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Course 565 / 665 Lecturer Prof. Cavagnero

Day 4.23.04 Date 9:55 am

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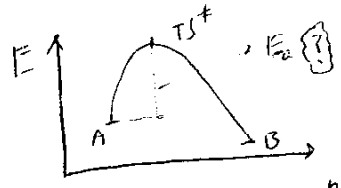

$A \xrightarrow{k} B$

$$-\frac{d[A]}{dt} = k[A] = \text{rate} \quad \Rightarrow \quad \ln\frac{[A]}{[A_0]} = -kt$$

$$[A] = [A_0]\exp(-kt)$$

or $$\frac{d[B]}{dt} = k[A] = k([A_0]-[B]) \quad \Rightarrow \quad \ln\frac{[A_0]-[B]}{[A_0]} = -kt$$

$[A_0] \equiv B_\infty$ so $[B] = [B_\infty]\{1-\exp(-kt)\}$.

Hydrophobic effect

e.g. oil dislike water.

└ non polar hydrocarbon. (C. H).

non polar side chains in naturally occurring amino acids:

Ala, Leu. Ile. Val. phe. Tyr.

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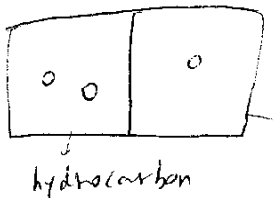
hydrophobic effect: tendency of nonpolar solutes to minimize their exposure to aqueous solvent.

1. caused by strong interactions among np side chains ?
2. or better $H_2O - H_2O$ interactions

In liquid water, there are average of 2-3 H-bonds per molecule.

transfer experiment.



o : nonpolar solute

at equilibrium:

$$\mu_1 = \mu_2$$

$$\text{so } \mu_1^\circ + RT \ln C_1 = \mu_2^\circ + RT \ln C_2$$

$$\Delta\mu^\circ = \mu_2^\circ - \mu_1^\circ = RT \ln \frac{C_1}{C_2}$$