Warmup: Calculating Equilibrium Concentrations

Nitrogen gas and hydrogen gas react to produce ammonia

$$\_\_\_ N_{2(g)} + \_\_\_ H_{2(g)} \leftrightharpoons \_\_\_\_ NH_{3(g)}$$

If 0.750 mol of nitrogen and 2.250 mol of hydrogen are placed in a 5.0 L vessel, what is the equilibrium constant if the equilibrium mixture contains 0.060 mol of ammonia?

Amount			
Initial			
Change			
Equilibrium			

Station #1

When 1.0 mol CO and 3.0 mol H_2 are placed in a 10.00 L vessel and allowed to come to equilibrium the mixture is found to contain 0.387 mol H_2O. Calculate the K for the reaction.

$$\_\_CO_{(g)} + \_\_H_{2(g)} \leftrightharpoons \_\_CH_{4(g)} + \_\_H_2O_{(g)}$$

Amount				
Initial				
Change				
Equilibrium				

Station #2

At 25°C the value of K_{eq} for the following reaction is 82

$$\_\_\_ I_{2(g)} + \_\_\_ Cl_{2(g)} \leftrightharpoons \_\_\_ ICl_{(g)}$$

If 0.83 moles of both $I_{2(g)}$ and $Cl_{2(g)}$ are placed in a 10.0 L container at 25°C, what are the concentrations of the three gases at equilibrium?

Amount			
Initial			
Change			
Equilibrium			

Station #3

The K_{eq} for the following reaction is 4.8

$$\_\_\_ SO_{2(g)} + \_\_\_ NO_{2(g)} \leftrightharpoons \_\_\_ NO_{(g)} + \_\_\_ SO_{3(g)}$$

In a 1.0L container the chemist added 1.7×10^{-1} mol of $SO_{2(g)}$ to 1.1×10^{-1} mol of $NO_{2(g)}$. What are the equilibrium concentrations of all four gasses?

Amount				
Initial				
Change				
Equilibrium				

Station #4

When nitrogen gas and chlorine gas react to form nitrogen trichloride gas, $K_{eq} = 4.15 \times 10^{-5}$.

$$\_\_\_ N_{2(g)} + \_\_\_ Cl_{2(g)} \leftrightharpoons \_\_\_ NCl_{3(g)}$$

If 2.74 mol of nitrogen gas and 0.84 mol of chlorine gas are put in a 2.0 L reaction vessel, what is the equilibrium concentration of the nitrogen trichloride?

Amount			
Initial			
Change			
Equilibrium			