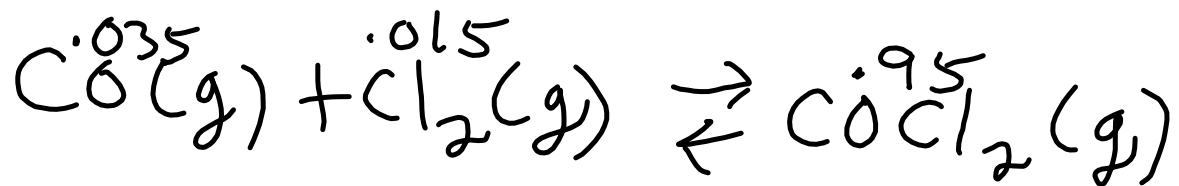


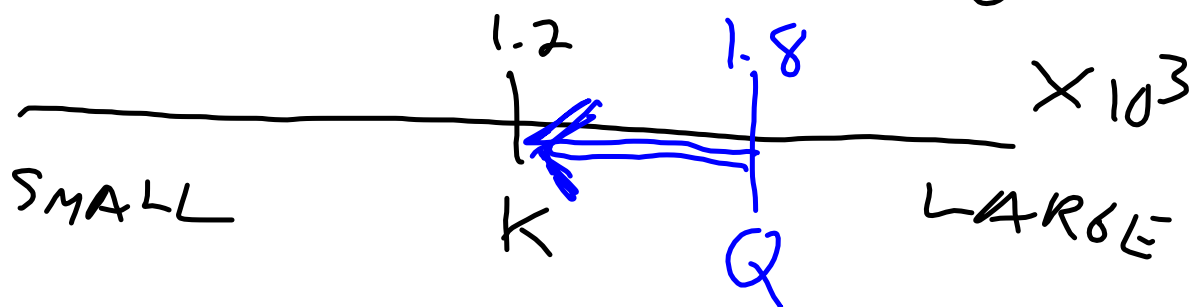
$$K_c = \sqrt{\frac{1}{1.52}}$$

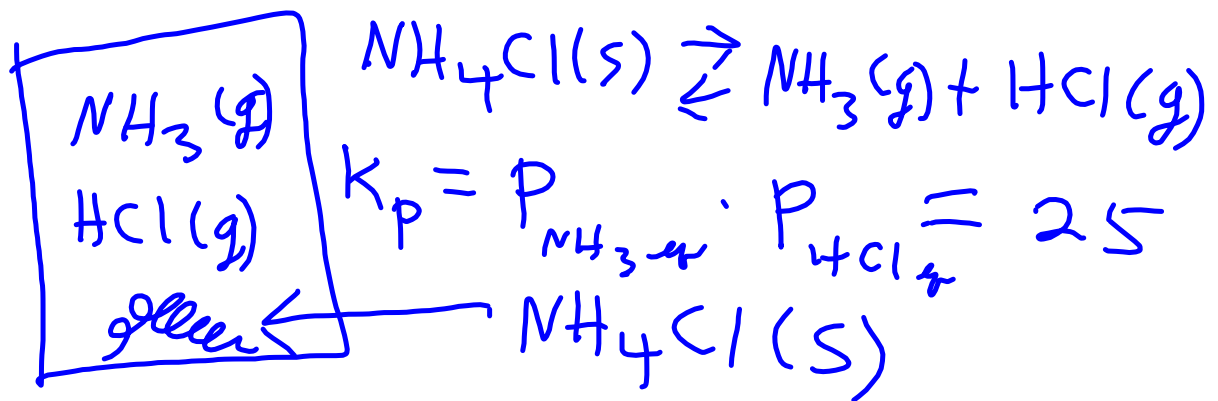
$$\sqrt{1.52} \rightarrow \frac{1}{\sqrt{1.52}}$$



$$K_c = \frac{[COCl_2]_{eq}}{[CO]_{eq} [Cl_2]_{eq}} = 1.2 \times 10^3$$

$$Q_c = \frac{[COCl_2]}{[CO][Cl_2]} = \frac{(0.95)}{(0.035)(0.015)} = 1.8 \times 10^3$$





$$P_{\text{HCl}} = P_{\text{NH}_3}$$

$$K_p = P_{\text{NH}_3} \cdot P_{\text{NH}_3} = P_{\text{NH}_3}^2 = 25$$

$$P_{\text{NH}_3} = 5 \text{ atm}$$

$$\begin{aligned}
 P_{\text{TOTAL}} &= P_{\text{NH}_3} + P_{\text{HCl}} \\
 &= 5 \text{ atm} + 5 \text{ atm} = 10 \text{ atm}
 \end{aligned}$$



$$K_p = \frac{P_{\text{NO}_2}^2}{P_{\text{N}_2\text{O}_4}} = 0.660$$

	N_2O_4	NO_2
I	0.10	0.10
C	-X	+2X
E	0.10 - X	0.10 + 2X

$$Q_p = \frac{P_{\text{NO}_2}^2}{P_{\text{N}_2\text{O}_4}} = \frac{(0.10)^2}{0.10} = 0.10$$

LIMITS OF X $0 < X < 0.10$

$$K_p = \frac{P_{\text{NO}_2}^2}{P_{\text{N}_2\text{O}_4}} = \frac{(0.10 + 2x)^2}{(0.10 - x)} = 0.660$$

$$(0.10 + 2x)^2 = 0.660(0.10 - x)$$

$$4x^2 + 0.40x + 0.010 = 0.0660 - 0.660x$$

$$4x^2 + 1.06x - 0.056 = 0$$

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

$$a = 4 \quad b = 1.06 \quad c = -0.056$$

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

$$x = \frac{-1.06 + \sqrt{(1.06)^2 - 4(4)(-0.056)}}{2(4)}$$

$$x = 0.0451$$

$$\begin{aligned} P_{\text{NO}_2} &= 0.10 + 2x = 0.10 + 2(0.0451) \\ &= 0.10 + 0.0902 \\ &= 0.1902 \end{aligned}$$

$$\begin{aligned} P_{\text{N}_2\text{O}_4} &= 0.10 - x \\ &= 0.10 - 0.0451 = 0.0549 \end{aligned}$$

$$\begin{aligned} K_p &= \frac{P_{\text{NO}_2}^2}{P_{\text{N}_2\text{O}_4}} = \frac{(0.1902)^2}{0.0549} = 0.659 \\ &\approx 0.660 \end{aligned}$$