Determination of Critical Micelle Concentration by Dye Titration

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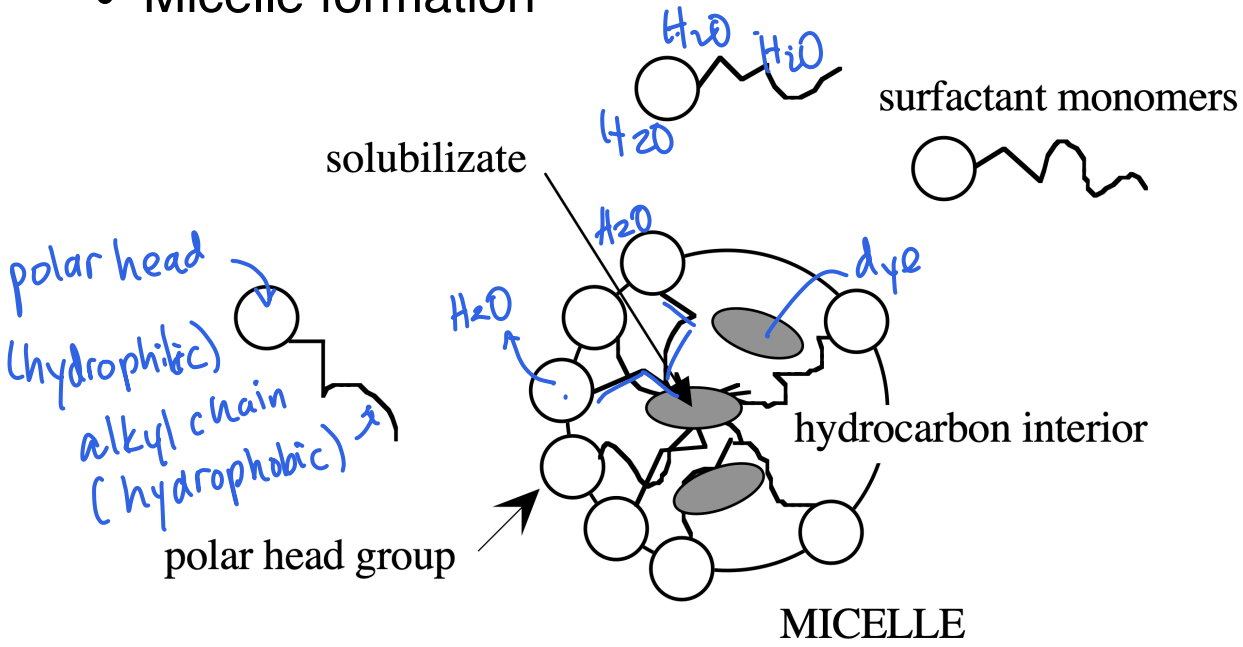
Micelle formation changes physical properties

