



Arjuna NEET (2024)

Chemical Equilibrium

DPP-02

1. A reversible reaction having two reactants in equilibrium if the concentration of reactants are doubled, the equilibrium constant will:
- (1) Become 4 times
 - (2) Become $\frac{1}{4}$ th times
 - (3) Become $\frac{1}{16}$ th times
 - (4) Remains the same
2. In which of the following, the reaction proceeds almost towards completion?
- (1) $k = 1$
 - (2) $k = 10$
 - (3) $k = 10^{-2}$
 - (4) $k = 10^3$
3. For the reaction $2\text{NO}_2(\text{g}) + \frac{1}{2}\text{O}_2(\text{g}) \rightleftharpoons \text{N}_2\text{O}_5(\text{g})$, if the equilibrium constant is K_p , then the equilibrium constant for the reaction. $2\text{N}_2\text{O}_5 \rightleftharpoons 4\text{NO}_2(\text{g}) + \text{O}_2(\text{g})$ would be:
- (1) K_p^2
 - (2) $\frac{2}{K_p}$
 - (3) $\frac{1}{K_p^2}$
 - (4) $\frac{1}{\sqrt{K_p}}$
4. For the hypothetical reaction, the equilibrium constant (K) values are given:
- $$\begin{aligned} \text{A} &\rightleftharpoons \text{B}, & K_1 \\ \text{B} &\rightleftharpoons \text{C}, & K_2 \\ \text{C} &\rightleftharpoons \text{D}, & K_3 \end{aligned}$$
- The equilibrium constant (K) for the reaction $\text{A} \rightleftharpoons \text{D}$ is:
- (1) $K_1 + K_2 + K_3$
 - (2) $K_1 \cdot K_2 \cdot K_3$
 - (3) $K_1 + K_2 - K_3$
 - (4) $\frac{K_1 + K_2}{K_3}$
5. Reaction $\text{A}(\text{g}) + \text{B}(\text{g}) \rightleftharpoons \text{C}(\text{g}) + \text{D}(\text{g})$.
If the concentration of A is doubled then:
- (1) Equilibrium constant (K_c) will be doubled
 - (2) Equilibrium constant (K_c) will be halved
 - (3) Equilibrium constant (K_c) remains unaffected
 - (4) Equilibrium constant (K_c) will become four times
6. The equilibrium constant K_c for the reaction $\text{H}_2(\text{g}) + \text{I}_2(\text{g}) \rightleftharpoons 2\text{HI}(\text{g})$ at 700 K is 49.
What is the equilibrium constant for the reaction $\text{HI}(\text{g}) \rightleftharpoons \frac{1}{2}\text{H}_2(\text{g}) + \frac{1}{2}\text{I}_2(\text{g})$ at same temperature?
- (1) 49
 - (2) 0.005
 - (3) 0.143
 - (4) 14.3
7. The unit of K_p in the following reaction is:
 $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$
- (1) atm
 - (2) atm^{-2}
 - (3) atm^2
 - (4) atm^{-1}
8. The equilibrium constant for equilibrium,
 $\text{SO}_2(\text{g}) + \frac{1}{2}\text{O}_2(\text{g}) \rightleftharpoons \text{SO}_3(\text{g})$ and
 $2\text{SO}_3(\text{g}) \rightleftharpoons 2\text{SO}_2(\text{g}) + \text{O}_2(\text{g})$ are K_1 and K_2 respectively.
Then:
- (1) $K_2 = K_1$
 - (2) $K_2 = K_1^2$
 - (3) $K_2 = 1/K_1$
 - (4) $K_2 = 1/K_1^2$
9. For the reactions,
 $\text{A} \rightleftharpoons \text{B}; K_c = 2$
 $\text{B} \rightleftharpoons \text{C}; K_c = 4$
 $\text{C} \rightleftharpoons \text{D}; K_c = 6$
 K_c for the reaction, $\text{A} \rightleftharpoons \text{D}$ is:
- (1) $(2 + 4 + 6)$
 - (2) $(2 \times 4)/6$
 - (3) $(4 \times 6)/2$
 - (4) $2 \times 4 \times 6$
10. The equilibrium constant for the reactions are:
 $\text{H}_3\text{PO}_4 \xrightleftharpoons{K_1} \text{H}^+ + \text{H}_2\text{PO}_4^-; K_1$
 $\text{H}_2\text{PO}_4^- \xrightleftharpoons{K_2} \text{H}^+ + \text{HPO}_4^{2-}; K_2$
 $\text{HPO}_4^{2-} \xrightleftharpoons{K_3} \text{H}^+ + \text{PO}_4^{3-}; K_3$
The equilibrium constant for $\text{H}_3\text{PO}_4 \rightleftharpoons 3\text{H}^+ + \text{PO}_4^{3-}$ will be:
- (1) $K_1/K_2 K_3$
 - (2) $K_1 \times K_2 \times K_3$
 - (3) $K_2/K_1 K_3$
 - (4) $K_1 + K_2 + K_3$

