

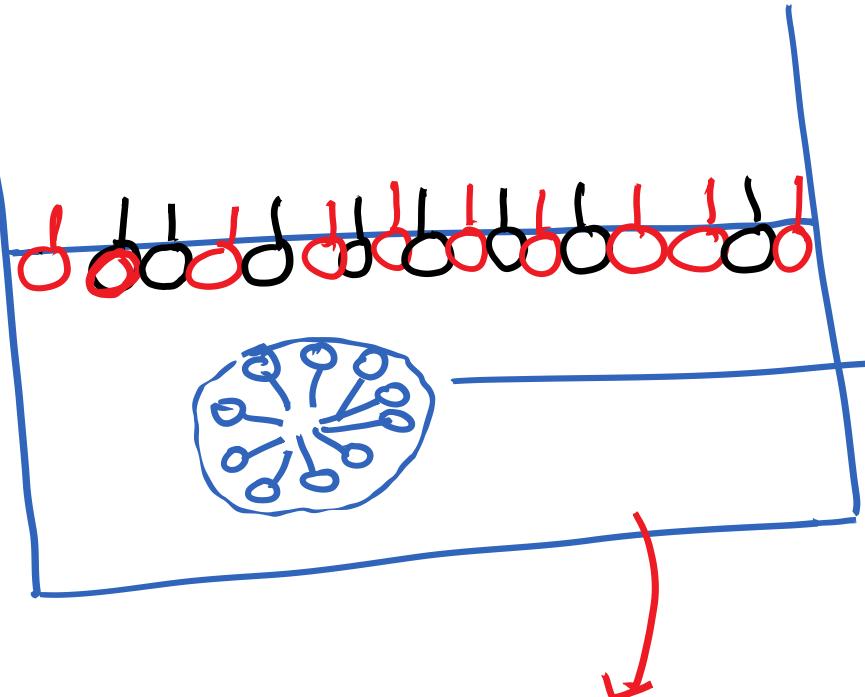
Date: 09. 02. 2022

Lecture 13

Add more number of Surfaceat molecules



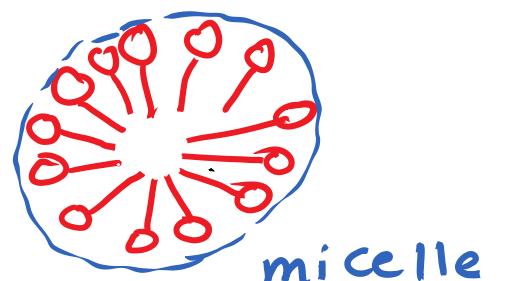
And the Concentration of Surfaceat for which micelle form
is CNC.



