

# Chapt 7

For the reaction:



At approx what temperature would you expect the forward reaction to be favored?

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

When  $\Delta G^\circ = 0$  the system is at equilibrium & neither reaction is favored. Increasing the temp. from this will give a  $-\Delta G^\circ$  meaning it favors the forward reaction.

$$0 = 131.3 \text{ kJ/mol} - T(0.1339 \text{ kJ/Kmol})$$

$$980.6 \text{ K} = T$$

So at a temperature above 980.6K the  $\Delta G^\circ$  is negative (this assumes  $\Delta G^\circ$  would be temp independant)

Using the data from the chart

$$\begin{aligned}\Delta H^\circ &= [0 + (-110.5)] - [(-241.8) + 0] \\ &= 131.3 \text{ kJ/mol}\end{aligned}$$

$$\begin{aligned}\Delta S^\circ &= [130.7 + 197.7] - [188.8 + 5.7] \\ &= 133.9 \text{ J/Kmol}\end{aligned}$$

$$= 0.1339 \text{ kJ/Kmol}$$