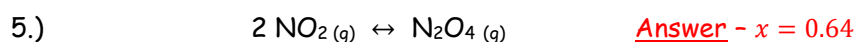
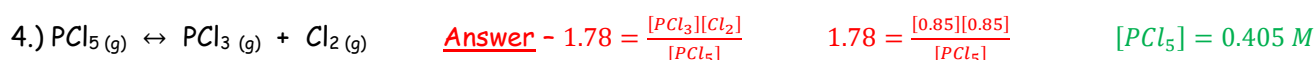
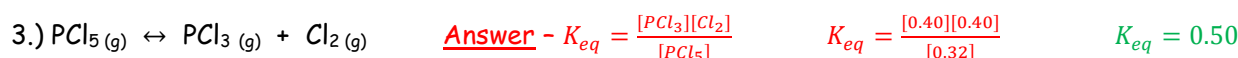
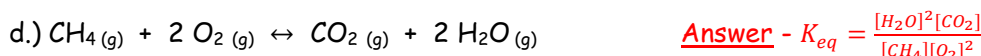
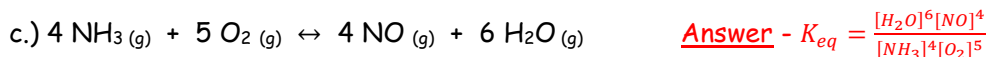


Intro to Keq Calculations

1.) In a Keq equation (equilibrium expression) the reactants appear in the denominator of the expression.



I	2.0	0
C	-2x	+x
E	2.0 - 2x	0.64

Therefore $\rightarrow [\text{CO}_2] = 2.0 - 2(0.64)$

$[\text{CO}_2] = 0.72 \text{ M}$



I	0.30	0.20	0
C	-x (= -0.040)	-2x (= -0.080)	+2x (2x = 0.080)
E	0.26	0.12	0.080

$K_{eq} = 1.7$



I	0.40	0.40	0.40	0.40
C	-x	-x	+x	+x
E	0.40 - x	0.40 - x	0.40 + x	0.40 + x

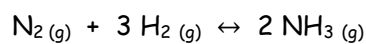
$K_{trial} = 1.0$

$K_{eq} = \frac{[\text{H}_2][\text{CO}_2]}{[\text{H}_2\text{O}][\text{CO}]}$ $1.50 = \frac{[0.40+x][0.40+x]}{[0.40-x][0.40-x]}$

$\sqrt{1.50} = \sqrt{\frac{[0.40+x]^2}{[0.40-x]^2}}$ $1.2247 = \frac{[0.40+x]}{[0.40-x]}$ $x = 0.040408$ $[\text{CO}_2] = 0.44 \text{ M}$

$\text{CO} = 0.40 - 0.040408$ $[\text{CO}] = 0.36 \text{ M}$

8.)



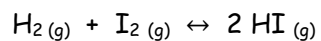
I	0.10	0.50	0
C	$-x$ ($= -0.06$)	$-3x$ ($= -0.18$)	$+2x$ ($2x = 0.12$)
E	0.04	0.32	0.12

Answer - $K_{eq} = \frac{[\text{NH}_3]^2}{[\text{N}_2][\text{H}_2]^3}$

KEY
 $K_{eq} = \frac{[0.12]^2}{[0.04][0.32]^3}$

$$K_{eq} = 11$$

9.)



I	0.40	0.40	0
C	$-x$	$-x$	$+2x$
E	$0.40 - x$	$0.40 - x$	$+2x$

Answer - $K_{eq} = \frac{[\text{HI}]^2}{[\text{H}_2][\text{I}_2]}$ $400 = \frac{[2x]^2}{[0.40-x][0.40-x]}$

$$400 = \frac{[2x]^2}{[0.40-x]^2} \quad \sqrt{400} = \sqrt{\frac{[2x]^2}{[0.40-x]^2}}$$

$$x = 0.363636$$

$$H_2 = 0.40 - 0.36$$

$$[\text{H}_2] = 0.036 \text{ M}$$