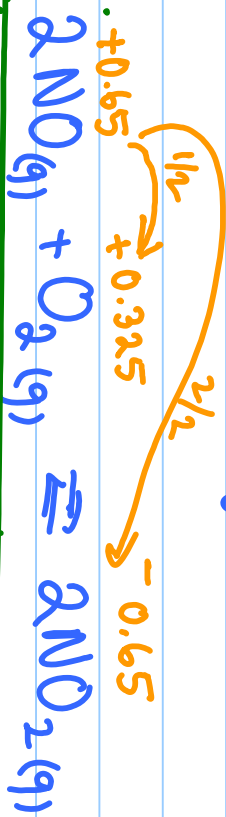


A Couple of Keg Problems

1. A certain amount of NO_2 was placed in a 2.00 L flask. When equilibrium was reached, the $[\text{NO}]$ was 0.650 M.

Keg = 24.0. How many moles of NO_2 were placed in the container?



$X = \text{initial } [\text{NO}_2]$

[I]	0	0	X
[C]	+0.65	+0.325	-0.65
[E]	0.65	0.325	X - 0.65

$$K_{eq} = \frac{[NO_2]^2}{[NO]^2 [O_2]}$$

$$24.0 = \frac{(x - 0.65)^2}{(0.65^2)(0.325)}$$

$$(x - 0.65)^2 = 24.0 \times 0.65^2 \times 0.325$$

$$(x - 0.65)^2 = 3.2955$$

$$x - 0.65 = \sqrt{3.2955} = 1.81535$$

$$x = 1.81535 + 0.65 = \underline{2.465 \text{ M}}$$

Initial $[NO_2]$ $x = 1.81535 + 0.65 = \underline{2.465 \text{ M}}$

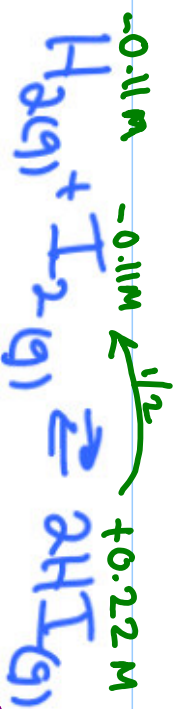
$$\left(\frac{\text{mol}}{\text{M} \cdot \text{L}} \right)$$

$$\text{mol} = M \times L$$

$$= 2.465 \text{ M} \times 2.0 \text{ L} = \underline{4.9 \text{ mol } NO_2}$$



Equal moles of H_2 & I_2 are placed in a 1.0 L container. At equilibrium $[\text{HI}] = 0.22 \text{ M}$
 Calculate the initial $[\text{I}_2]$



$[\text{I}]$	x	x	0
$[\text{G}]$	-0.11	-0.11	+0.22
$[\text{E}]$	x-0.11	x-0.11	0.22

$$K_{\text{eq}} = \frac{[\text{HI}]^2}{[\text{H}_2][\text{I}_2]}$$

$$64.0 = \frac{(0.22)^2}{(x-0.11)^2}$$

$$8.0 = \frac{0.22}{x-0.11}$$

$$8.0(x-0.11) = 0.22$$

$$8.0x - (8.0)(0.11) = 0.22$$

$$8.0x - 0.88 = 0.22$$

$$8.0x = 1.10$$

$$x = \frac{1.10}{8.0} = \underline{0.1375 \text{ M}}$$

So initial $[H_2] = [I_2] = \underline{0.14 \text{ M}}$