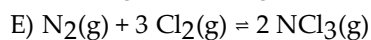
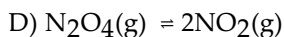
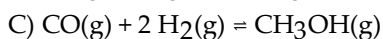
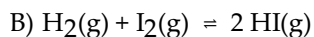
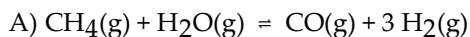


QUIZ: Chapter 14.4–14.7 (A)

Name _____

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

1) In which of the following reactions will $K_c = K_p$? 1) _____



2) Which of the following statements is TRUE? 2) _____

A) Dynamic equilibrium occurs when the rate of the forward reaction equals the rate of the reverse reaction.

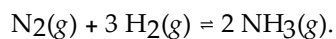
B) The equilibrium constant for the forward reaction is equal to the equilibrium constant for the reverse reaction.

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.

3) At a certain temperature, nitrogen and hydrogen react to form ammonia: 3) _____



When initial amounts of N_2 , H_2 , and NH_3 are mixed, the concentration of NH_3 increases. Which statement below is TRUE?

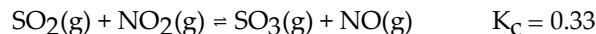
A) $K_c < Q$

B) $K_c = Q$

C) $K_c > Q$

D) More information is needed to make a statement about K_c .

4) Consider the following reaction and its equilibrium constant: 4) _____



A reaction mixture contains 0.41 M SO_2 , 0.14 M NO_2 , 0.12 M SO_3 and 0.14 M NO . Which of the following statements is TRUE concerning this system?

A) The reaction quotient will decrease.

B) The equilibrium constant will decrease.

C) The reaction will shift in the direction of products.

D) The reaction will shift in the direction of reactants.

E) The system is at equilibrium.

- 5) Which of the following statements is TRUE? 5) _____
- A) If $Q > K$, it means the reverse reaction will proceed to form more reactants.
 - B) If $Q < K$, it means the reverse reaction will proceed to form more reactants.
 - C) If $Q = K$, it means the reaction is not at equilibrium.
 - D) All of the above are true.
 - E) None of the above are true.

- 6) Consider the following reaction and its equilibrium constant: 6) _____



A reaction mixture contains 0.35 M I_2 , 0.31 M Br_2 and 3.5 M IBr . Which of the following statements is TRUE concerning this system?

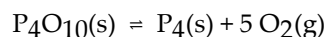
- A) The reaction quotient will decrease.
- B) The reaction will shift in the direction of products.
- C) The reaction will shift in the direction of reactants.
- D) The equilibrium constant will increase.
- E) The system is at equilibrium.

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

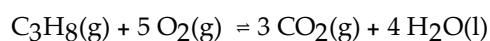
- 7) Express the equilibrium constant for the following reaction. (1 pt) 7) _____



- 8) Determine the value of K_c for the following reaction if the equilibrium concentrations are as follows: $[\text{P}_4\text{O}_{10}]_{\text{eq}} = 2.000$ moles, $[\text{P}_4]_{\text{eq}} = 3.000$ moles, $[\text{O}_2]_{\text{eq}} = 4.000$ M (3 pts) 8) _____

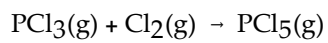


- 9) What is Δn for the following equation in relating K_c to K_p ? (1 pt) 9) _____



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

10) _____



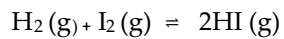
What is the value of K_c at an equilibrium mixture at 450 K if the rxn contains the following concentrations?

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

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

$$P_{\text{PCl}_5} = 1.30 \text{ atm.}$$

11)



(6pts)

11) _____

Initially, only H_2 and I_2 were present at concentrations of $[\text{H}_2] = 4.00\text{M}$ and $[\text{I}_2] = 2.85\text{M}$. The equilibrium concentration of I_2 is 0.0900M . What is the equilibrium constant, K_c , for the reaction at this temperature? (6 pts)

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

12) _____

13) How is the reaction quotient different from an equilibrium constant for a given reaction?

13) _____

Answer Key

Testname: QUIZ 14.4-14.7

- 1) B
- 2) A
- 3) C
- 4) C
- 5) A
- 6) E
- 7) $K = [\text{O}_2]$
- 8) 1024
- 9) -3
- 10) 66.7
- 11)
- 12) 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.
- 13) The expression for both are identical. However, the equilibrium constant only holds true for systems AT equilibrium. The reaction quotient can be calculated at concentrations/pressures away from equilibrium and is used to determine which direction a reaction must go to achieve equilibrium.