Period 21

- Go over Keq worksheet #2 1-4

- Quiz tomorrow Keq math

- Trial Keq

    Example #7

        $SO_{3(g)}$ + $NO_{(g)}$ ⇔ $SO_{2(g)}$ + $NO_{2(g)}$
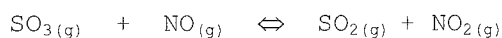
Initially, 0.50 mol of each reactant and 0.30 mol of each product are placed in a 1.00 L flask. When equilibrium is established, what is the equilibrium concentration of SO_2 if Keq is 1.5 x 10^{-2}?

    Answer #7

Because we don't know which way the equilibrium will shift, we should try the initial concentrations in the Keq expression and compare the result with Keq.

$$Keq = \frac{[SO_2][NO_2]}{[SO_3][NO]} \qquad Ktrial = \frac{(0.30)(0.30)}{(0.50)(0.50)} = 0.36$$

Because Ktrial > Keq the equilibrium will shift LEFT in order to bring the fraction down to the correct value.

	SO_3	NO	SO_2	NO_2
I	0.50	0.50	0.30	0.30
C	+X	+X	-X	-X
E	0.50+X	0.50+X	0.30-X	0.30-X

$$Keq = \frac{[SO_2][NO_2]}{[SO_3][NO]} \qquad 0.015 = \frac{(0.30-X)(0.30-X)}{(0.50+X)(0.50+X)}$$

$$0.015 = \frac{(0.30-X)^2}{(0.50+X)^2} \qquad \text{root both sides}$$

$$0.122 = \frac{(0.30-X)}{(0.50+X)}$$

0.122(0.50+X) = 0.30 − X $[SO_2]$ = 0.30 − X
0.0612 + 0.122 X = 0.30 − X   = 0.30 − 0.213
0.239 = 1.122 X   = 0.0873
0.213 = X   = 0.087 M

- Assignment: - Keq worksheet #2
                 - Page 539/540 #1-9

- Quiz tomorrow Keq math

PS #10

Hebden #47-65 (odd #)