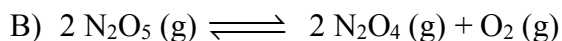
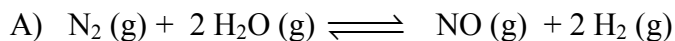


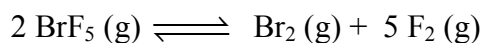
REVIEW QUESTIONS

Chapter 16

1. Write equilibrium constant expressions for each reaction below:



2. At 1500 K the following equilibrium is established:



At equilibrium,

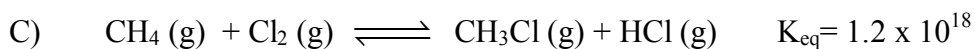
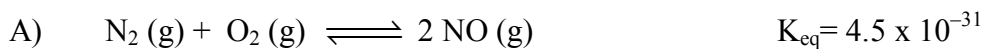
$$[\text{BrF}_5] = 0.0064 \text{ M}$$

$$[\text{Br}_2] = 0.0018 \text{ M}$$

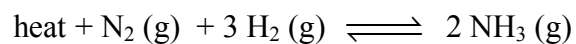
$$[\text{F}_2] = 0.0090 \text{ M.}$$

Calculate the equilibrium constant for this reaction.

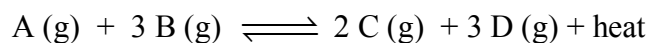
3. For each reaction below, determine whether reactants or products are favored at equilibrium:



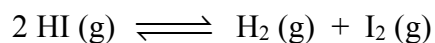
4. In the equilibrium shown below, identify four changes that would increase the concentration of ammonia equilibrium:



5. For the equilibrium shown below, describe the changes that occur after each action listed:



- Temperature is increased
 - More A is added
 - Some D is removed
 - Volume is decreased
6. 0.100 moles of HI was placed in a 1.0-L flask and allowed to decompose as shown below:

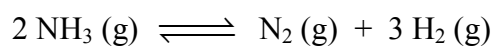


At equilibrium, the 0.011 moles of H_2 was present. Calculate the equilibrium constant for this reaction. (Hint: set up a reaction table)

7. A 0.15 M solution of butanoic acid ($\text{HC}_4\text{H}_7\text{O}_2$) has $[\text{H}_3\text{O}^+] = 1.51 \times 10^{-3} \text{ M}$. Calculate K_a for this acid.

8. A 0.035 M solution of a weak acid (HA) has a pH of 4.88. Calculate the K_a for this acid.

9. In a reaction, 0.15 moles of NH_3 is placed in a 1.5-L flask and allowed to decompose as shown below:



At equilibrium, 0.035 moles of N_2 were present. Determine the percent yield of this reaction.

10. Determine the pH and percent ionization of 1.0 M acetic acid ($K_a=1.8 \times 10^{-5}$).
11. What is the pH of a buffer solution consisting of 0.55 M acetic acid and 0.68 M sodium acetate? (K_a for acetic acid = 1.8×10^{-5})
12. The K_{sp} value for AgI is 8.5×10^{-17} . What is the molar solubility of AgI?
13. The solubility of CaF_2 is 2.14×10^{-4} M. Calculate the K_{sp} for CaF_2 .