15.22 $2Cl_2 + 2H_2O \rightleftarrows 4HCl + O_2$ All (gases)

2 → 2½

② $Cl_2 + H_2O \rightleftarrows 2HCl + \frac{1}{2}O_2$

$K_p = 0.274$

$PV = nRT$

$P = \frac{(n/V)}{M}RT$

$K_p = K_c(RT)^{\Delta n}$

$\Delta n = n_{prod} - n_{react}$

$K_c = K_p(RT)^{-\Delta n}$

$= (0.274)\left[(0.08206)(753)\right]^{1/2}$

$= 0.035$

2½ − 2 = ½

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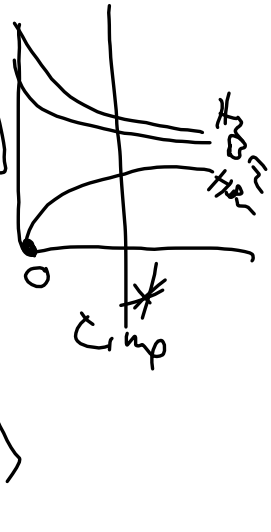
15.32 $H_2 + Br_2 \rightleftarrows 2HBr$

1.374 g 70.31 g 2 L

(I) H_2: $\frac{1.374\ g\ H_2}{2\ L} \left| \frac{1\ mol\ H_2}{2\ g\ H_2} \right| = 0.3435\ M\ H_2$ (I) START

(I) Br_2: $\frac{70.31\ g\ Br_2}{2\ L} \left| \frac{1\ mol\ Br_2}{160\ g\ Br_2} \right| = 0.22\ M\ Br_2$ (I)

(E) $\frac{0.566\ g\ H_2}{2\ L} \left| \frac{1\ mol\ H_2}{2\ g\ H_2} \right| = 0.1415\ M\ H_2$ (E)



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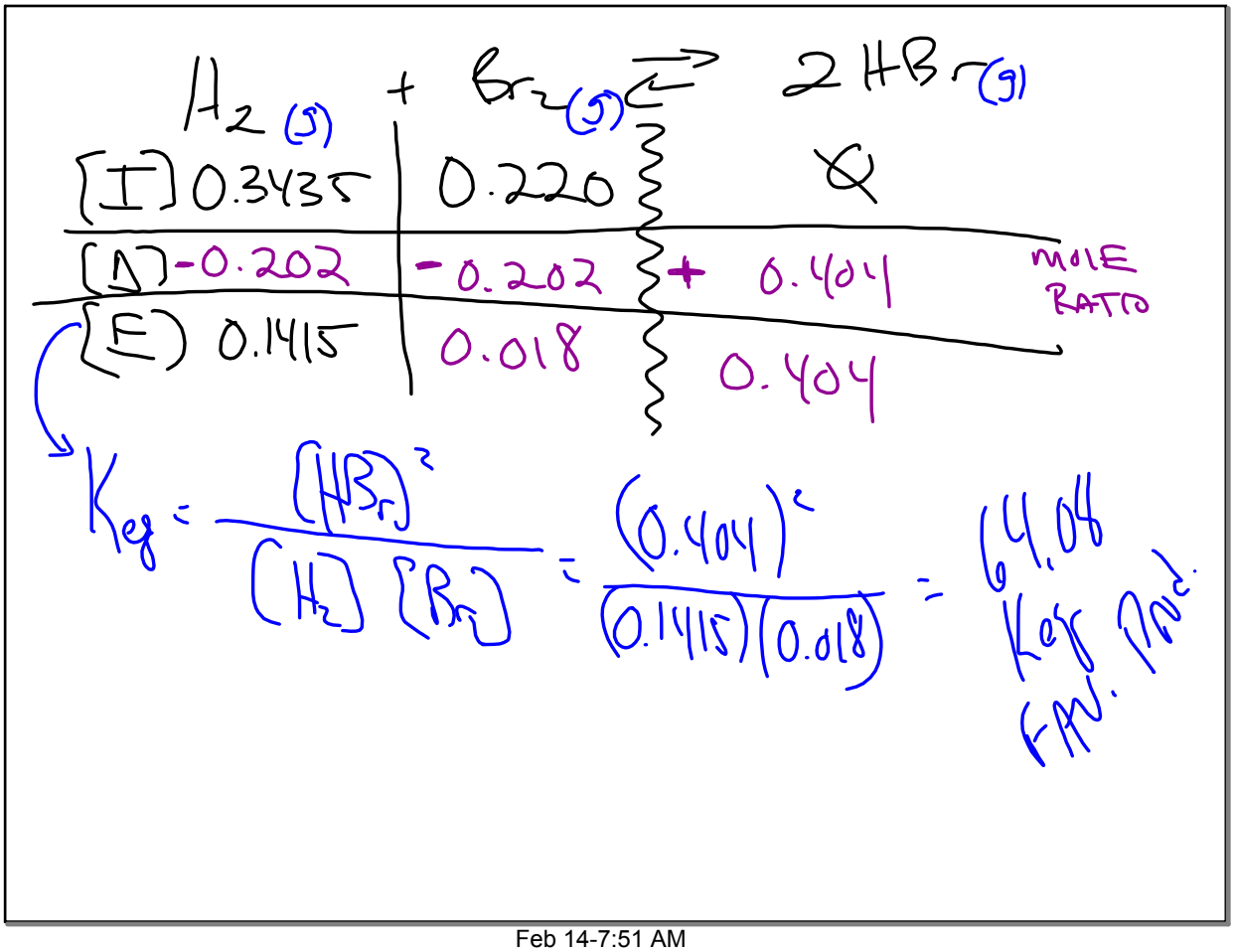

