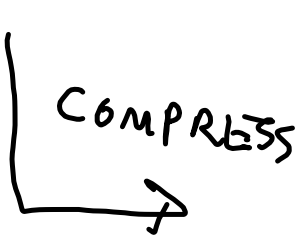
$$aA(s) + bB(aq) \rightleftarrows cC(g) + dD(\ell)$$

$$K_c' = \frac{[C]_{eq}^{c}[D]_{g}^{d}}{[A]_{eq}^{a}[B]_{g}^{b}}$$

$$\frac{[A]_{eq}^{a}}{[D]_{eq}^{d}} \cdot K_c' = \frac{[A]_{eq}^{a}}{[D]_{eq}^{d}} \cdot \frac{[C]_{eq}^{c}[D]_{eq}^{d}}{[A]_{eq}^{a}[B]_{eq}^{b}}$$

$$K_c = \frac{[C]_{eq}^{c}}{[B]_{eq}^{b}}$$

$$[gas] = \frac{2\ mol}{2\ L} = 1\ \frac{mol}{L}$$



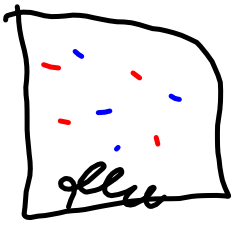
$$[gas] = \frac{2\ mol}{1\ L} = 2\ \frac{mol}{L}$$

H_2O

$$1.00 \frac{g}{mL}\left(\frac{1\ mol}{18.016\ g}\right)\left(\frac{1000\ mL}{1\ L}\right)$$

$$= 55.5 \frac{mol}{L}$$

$NH_4HS(s) \rightleftarrows NH_3(g) + H_2S(g)$



$K_p = P_{NH_3\,g} \cdot P_{H_2S\,g}$

$= (0.383)(0.383) = 0.147$

$P_{TOTAL} = P_{NH_3\,g} + P_{H_2S\,g} = 0.766\ atm$

$P_{H_2S\,g} = P_{NH_3\,g}$

$P_{TOTAL} = P_{NH_3\,g} + P_{NH_3\,g} = 2P_{NH_3\,g} = 0.766\ atm$

$\downarrow$

$P_{NH_3\,g} = \frac{0.766\ atm}{2}$

$= 0.383\ atm$

$P_{H_2S\,g} = P_{NH_3\,g} = 0.383\ atm$

$$2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$$

$$\Delta n = (2\ mol) - (2\ mol + 1\ mol)$$

$$= 2\ mol - 3\ mol$$

$$= -1\ mol$$

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

$$= 2.7 \times 10^2 \cdot \left(0.08206(960)\right)^{-1}$$

$$= \frac{2.7 \times 10^2}{0.08206(960)} = 3.4$$

$2NO_2(g) \rightleftharpoons N_2O_4 \quad K_p = 1.52$

$N_2O_4(g) \rightleftharpoons 2NO_2 \quad K_p = \frac{1}{1.52} = 0.658$