Critical Micelle Concentration

Self assembled structure

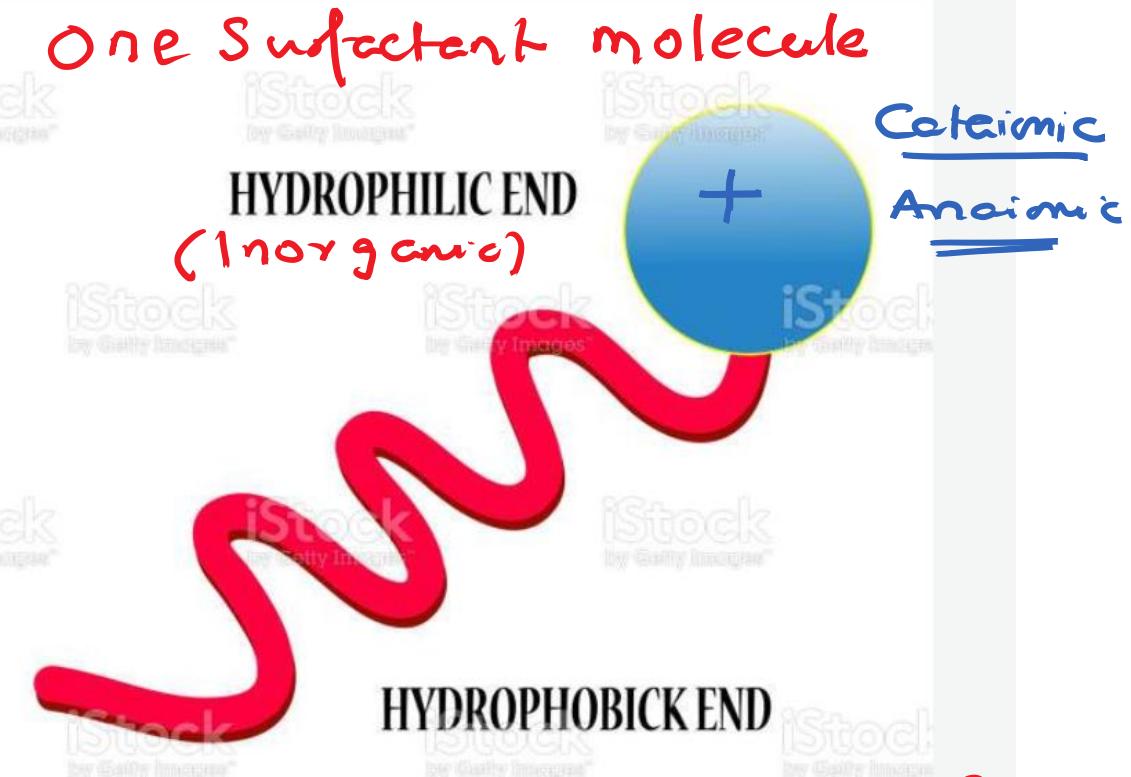
→ The tails remain embedded/ hidden



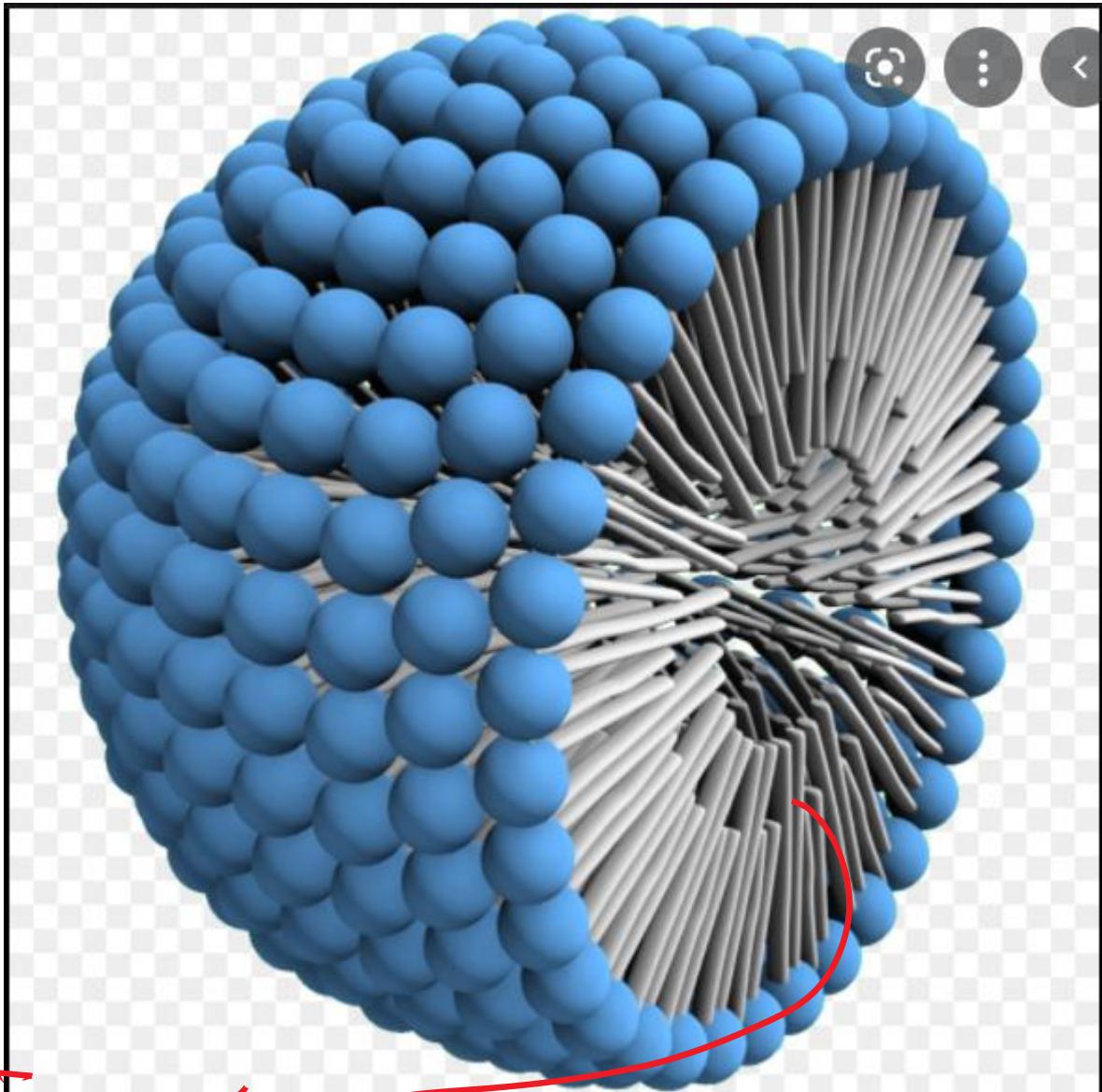
Tails are hidden inside and outer surface is only the head group.