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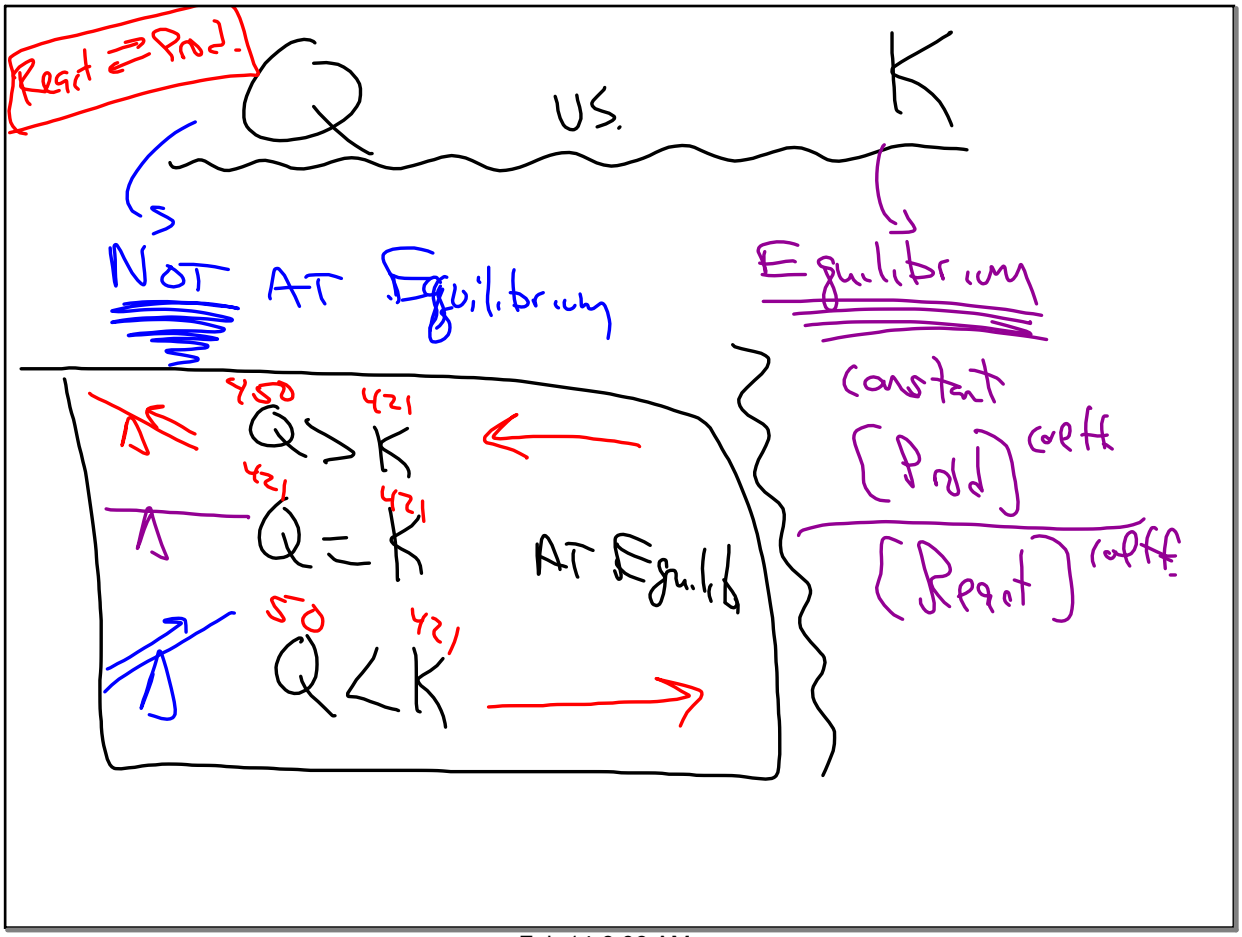

Feb 14-8:06 AM

p645 5.10

$H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)}$ $K_c = 50.5$

Q ⇒ 0.5×10^{-2} M / 1.5×10^{-2} M / 1×10^{-2} M

time "t"

$Q < K$ →

$$Q = \frac{[HI]^2}{[H_2][I_2]} = \frac{(1\times10^{-2})^2}{(0.5\times10^{-2})(1.5\times10^{-2})} = 1.33$$ Q

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The unknown!

$K_c = 50.5$

$1H_{2(g)} + 1I_{2(g)} \rightleftharpoons 2HI_{(g)}$ Q

	1	2		
I				
Δ	−x	−x	+2x	Mole Ratio
E	1−x	2−x	2x	1 : 1 : 2
X=0.935	0.065	1.065	1.87	

$ax^2+bx+c=0$ Quadratic Formula

$$K = \frac{[HI]^2}{[H_2][I_2]} = \frac{(2x)^2}{(1-x)(2-x)} = \frac{50.5}{1}$$

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

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

$-4x^2 \quad -4x^2$

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

a b c

$x_1 = 2.323$ 1 − x No neg concentrations.

$x_2 = 0.935$ ☺

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15/37 a+b, 44

Feb 14-8:44 AM