

(15.42) a) $I_2(g) \rightleftharpoons 2I(g)$ $K_c = 3.1 \times 10^{-5}$
 $3.6 \times 10^{-2} \text{ g}$ $2.67 \times 10^{-3} \text{ I}$ 10L vessel
 800 K

$\frac{K_c}{1} = \frac{[I]^2}{[I_2]}$

$\frac{3.1 \times 10^{-5}}{1} = \frac{(2.1 \times 10^{-5})^2}{[I_2]}$

$[I_2] = 1.43 \times 10^{-5} \text{ M } I_2$

$\frac{2.67 \times 10^{-3} \text{ g } I}{10 \text{ L}} \times \frac{1 \text{ mole } I}{127 \text{ g } I} = 2.1 \times 10^{-5} \text{ M } I$

$\frac{1.43 \times 10^{-5} \text{ moles } I_2}{10 \text{ L}} \times 254 \text{ g } I_2 = 0.036 \text{ g } I_2$

moles \rightarrow g
 $\downarrow \times$
 M

Feb 9-7:37 AM

(15.42) b) $2SO_2 + O_2 \rightleftharpoons 2SO_3$ $\Delta n = n_{\text{prod}} - n_{\text{react}} = 2 - (2+1) = -1$
 $K_p = 3 \times 10^4$
 700K
 2L

$\frac{K_c}{1} = \frac{[SO_3]^2}{[SO_2]^2 [O_2]}$

$\frac{1723260}{1} =$

$K_p = K_c (RT)^{\Delta n}$
 $3 \times 10^4 = K_c [0.08206 (700)]^{-1}$
 $\frac{3 \times 10^4}{1} = K_c [0.08206 (700)]^{-1}$
 $K_c = 1723260$

Feb 9-8:00 AM

$N_2 + 3H_2 \rightleftharpoons 2NH_3$ $K_p = 1.45 \times 10^{-5}$

I			
Δ			500°C (773K)
E	0.432 atm	0.928 atm	? atm

$$K_p = \frac{(NH_3)^2}{(N_2)(H_2)^3}$$

$$\frac{1.45 \times 10^{-5}}{1} = \frac{(NH_3)^2}{(0.432)(0.928)^3}$$

$$(NH_3) = \sqrt{(1.45 \times 10^{-5})(0.432)(0.928)^3} = 2.2 \times 10^{-3}$$

Feb 9-8:09 AM

$H_2(g) + Br_2(g) \rightleftharpoons 2HBr(g)$ 2L, 700K

mols

1.374g H_2 70.31g Br_2

I	0.3435M	0.220	
Δ	-0.202	-0.202	+0.404
E	0.1415M	0.018M	0.404M

MOLE RATIO

$K_{eq} = \frac{(HBr)^2}{(H_2)(Br_2)} = \frac{(0.404)^2}{(0.1415)(0.018)} = 64.08$

0.566g H_2 → K_{eq}

Feb 9-8:15 AM

	H_2	+	I_2	\rightleftharpoons	$2 HI$	$K_c = 50.5$ $448^\circ C$
I	1M		2M		\emptyset	
Δ	$-x$		$-x$		$+2x$	
E	$1-x$ <small>0.065</small>		$2-x$ <small>1.065</small>		$2x$ <small>1.87</small>	$\leftarrow F_{ind} [E]$

$$50.5 K_c = \frac{[HI]^2}{[H_2][I_2]} = \frac{(2x)^2}{(1-x)(2-x)} = \frac{4x^2}{x^2 - 3x + 2}$$

Feb 9-8:35 AM

$$\frac{4x^2}{x^2 - 3x + 2} = \frac{50.5}{1}$$

$$4x^2 = 50.5x^2 - 151.5x + 101$$

$$46.5x^2 - 151.5x + 101 = 0$$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

~~$x_1 = 2.321$~~
 $x_2 = 0.935$

$(1-x)^2$

Feb 9-8:44 AM

$K_p = 0.497$
500K

I	P_{U_5} 1.66 atm	P_{U_3} x	U_2 x
Δ	-x	+x	+x
E	1.66-x <u>0.967</u> 0.693	x <u>0.693</u>	x <u>0.693</u>

← Pressure at Eq?

$$K_p = \frac{(P_{U_3})(U_2)}{(P_{U_5})} = \frac{(x)(x)}{(1.66-x)} = 0.497$$

~~$x_1 = 1.19$~~
 $x_2 = 0.693$

$$x^2 = 0.825 - 0.497x$$

$$x^2 + 0.497x - 0.825 = 0$$

Feb 9-8:50 AM

Q vs K

$\frac{[Prod]^{coeff}}{[React]^{coeff}}$

NOT AT Equilibrium. equilibrium constant

All # AT Equilibrium

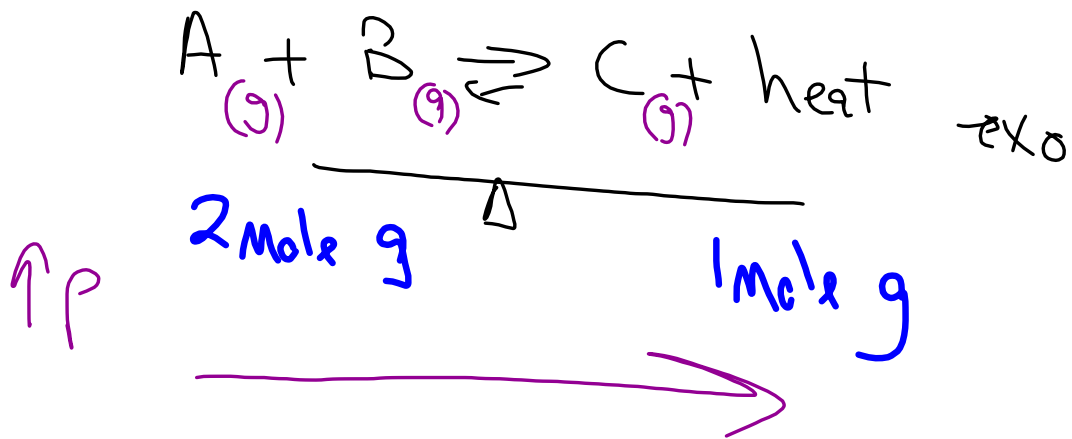
Self Where are we?

- ① If $Q = K \Rightarrow$ AT EQ
- ② If $Q > K$ went too far ← Go back
- ③ If $Q < K$ NOT There yet, go forward

Feb 9-8:55 AM

Le Chatlier's Principle Shultz

If Then Statements.



Feb 9-9:05 AM

PS 15-1 # 1-17

Feb 9-9:15 AM