Water now sees/ comes in contact with only the head groups = Micelle as a whole is thermodynamic favored.

Hydrophilic Surface, γ_S is more
Hydrophobic material, γ_S is less.



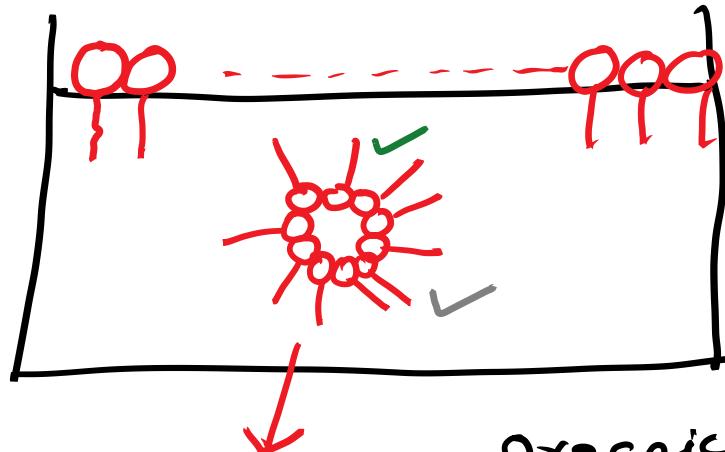
Section of a micelle



Central Part is
full with the entangled tails.

Instead of Water, if we add the Surfactant in a non-aqueous, organic medium.

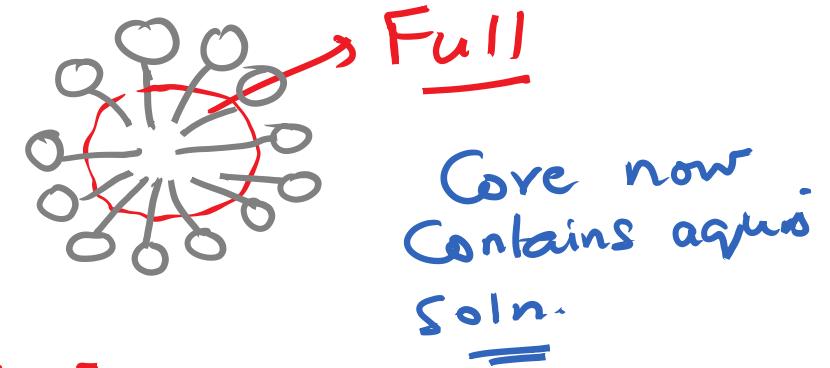
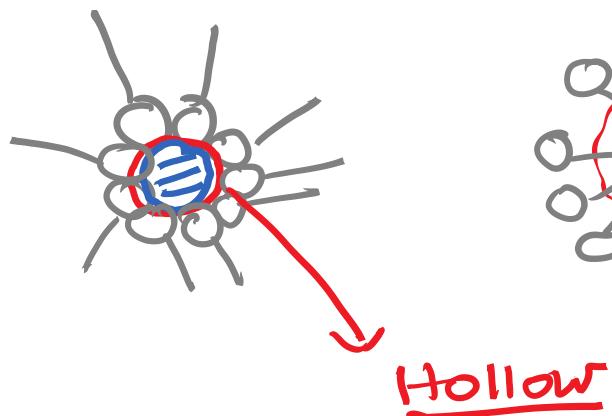
Inner Core of a Reverse micelle becomes a new reactor.



