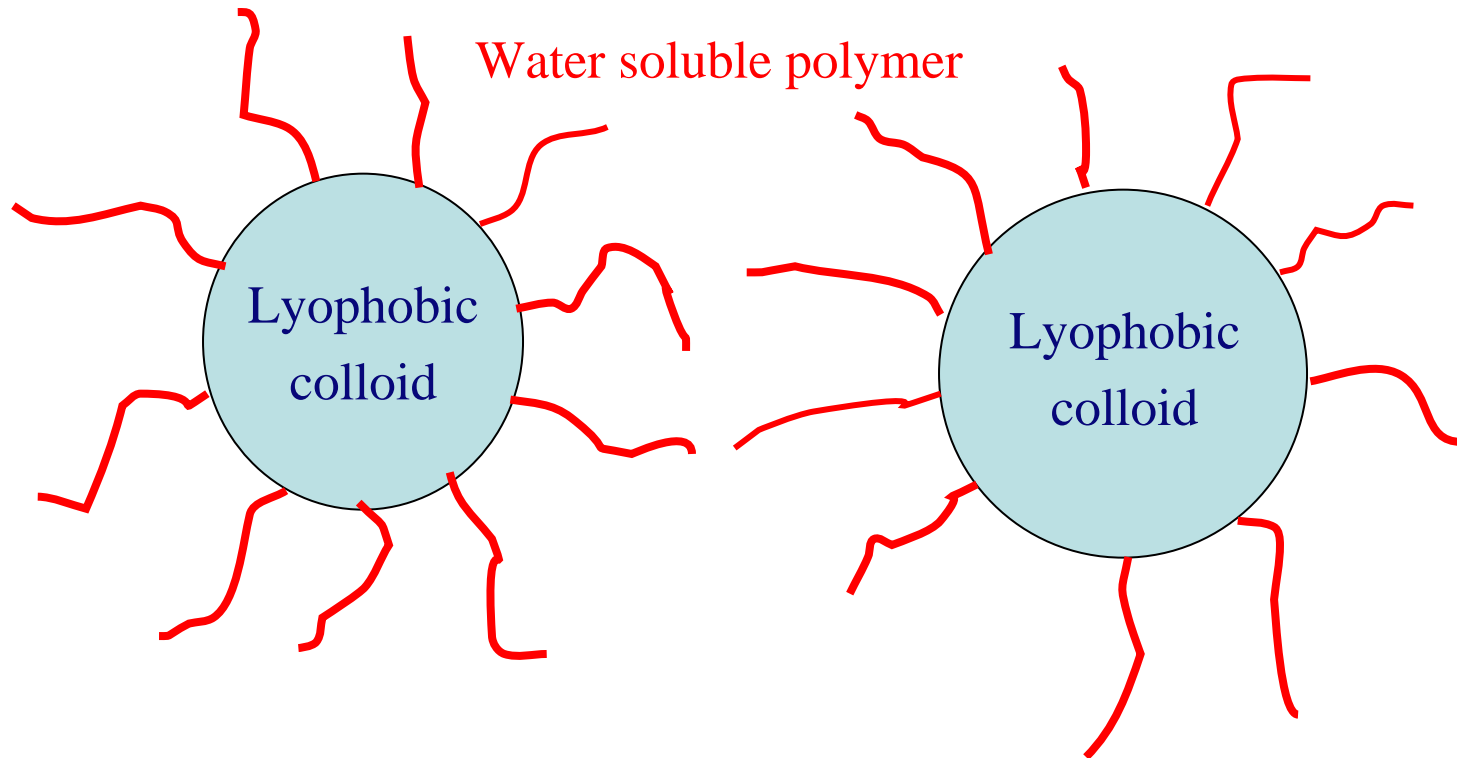


Effect on stability

- Electrolytes in solution
- Adsorption of counterions
polymers, surfactants



Structure-Mechanical Barrier



“Stealth” Liposomes