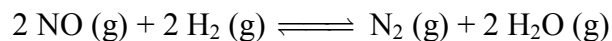


REVIEW QUESTIONS

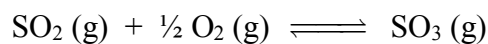
Chapter 14

1. A mixture of 0.10 mol of NO, 0.050 mol of H₂ and 0.10 mol of H₂O is placed in a 1.0-L flask and allowed to reach equilibrium as shown below:

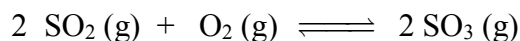


At equilibrium [NO] = 0.062 M. Calculate the equilibrium constant, K_c, for this reaction.

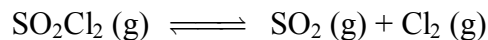
2. At 700°C, K_c = 20.4 for the reaction shown below:



Calculate K_c and K_p for the reaction shown below:

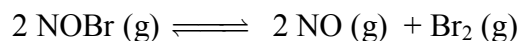


3. At 100°C, K_c = 0.078 for the following reaction:



In an equilibrium mixture, [SO₂Cl₂] = 0.136 M and [SO₂] = 0.072 M. What is the concentration of Cl₂ in the equilibrium mixture?

4. At 373 K, $K_p = 0.416$ for the equilibrium:



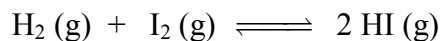
If the partial pressures of NOBr and NO are equal at equilibrium, what is the partial pressure of Br₂?

5. At 250°C, the reaction



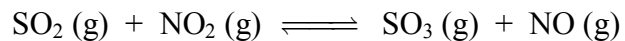
has an equilibrium constant $K_c = 1.80$. If 0.100 mol of PCl₅ is added to a 5.00-L flask, what are the concentrations of PCl₅, PCl₃ and Cl₂ at equilibrium at this temperature?

6. When 2.00 mol each of hydrogen and iodine are mixed in a 1.00-L flask, 3.50 mol of HI is produced at equilibrium:



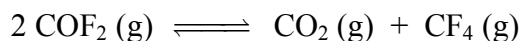
Calculate the equilibrium constant K_c for this reaction.

7. The equilibrium constant for the reaction



has a numerical value of 3.00 at a given temperature. 1.50 mol each of SO_2 and NO_2 are mixed in a 1.00-L flask and allowed to reach equilibrium. What percent of SO_2 is converted to product?

8. The following equilibrium exists at 1000 °C with $K_c = 2.00$.



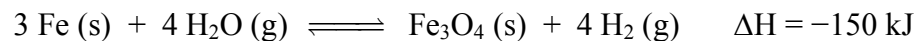
If a 5.00-L mixture contains 0.145 mol COF_2 , 0.262 mol of CO_2 and 0.074 mol of CF_4 at 1000 °C, in which direction will the mixture proceed to reach equilibrium?

9. Formamide decomposes at high temperatures according to the equation shown below:



If 0.186 mol of formamide is placed in a 2.16-L flask and allowed to decompose at 400 K, what will be the total pressure at equilibrium?

10. Predict how each of the following changes affect the amount of H₂ present in an equilibrium mixture in the reaction

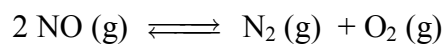


- a) Raising the temperature of the mixture.

 - b) Adding more H₂O (g).

 - c) Doubling the volume of the container holding the mixture.

 - d) Adding a catalyst.
11. At 2000 °C the equilibrium constant for the reaction below is $K_c = 2.4 \times 10^3$. If the initial concentration of NO is 0.500 M, what are the equilibrium concentrations of each substance?



12. The reaction below has an equilibrium constant $K_c = 6.90$. If 0.100 mol of BrCl is placed in a 500-mL flask and allowed to come to equilibrium, what are the equilibrium concentrations of each substance?