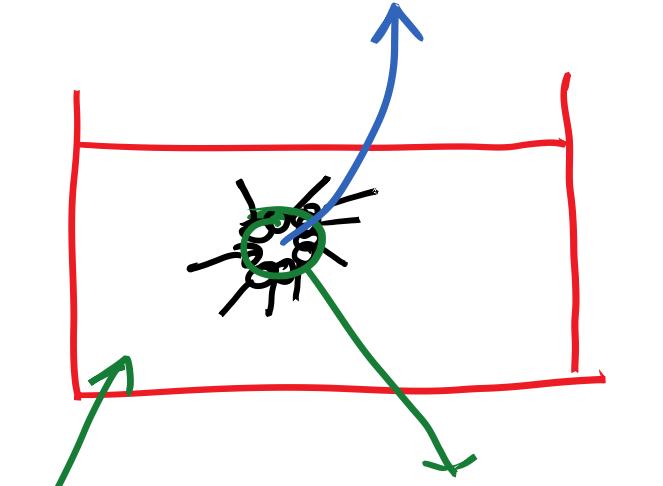
Tail has favored interaction with the Solvent.

(Reverse Micelle) \rightarrow Nanotechnology.

Synthesis technique for mono dispersed nano particles \rightarrow Size are same.

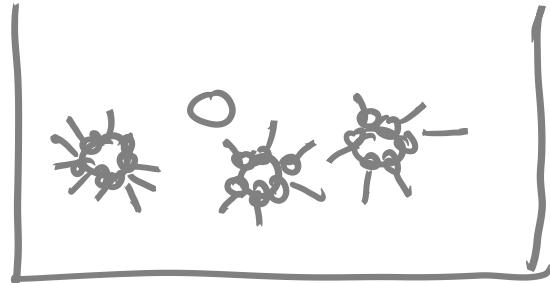


Core now contains aquo.
soln.

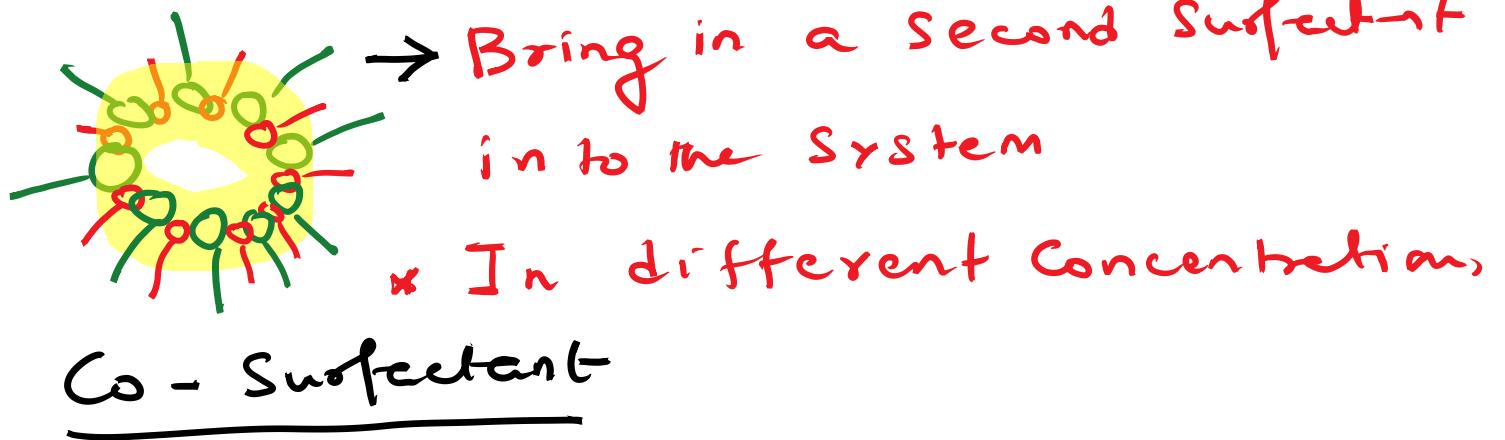


Org Solvent Dispersed Water

Given Surfactant + Solvent System \rightarrow Size of the
Reverse Micelles \rightarrow Same

