molecules is highly hydrophillic and, hence an appreciable conc of the micelle is filled with the solubilised monomer. Initiator is found at this place.

Polymerisation, therefore, starts at the surface layer of micelle and proceeds inwards. At the micelle however, we have a very favourable condition for the polymerisation to occur.

At the end of polymerisation, we have fine particles of the polymer. This milky white dispersion is often called 'latex'

Use: The latex can either be used as such for making adhesives, water-soluble emulsion paints.

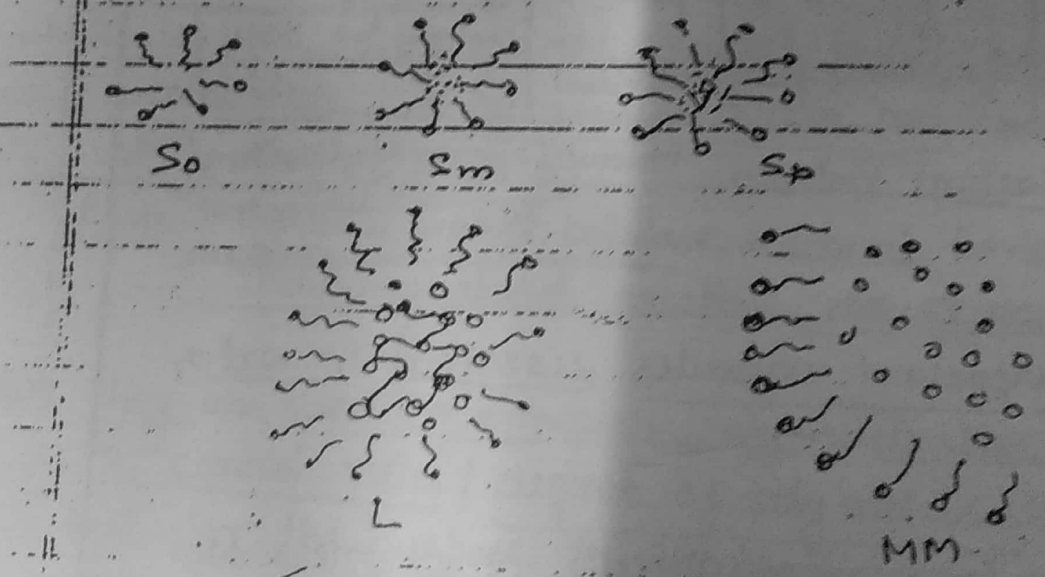

fig: So = the empty micelle
Sm = Monomers filled micelle
Sp = Micelle with growing polymer chain
MM = Monomer droplets
L = latex particle containing monomer as well as growing polymers.

(vii) Catalyst :- Used to accelerate the polymerisation.

(viii) Regulator ⇒ It is added to have a disactive effect on the reaction and perticularly tend to decrease the amount of cross linking or side chain reactions.

Exa: Dodecyl mercaptane

(ix) Buffer :- The pH of the emulsion must be mention for proper stability Exa: phosphate Carbonates, acetates are used for this purpose.

(x) Short stops ⇒ A selected inhibitor known as short stop may be added in small amount into the system in order to stop the reaction

Advantages :-

1. Rapid polymerisation to high mol. wt
2. The homogeneity of the polymer
3. Narrow distribution curve of m.wt.
4. Good heat control
5. Direct usable
6. Viscosity build up of the polymerisation mass is quite low
7. high mol. wt product is achieved by this techniques.

Disadvantages :-

1. Isolation- The polymer can be isolated from the latex by destabilizing the emulsion (using some electrolyte) by spray drying or by freezing.

(3) Leads to poor colours
(4) Washing, drying & combing may be required

USES:
* This tech is extensively for the free radical polymerisation of vinyl monomers containing water soluble initiator
* The monomers like vinyl chloride, butadiene, chloroprene, vinyl acetate, acrylates and methacrylates are polymerised by this tech.

क्रीम मार्क

The conc of the surfactant at which the phenomenon of micellization occurs is called CMC (critical micellar concentration)

Surfactant types

Cationic, Anionic, Nonionic, zwetterion

Suspension	Emulsion
① It have monomers droplets	① It have micelle in which the monomer is solubilized
② The quantity of emulsifier added is less than CMC	② The quantity of emulsifier added is to equal or more than CMC

Bulk polymerisation	Soln polymerisation
① Monomer is polymerized in its own medium only	① Monomer dissolved in a solvent
② Monomer soluble in catalyst is used	Catalyst soluble in monomer water mixture
③ Heat transfer is difficult	Heat transfer is done by solvent
④ No separation and drying of the polymer (for solid)	separation & drying (for some) is tough process (can be used as such)
⑤ Polymer very pure	Polymer contains solvent molecule
⑥ Rate of Polymerisation (R.P) & Degree of polymerisation (DP) is high	D.P is depend on solvent D.P is limited
⑦ Equipments are simple	equipment complex
⑧ Conversion cost high	Conversion cost highest

Emulsion polymerization	Suspension polymerization
Monomer is in emulsified form agitation weaker than suspension.	Monomer is suspended in water stabilizer very rapid agitation
water soluble catalyst is used	Monomer soluble catalyst is useds
Heat transfer is rapid and Emulsion act as a medium	Heat transfer is rapid and takes place to water
Coagulation after processing is costly	Separation & drying process are simple
Purity of polymer is poorest than suspension	Polymer is pure but has lower stability and clearity than in bulk method.
R.P is fastest D.P is also very high	R.P is high. D.P is high.
Rate of polymerization (R.P.) Degree of polymerization (D.P.)	
Simplest	Simplest
Conversion cost lowest	conversion cost higher than emulsion and lower than bulk.