DO NOT USE PENCIL ****** DO NOT STAPLE

Submit a COPY of these notes to the GenChem Office

Course 565/665 Lecturer prof. Cavagnero

Day 3.29.04 Date 9:55 am

Notes Taken By Jiang Hong Total Number of Pages

Implications for population of E levels at variable T

if $E_j \ll kT$, $\frac{E_j}{kT} \to 0$, E_j is populated.

$E_j \sim kT$. $\frac{E_j}{kT} \sim 1$, populated.

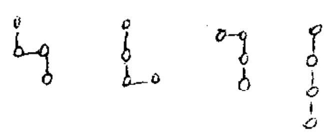
$E_j \gg kT$. $\frac{E_j}{kT} \to \infty$ not significantly populated.

kT has energy dimension, be sure to use the same units.

k: J/K, $kcal/K$. 1 cal = 4.184 J

So far, assumed 1 E level = 1 microstate

density of states

(ex)  isoenergetic degenerate

in partition function, "sum" should go over all microstates.

$W(E_l) \equiv$ # of microscopic states corresponding to a given energy level.

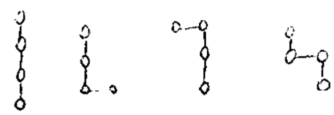
equivalently $Q = \sum_{l=1}^{l_{max}} W(E_l)\, e^{-\beta E_l}$ l: energy level.

Course 565/665 Lecturer Prof. Cavagnero
Day 3. 29. 04 Date 9:55 am
Notes Taken By J Hong Total Number of Pages

$$P_l = \frac{W(E_l)\, e^{-\beta E_l}}{Q}$$

ex

$l=1$. $E_1 = 0$. $W_1 = 1$



$l=2$, $E_2 = \varepsilon_0$, $W_2 = 4$.

$$Q = 1 + 4 \cdot e^{-\beta \varepsilon_0}$$

low T regime: $T \to 0 \Rightarrow Q = 1$

high T " : $T \to \infty \Rightarrow Q = 5$

at low T. $P_c = \frac{1}{Q} = 1$ folded state.

$P_o = 0$ open

at high T: $P_c = \frac{1}{5}$ 20% folded

$P_o = \frac{4}{5}$ 80% unfolded