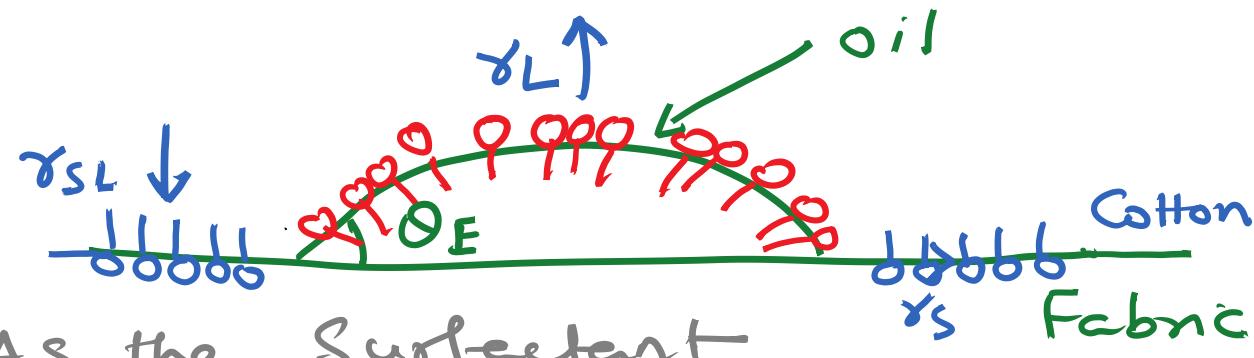


Can the size be modulated?
 \rightarrow Can you change/ control the size?



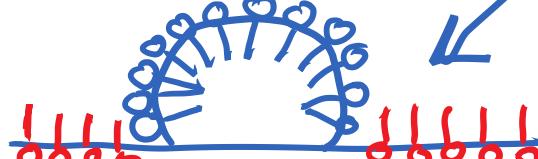
How does a detergent Clean?

Water + Surfactant



As the Surfactant molecules get adsorbed on the liquid, what is the Effective γ_L of this Surfactant Covered "Dirt" drop?

Cotton \downarrow



What is **dirt**? Very Western concept.

Tail is hydrophobic
oil is hydrophobic

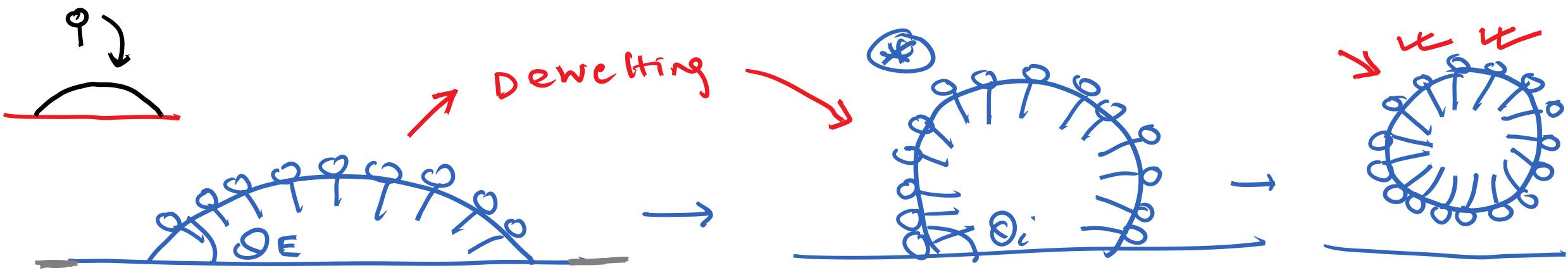
$$\gamma_S = \gamma_{SL} + \gamma_L \cos \theta_E$$

Outer Surface is the Head groups

Effectively the Surface Tension of the Liquid (Dirt) increases!

θ_E increases

In INDIA \rightarrow Particulate matters play horol. **DUST**
Particulate Detergency.



$\ominus_i \rightarrow$ Increases, as γ_L (aperent) increases

Detaches on its own.

Forcibly remove by rubbing.

↳ Generally, wash the cloth in Clean Water.

In case the Heeds do not have affinity to the Fabric.

