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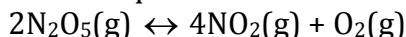


Equilibrium (Unit 11)

Equilibrium Guided Practice

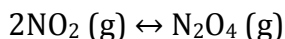
Instructions- Answer the following questions. Make sure to show all appropriate work to justify your answer.

1. Write the expression for the equilibrium constant for this reaction:



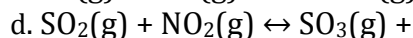
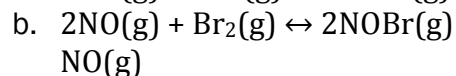
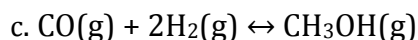
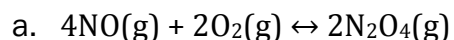
2. Calculate the equilibrium constant for the reaction in problem 1 if the equilibrium concentrations are $[\text{N}_2\text{O}_5] = 0.50 \text{ mol/L}$, $[\text{NO}_2] = 0.80 \text{ mol/L}$, $[\text{O}_2] = 0.20 \text{ mol/L}$.
3. How would the equilibrium position for the equation in problem 1 be affected by
- An addition of O_2 to the reaction vessel?
 - A decrease in the pressure?

4. The equilibrium constant for the reaction of nitrogen dioxide to form dinitrogen tetroxide is 5.6



In a one-liter container, the amount of N_2O_4 , at equilibrium, is 0.66 mol. What is the equilibrium concentration of NO_2 ?

5. Write the equilibrium constant expression for each of the following reactions.



6. What effect would an increase in pressure have on the equilibrium position of each reaction in problem 5?
7. Which value of K_{eq} indicated most favorably for product information, $K_{\text{eq}} = 1 \times 10^{12}$, $K_{\text{eq}} = 1.5$, or $K_{\text{eq}} = 5.6 \times 10^{-4}$?
8. Hydrogen sulfide gas decomposes into its elements and establishes an equilibrium at 1400°C .
- $$2\text{H}_2\text{S}(\text{g}) \leftrightarrow 2\text{H}_2(\text{g}) + \text{S}_2(\text{g})$$
- A liter of this gas mixture contains 0.18 mol H_2S , 0.014 mol H_2 , and 0.035 mol S_2 . Calculate the equilibrium constant, K_{eq} for this reaction.