- Micelle formation



$\Delta G = \Delta H - T\Delta S$

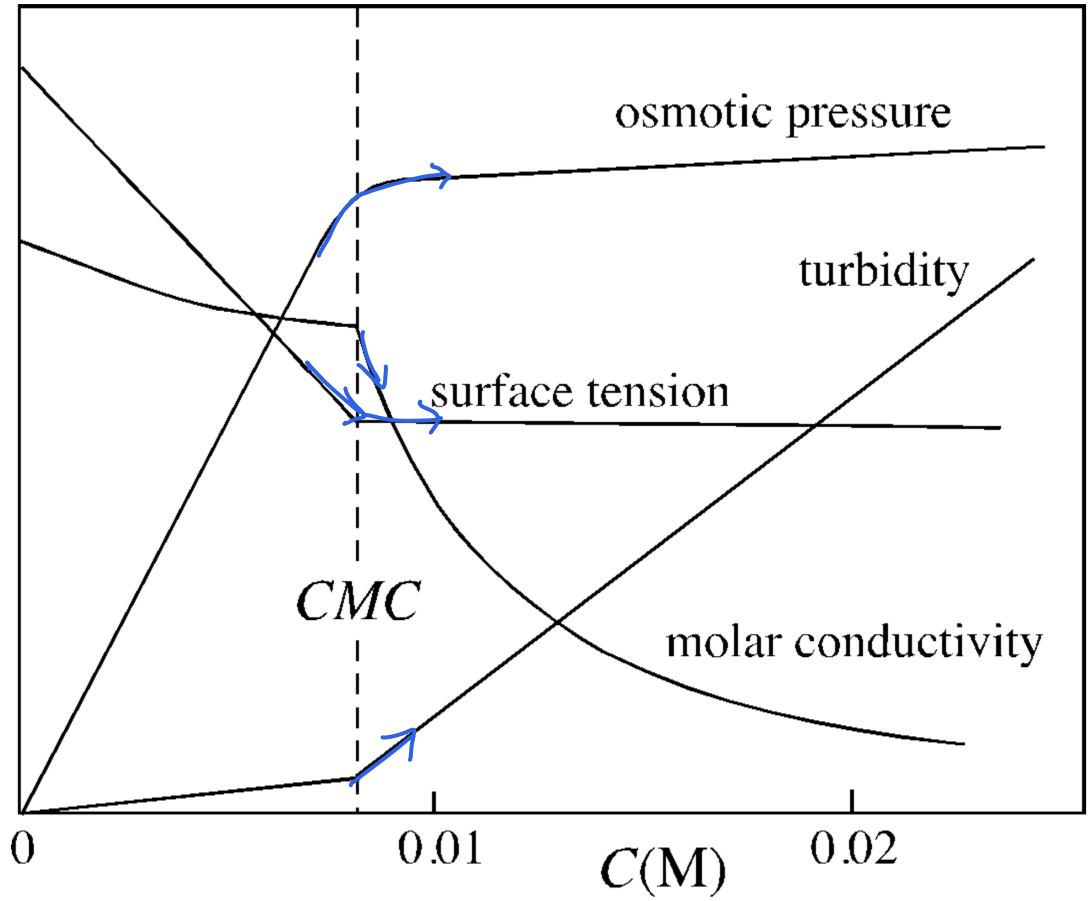
< 0

$\Rightarrow$ spontaneous

$\Delta S_{sys} > 0$

- $\Delta S_{surf} < 0$
- $\Delta S_{H_2O} > 0$

- Physical property of SDS at 25 °C



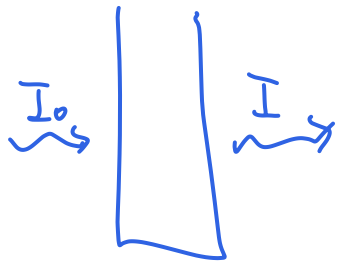
- CMC = critical micelle concentration

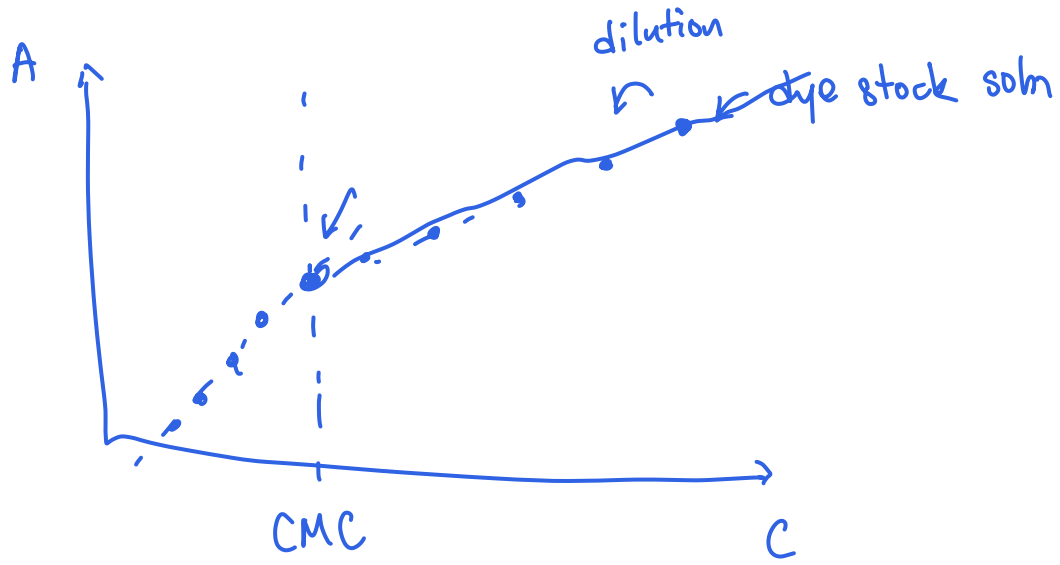
Absorbance of pinacyanol chloride dye changes at CMC

- Absorbance at $\lambda = 615\ \text{nm}$ (purple)

$$A = -\log T \propto C$$

transmittance $T = \frac{I}{I_0}$

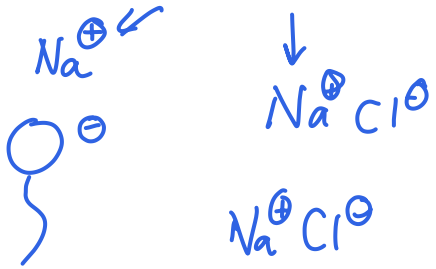




CMC decreases with positive counterion concentration

- CMC dependence on counterion molality

$$\log \mathrm{CMC} = -a \log m^{+} - b$$



counterion concentration of the soln

(includes ⊕ originally that comes with surfactant)