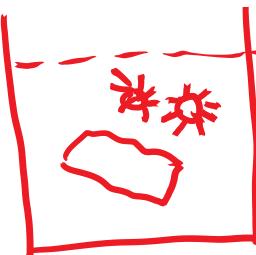
NOT Favored

Increase in OE is LESS

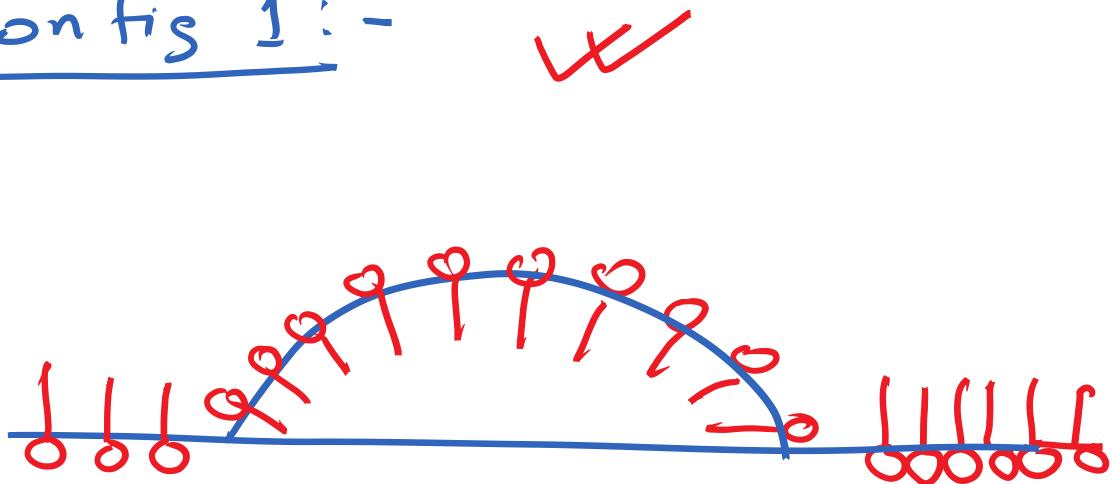
→ Hand Wash
Sanitizer

→ Dry Cleaning → ?? Organic Solvents.

→ What type of dresses are sent for dry cleaning.



Config 1:-



✓

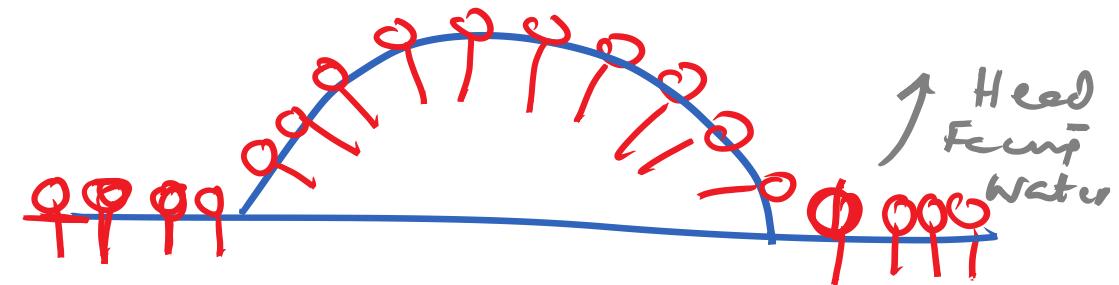
When does this happen?

When the head of has preferential affinity towards the fabric →

When the fabric is extremely hydrophilic → COTTON.

$\gamma_L \uparrow, \gamma_S \downarrow, \theta$ increases.

Config 2



Water

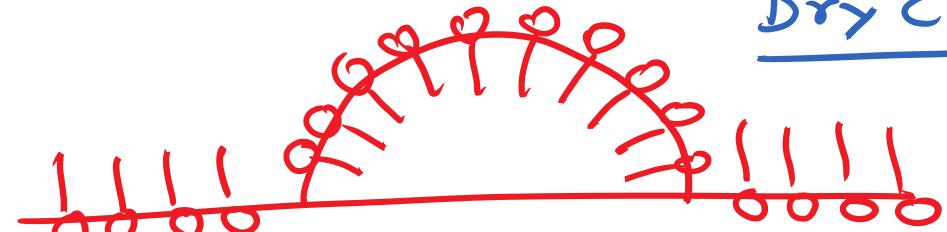
↑ Head
Feeling Water

$\gamma_L \uparrow, \gamma_S \uparrow$

The increase in θ will be less.

use organic medium for cleaning (instead of water).

