


$\uparrow S$ $S \rightarrow l \rightarrow g$
 fewer moles (g) \rightarrow NO moles gas

 $= n \sum p_{prod} - n \sum r_{react}$

Mar 30-7:39 AM

(386) $H_2(g) + Cl_2(g) \rightarrow 2 HCl(g)$
 $\Delta G = [2(-95.27)] - [0 + 0] = -190.54 \text{ kJ}$
 SPONT
 ALWAYS $\ominus \Delta G$
 $\Delta G = \Delta H - T \Delta S$
 Tends Spont
 $\ominus \Delta H$
 $\oplus \Delta S$
 ~~$\oplus \Delta H$~~
 ~~$\ominus \Delta S$~~

Mar 30-7:56 AM

US ΔG°

ΔG (Non std Conditions) vs ΔG° (STD CONDITIONS)

$\Delta G = \Delta G^\circ + RT \ln Q$

$R = 8.314 \text{ J/mole} \cdot \text{K}$
 $(8.314 \times 10^{-3} \text{ KJ})$

T (KELVIN)
 $Q = \frac{[Prod]^n}{[React]^n}$

Mar 30-8:03 AM

$\Delta G = \Delta G^\circ + RT \ln Q$ ← NOT AT Equilib.

Appendix "C"

~~Q~~ = $\Delta G^\circ + RT \ln K$

$\Delta G^\circ = -RT \ln K$ ← AT EQUILIB

$K > 1$ Favors Products
 $K < 1$ Favors Reactants

$K = \frac{[Prod]^n}{[React]^n}$

Mar 30-8:09 AM

$$\Delta G = -RT \ln K$$

$$= (8.314 \times 10^{-3})(298) \ln 2$$

$$\Delta G = \ominus 1.72 \text{ kJ} \quad \text{Spont.}$$

$$\Delta G = -RT \ln K$$

$$= -(8.314 \times 10^{-3})(298) \ln(0.01)$$

$$\Delta G = \oplus 11.4 \text{ kJ} \quad \text{Non-spont}$$

$K > 1$ favors prod.
 $K < 1$ fav. react

Mar 30-8:14 AM

$$\text{N}_2 + \text{H}_2 \rightleftharpoons \text{NH}_3 \quad \text{AT EQ}$$

Find K @ 25°C , $\Delta G^\circ = -33.3 \text{ kJ/mole}$

$$\Delta G = -RT \ln K$$

$$-33.3 = -(8.314 \times 10^{-3})(298) \ln K$$

$$K = 6.87 \times 10^5$$

Mar 30-8:19 AM

$$19 / 76 + 80$$

Mar 30-8:25 AM