**SCH4UI - Practice Chapter 7 Problems**

1. Consider the equilibrium below:

   If 1.5 moles of $PCl_5$ was placed into a 1.0 L container and allowed to reach equilibrium, what would the value of $K_c$ be if at equilibrium $[PCl_5] = 1.2$ mol/L?

   $PCl_{3(g)} + Cl_{2(g)} \leftrightarrow PCl_{5(g)}$

2. Consider the equilibrium below:

   If 1.2 moles of $H_2$ and 1.2 moles of $I_2$ was placed into a 1.0 L container and allowed to reach equilibrium, what would the value of $K_c$ be if at equilibrium [HI] = 0.40 mol/L?

   $H_{2(g)} + I_{2(g)} \leftrightarrow 2HI_{(g)}$

3. Consider the equilibrium below:

   If 1.6 moles of HI was placed into a 2.0 L container and allowed to reach equilibrium, what would the equilibrium concentrations be for $H_{2(g)}$, $I_{2(g)}$, and $HI_{(g)}$ if the $K_c = 36$?

   $H_{2(g)} + I_{2(g)} \leftrightarrow 2HI_{(g)}$

4. The equilibrium system shown below has a $K_c = 1.4 \times 10^{-4}$. If [A] = 0.24 mol/L, what is the [D]?

   $3A_{(g)} + B_{(s)} \leftrightarrow C_{(s)} + 2D_{(g)}$

5. Consider the equilibrium below:

   1.0 moles of $H_2$ and 1.0 moles of $I_2$ was placed into a 1.0 L container and allowed to reach equilibrium. $H_{2(g)} + I_{2(g)} \leftrightarrow 2HI_{(g)}$

   a. What would the value of $K_c$ be if at equilibrium [HI] = 0.20 mol/L?
   b. What would be the new concentrations of $[H_{2(g)}]$, $[I_{2(g)}]$, and $[HI_{(g)}]$ if the equilibrium in (a) was disturbed by the addition of 0.2 moles of $I_{2(g)}$ (assume no change in volume or pressure)?