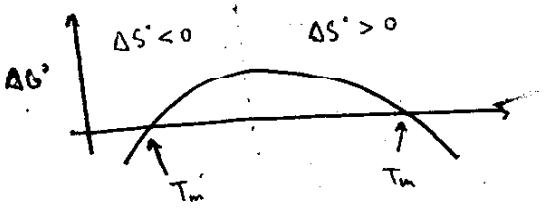
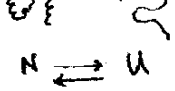
PRINT NEATLY *** USE A BLACK PEN *** DO NOT STAPLE

Course 565/665 Lecture Number ____ Date 4/8/03

Lecturer Dr. Silvia Cavagnero Note Taker Eric Fulmer

Stability Curves





$N \rightleftarrows U$

N = Native State

U = Unfolded State

$$\Delta G^\circ = \Delta H^\circ_m \left(1 - \frac{T}{T_m}\right) + \Delta C_p \left(T - T_m - T \ln\left(\frac{T}{T_m}\right)\right)$$

$$\Delta G^\circ = G^\circ_{final} - G^\circ_{initial} = G^\circ_U - G^\circ_N$$

Some Simple Power Tricks to Understand Equilibrium

$$\Delta G^\circ = -RT \ln K_{eq}$$

① $N \longrightarrow U$ $\quad K_{NU} = \frac{a_U}{a_N} \gg 0 \Rightarrow \ln K_{NU} \gg 0$

$$\boxed{\Delta G^\circ \ll 0}$$

In general, for right shifted ~~equations~~ equilibria

$(|U| > |N|) \Rightarrow \boxed{\Delta G^\circ < 0}$

② $N \rightleftharpoons U$

$K_{NU} << 1$, $\ln K_{NU} << 0$, $\boxed{\Delta G^\circ >> 0}$

In general, for left-shifted equilibria, $\boxed{\Delta G^\circ > 0}$

③ $N \rightleftharpoons U$ $K_{NU} = 1$ when $|N| = |U|$

$\ln K_{NU} = 0 \Rightarrow \boxed{\Delta G^\circ = 0}$

④ $N \rightleftharpoons U$

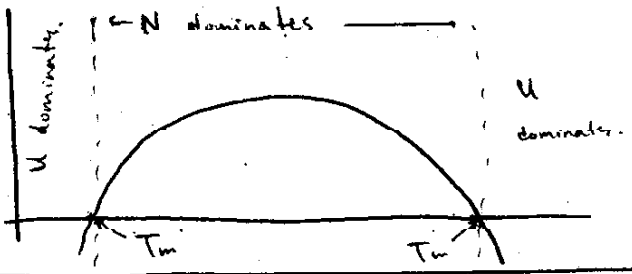
$U \rightleftharpoons N$

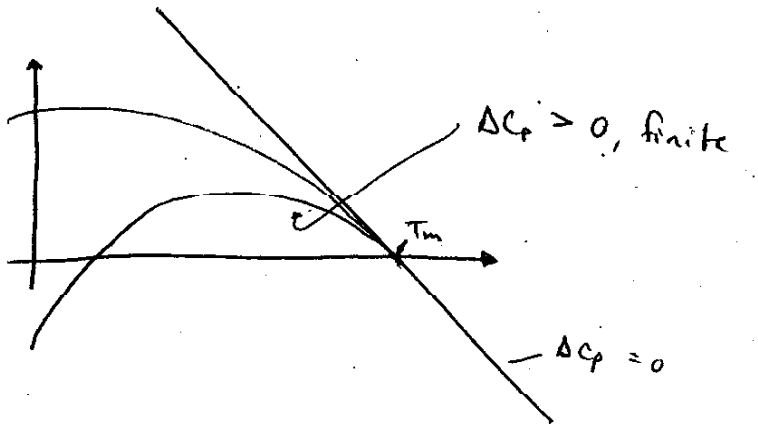
$$K_{NU} = \frac{|U|}{|N|}$$

$$K_{UN} = \frac{|N|}{|U|}$$

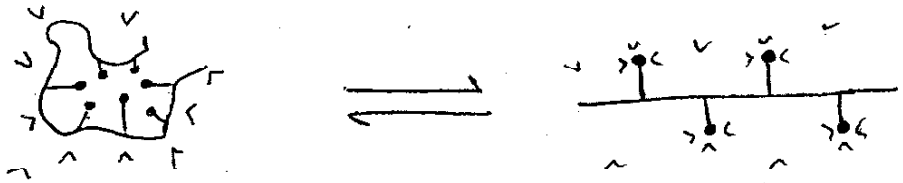
$$K_{UN} = \frac{1}{K_{NU}}, \quad \ln K_{UN} = -\ln K_{NU}$$

$$\boxed{\Delta G^\circ_{UN} = -\Delta G^\circ_{NU}}$$





$\bullet C_{pu} > \bullet C_{pn}$ Cp's are not equal.



"Iceberg Effect": High ordering of H_2O molecules around hydrophobic residues in an effort to solvate these groups. High entropic cost.