Dry Cleaning

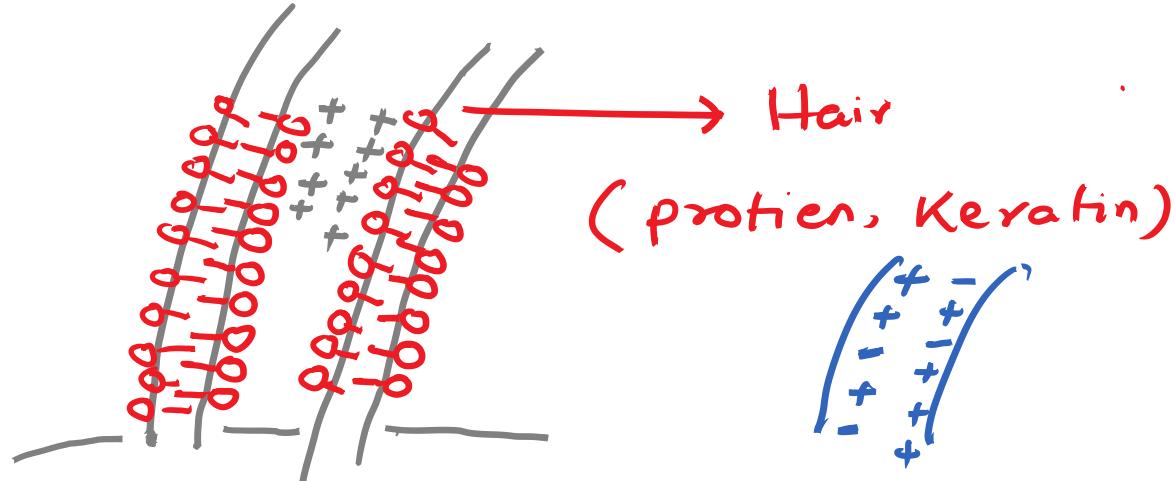


$\gamma_S \downarrow, \gamma_L \uparrow, \theta \uparrow$

Shampoo in your hair → Hair looks fluffy

Shampoo Cleans Hair → If you don't do Shampoo for Long → Hair becomes sticky and oily.

Why does hair become oily?



Sebum → Secreted from Roots of the hair.
↳ oil like.

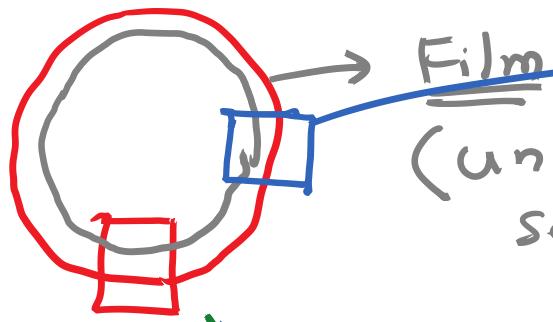
In case you see that post shampoo hair is not that fluffy → ??
(Non ionic Surfactant).

Conditioner - (oil base)

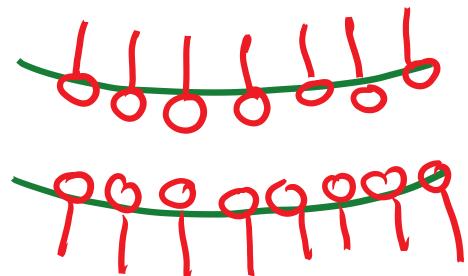
Main Shampoo has Cationic Surfactant,

Conditioner → will have An anionic Surfactant.

Soap Bubble → Why no bubble forms without soap.

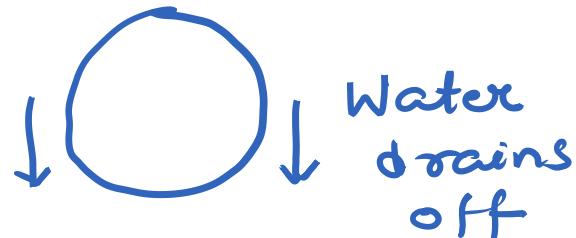


Film
(unsupported),
self supporting
Film

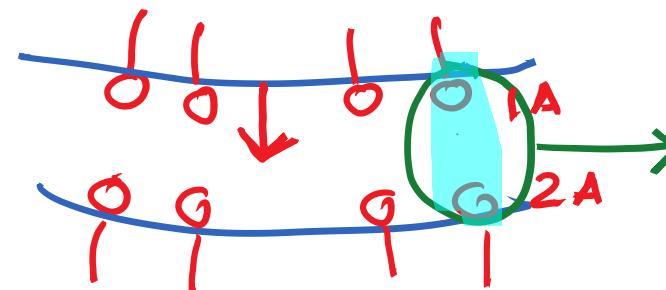


Non ionic
Surfactants are
not great for
soap bubbles.

A Soap bubble will NOT remain stable. →



Water
drains
off



The head groups come
closer to each other.

