

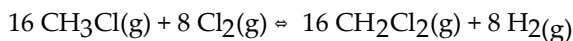
Name _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

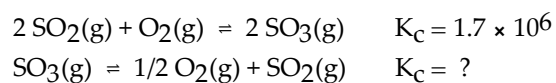
- 1) Which of the following statements is FALSE?
- A) When $K \approx 1$, neither the forward or reverse reaction is strongly favored, and about the same amount of reactants and products exist at equilibrium.
 - B) $K \gg 1$ implies that the reaction is very fast at producing products.
 - C) When $K \gg 1$, the forward reaction is favored and essentially goes to completion.
 - D) When $K \ll 1$, the reverse reaction is favored and the forward reaction does not proceed to a great extent.
 - E) None of the above.
- 2) Give the direction of the reaction, if $K \approx 1$.
- A) Neither direction is favored.
 - B) The forward reaction is favored.
 - C) If the temperature is raised, then the forward reaction is favored.
 - D) If the temperature is raised, then the reverse reaction is favored.
 - E) The reverse reaction is favored.
- 3) In which of the following reactions will $K_c = K_p$?
- A) $\text{CH}_4(\text{g}) + \text{H}_2\text{O}(\text{g}) = \text{CO}(\text{g}) + 3 \text{H}_2(\text{g})$
 - B) $\text{H}_2(\text{g}) + \text{I}_2(\text{g}) = 2 \text{HI}(\text{g})$
 - C) $\text{CO}(\text{g}) + 2 \text{H}_2(\text{g}) = \text{CH}_3\text{OH}(\text{g})$
 - D) $\text{N}_2\text{O}_4(\text{g}) = 2\text{NO}_2(\text{g})$
 - E) $\text{N}_2(\text{g}) + 3 \text{Cl}_2(\text{g}) = 2 \text{NCl}_3(\text{g})$
- 4) Which of the following statements is TRUE?
- A) Dynamic equilibrium occurs when the rate of the forward reaction equals the rate of the reverse reaction.
 - B) The equilibrium constant for the forward reaction is equal to the equilibrium constant for the reverse reaction.
 - C) A reaction quotient (Q) larger than the equilibrium constant (K) means that the reaction will favor the production of more products.
 - D) Dynamic equilibrium indicates that the amount of reactants and products are equal.
 - E) All of the above are true.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

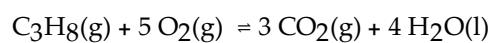
- 5) Express the equilibrium constant for the following reaction. (2 points)



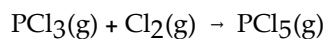
- 6) The equilibrium constant is given for one of the reactions below. Determine the value of the missing equilibrium constant. (4 points)



- 7) What is Δn for the following equation in relating K_c to K_p ? (2 points)



- 8) Phosphorous trichloride and phosphorous pentachloride equilibrate in the presence of molecular chlorine according to the reaction: (6 points)



An equilibrium mixture at 450 K contains

$P_{\text{PCl}_3} = 0.124 \text{ atm}$,

$P_{\text{Cl}_2} = 0.157 \text{ atm}$, and

$P_{\text{PCl}_5} = 1.30 \text{ atm}$. What is the value of K_c at this temperature?

9) Explain dynamic equilibrium. Use the generic reaction $A(g) = B(g)$ to explain. (2 points)

10) Why aren't solids or liquids included in an equilibrium expression? (2 points)

Answer Key

Testname: QUIZ 14.2-14.5

1) B

2) A

3) B

4) A

$$5) K = \frac{[\text{CH}_2\text{Cl}_2]^{16}[\text{H}_2]^{8}}{[\text{CH}_3\text{Cl}]^{16}[\text{Cl}_2]^{8}}$$

6) 7.7×10^{-4}

7) -3

8) 66.7

9) In this reaction, dynamic equilibrium means that the ratio of $[\text{B}]/[\text{A}]$ is constant. Even though the ratio of their concentrations is constant, the forward and reverse reactions continue to occur. The rates of the forward and reverse reactions are equal in order to keep the ratio of $[\text{B}]/[\text{A}]$ constant.

10) The equilibrium constant relates different concentrations of reactants and products to one another. Since the concentrations of liquids and solids are constant, their concentration(s) becomes part of the constant value of the equilibrium constant.