11. The equilibrium constant for the reactions,
 $N_{2(g)} + O_{2(g)} \rightleftharpoons 2NO_{(g)}$,
 $NO_{(g)} + \frac{1}{2} O_{2(g)} \rightleftharpoons NO_{2(g)}$ are K_1 and K_2 respectively.
 Then the equilibrium constant for the equilibrium
 $N_{2(g)} + 2O_{2(g)} \rightleftharpoons 2NO_{2(g)}$ is:
 (1) K_1/K_2 (2) $K_1 K_2$
 (3) $K_1 K_2^2$ (4) $K_1^2 K_2$
12. For the following three reactions 1, 2 and 3, equilibrium constants are given:
 (1) $CO_{(g)} + H_2O_{(g)} \rightleftharpoons CO_{2(g)} + H_{2(g)}$; K_1
 (2) $CH_{4(g)} + H_2O_{(g)} \rightleftharpoons CO_{(g)} + 3H_{2(g)}$; K_2
 (3) $CH_{4(g)} + 2H_2O_{(g)} \rightleftharpoons CO_{2(g)} + 4H_{2(g)}$; K_3
 Which of the following relations is correct?
 (1) $K_1\sqrt{K_2} = K_3$ (2) $K_2 K_3 = K_1$
 (3) $K_3 = K_1 K_2$ (4) $K_3 \cdot K_2^3 K_1^2$
13. The equilibrium constant for the given reaction,
 $SO_{3(g)} \rightleftharpoons SO_{2(g)} + 1/2O_{2(g)}$; $K_c = 4.9 \times 10^{-2}$
 The value of K'_c for the reaction,
 $2SO_{2(g)} + O_{2(g)} \rightleftharpoons 2SO_{3(g)}$, will be:
 (1) 416 (2) 2.40×10^{-3}
 (3) 9.8×10^{-2} (4) 4.9×10^{-2}
14. Unit of equilibrium constant for the reversible reaction $H_2 + I_2 \rightleftharpoons 2HI$ is:
 (1) $\text{mol}^{-1} \text{ litre}$ (2) $\text{mol}^{-2} \text{ litre}$
 (3) mol litre^{-1} (4) None of these
15. For the reaction $2SO_2 + O_2 \rightleftharpoons 2SO_3$, the units of K_c are:
 (1) litre/mole (2) mol/litre
 (3) $(\text{mol litre}^{-1})^2$ (4) $(\text{litre mole}^{-1})^2$
16. Equilibrium constant K_1 and K_2 for the following equilibria:
 $NO_{(g)} + \frac{1}{2} O_2 \rightleftharpoons NO_{2(g)}$
 and $2NO_{2(g)} \rightleftharpoons 2NO_{(g)} + O_{2(g)}$ are related as:
 (1) $K_2 = 1/K_1$ (2) $K_2 = K_1^2$
 (3) $K_2 = K_1/2$ (4) $K_2 = 1/K_1^2$
17. The gaseous equilibria
 $SO_2(g) + \frac{1}{2} O_2(g) \rightleftharpoons SO_3(g)$ and
 $2SO_3 \rightleftharpoons 2SO_2(g) + O_2(g)$
 have equilibrium constants K_1 and K_2 respectively at 298 K. Which of the following relationships between K_1 and K_2 is correct?
 (1) $K_1 = K_2$ (2) $K_2 = K_1^2$
 (3) $K_2 = 1/K_1^2$ (4) $K_2 = 1/K_1$
18. At a given temperature, the equilibrium constant for reaction $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$ is 2.4×10^{-3} .
 At the same temperature, the equilibrium constant for the reaction, $PCl_3(g) + Cl_2(g) \rightleftharpoons PCl_5(g)$ is:
 (1) 2.4×10^{-3} (2) -2.4×10^{-3}
 (3) 4.2×10^2 (4) 4.8×10^{-2}
19. The equilibrium constant (K_c) for the reaction
 $2HCl(g) \rightleftharpoons H_2(g) + Cl_2(g)$ is 4×10^{-34} at 25°C .
 What is the equilibrium constant for the reaction?
 $\frac{1}{2} H_2(g) + \frac{1}{2} Cl_2(g) \rightleftharpoons HCl(g)$
 (1) 2×10^{-17}
 (2) 2.5×10^{33}
 (3) 5×10^{16}
 (4) None of these
20. What is the equilibrium expression for the reaction
 $P_4(s) + 5O_2(g) \rightleftharpoons P_4O_{10}(s)$?
 (1) $K_c = \frac{[P_4O_{10}]}{[P_4][O_2]^5}$
 (2) $K_c = \frac{1}{[O_2]^5}$
 (3) $K_c = [O_2]^5$
 (4) $K_c = \frac{[P_4O_{10}]}{5[P_4][O_2]}$



Note: Kindly find the Video Solution of DPPs Questions in the DPPs Section.

Answer Key

1. (4)
2. (4)
3. (3)
4. (2)
5. (3)
6. (3)
7. (2)
8. (4)
9. (4)
10. (2)

11. (3)
12. (3)
13. (1)
14. (4)
15. (1)
16. (4)
17. (3)
18. (3)
19. (3)
20. (2)



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