

# Assessment

## Chemistry: Lesson 16



## Question 1

Express the equilibrium constant for the following reaction.



A)  $K = \frac{[\text{CH}_2\text{Cl}_2] \cdot [\text{H}_2]}{[\text{CH}_3\text{Cl}] \cdot [\text{Cl}_2]}$

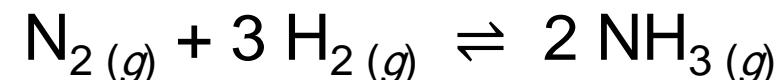
B)  $K = \frac{[\text{CH}_2\text{Cl}_2]^2 [\text{H}_2]}{[\text{CH}_3\text{Cl}]^2 [\text{Cl}_2]}$

C)  $K = \frac{[\text{CH}_3\text{Cl}]^2 [\text{Cl}_2]}{[\text{CH}_2\text{Cl}_2]^2 [\text{H}_2]}$

D)  $K = \frac{[\text{CH}_2\text{Cl}_2]^2 [\text{H}_2]}{[\text{CH}_3\text{Cl}] [\text{Cl}_2]}$

## Question 2

Express the equilibrium constant for the following reaction.



A)  $K = \frac{[\text{NH}_3]^{1/2}}{[\text{N}_2] \cdot [\text{H}_2]^{1/3}}$

B)  $K = \frac{[\text{NH}_3]}{[\text{N}_2] \cdot [\text{H}_2]}$

C)  $K = \frac{[\text{NH}_3]^2}{[\text{N}_2] \cdot [\text{H}_2]^3}$

D)  $K = \frac{[\text{N}_2] \cdot [\text{H}_2]^3}{[\text{NH}_3]^2}$

### Question 3

Which of the following is the correct expression for the equilibrium constant?

A)  $K_c = \frac{[\text{Reactants}]}{[\text{Products}]}$

B)  $K_c = [\text{Reactants}] \cdot [\text{Products}]$

C)  $K_c = \frac{[\text{Products}]}{[\text{Reactants}]}$

D)  $K_c = [\text{Reactants}] + [\text{Products}]$

## Question 4

If  $K_c \ll 1$ , the reverse reaction is favored.

- A) True
- B) False

## Question 5

If  $K_c \gg 1$ , the forward reaction is favored.

- A) True
- B) False

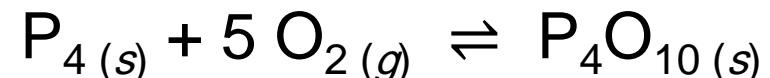
## Question 6

A chemical system is considered to have reached dynamic equilibrium when \_\_\_\_.

- A)** the amount of the products equals the amount of the reactants
- B)** all of reactants have been converted to products
- C)** the sum of the concentrations of each of the reactant species is equal to the sum of the
- D)** the rate of the forward reaction is equal to the rate of the reverse reaction.

## Question 7

Express the equilibrium constant for the following reaction.



A)  $K = \frac{[P_4] \cdot [O_2]^5}{[P_4O_{10}]}$

B)  $K = \frac{[P_4O_{10}]}{[P_4] \cdot [O_2]^5}$

C)  $K = [O_2]^{-5}$

D)  $K = [O_2]^5$

## Question 8

Express the equilibrium constant for the following reaction.



A)  $K = \frac{[\text{NaOH}]^2[\text{H}_2]}{[\text{Na}]^2[\text{H}_2\text{O}]^2}$

B)  $K = [\text{H}_2][\text{NaOH}]^{-2}$

C)  $K = \frac{[\text{Na}]^2[\text{H}_2\text{O}]^2}{[\text{NaOH}]^2[\text{H}_2]^2}$

D)  $K = [\text{H}_2][\text{NaOH}]^2$

## Question 9

Determine the value of  $K_c$  for the following reaction if the equilibrium concentrations are as follows:

$$[N_2]_{eq} = 3.6 \text{ M}$$

$$[O_2]_{eq} = 4.1 \text{ M}$$

$$[N_2O]_{eq} = 3.3 \times 10^{-18} \text{ M}$$



A)  $2.2 \times 10^{-19}$

B)  $4.5 \times 10^{18}$

C)  $2.0 \times 10^{-37}$

D)  $5.0 \times 10^{36}$

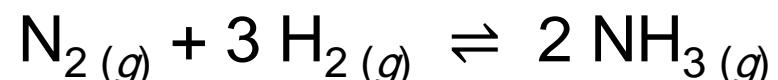
## Question 10

Determine the value of  $K_c$  for the following reaction if the equilibrium concentrations are as follows:

$$[\text{N}_2]_{\text{eq}} = 1.5 \text{ M}$$

$$[\text{H}_2]_{\text{eq}} = 1.1 \text{ M}$$

$$[\text{NH}_3]_{\text{eq}} = 0.47 \text{ M}$$



A) 3.5

B) 0.28

C) 9.1

D) 0.11