Arjuna NEET (2024)

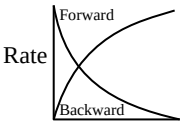
Chemical equilibrium

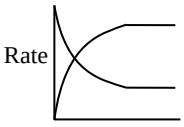
DPP-01

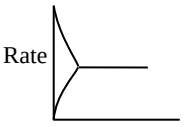
1. The active mass of 64 gm of HI in a two litre flask would be:
(1) 2 (2) 1
(3) 5 (4) 0.25

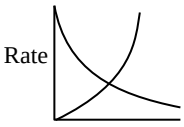
2. A chemical reaction is at equilibrium when:
(1) Equal amounts of reactants and products are present
(2) Formation of products is minimized
(3) Reactants are completely transformed into products
(4) Rates of forward and backward reactions are equal

3. For the system $3A + 2B \rightleftharpoons C$, the expression for equilibrium constant is:
(1) $\frac{[3A][2B]}{[C]}$ (2) $\frac{[C]}{[3A][2B]}$
(3) $\frac{[A]^3[B]^2}{[C]}$ (4) $\frac{[C]}{[A]^3[B]^2}$

4. Which of the following graph correctly represents a relation between rate of reaction w.r.t. time?
(1) 

(2) 

(3) 

(4) 

5. For a reversible reaction, the rate constant for forward and backward reactions are 2.38×10^{-4} and 8.15×10^{-5} respectively. The equilibrium constant for the reaction is:
(1) 0.342
(2) 2.92
(3) 0.292
(4) 3.42

6. In the reversible reaction
$2HI(g) \rightleftharpoons H_2(g) + I_2(g)$, K_p is:
(1) Greater than K_C (2) Less than K_C
(3) Equal to K_C (4) Zero

7. For the reaction $CO(g) + Cl_2(g) \rightleftharpoons COCl_2(g)$, the $\frac{K_p}{K_c}$ is equal to:
(1) $\frac{1}{RT}$ (2) RT
(3) $\sqrt{RT}$ (4) 1

8. For the reaction $A + B \rightleftharpoons 2C$, at the equilibrium concentration of A and B each is 0.20 mole/litre concentration C is observed as 0.60 mol/litre. Equilibrium constant (K_c) will be:
(1) 9 (2) 18
(3) 6 (4) 24

9. The equilibrium constant of a reaction is 20.0. At equilibrium, the rate constant of forward reaction is 10.0. The rate constant for backward reaction is:
(1) 0.5 (2) 2.0
(3) 10.0 (4) 200.0

10. Which reaction has $\Delta n_g = 2$?
(1) $CaCO_{3(s)} \rightleftharpoons CaO_{(s)} + CO_{2(g)}$
(2) $3Fe_{(s)} + 4H_2O_{(g)} \rightleftharpoons Fe_3O_{4(s)} + 4H_{2(g)}$
(3) $NH_4Cl_{(g)} \rightleftharpoons NH_{3(g)} + HCl_{(g)}$
(4) $CuSO_4 . 5H_2O_{(s)} \rightleftharpoons CuSO_4 . 3H_2O_{(s)} + 2H_2O_{(g)}$

11. For which reaction K_p is less than K_c?
(1) $N_2O_4 \rightleftharpoons 2NO_2$
(2) $2HI \rightleftharpoons H_2 + I_2$
(3) $2SO_2 + O_2 \rightleftharpoons 2SO_3$
(4) $N_2 + O_2 \rightleftharpoons 2NO$

12. K_p/K_c for the reaction, $CO_{(g)} + \frac{1}{2} O_{2(g)} \rightleftharpoons CO_{2(g)}$ is:
(1) RT (2) $1/\sqrt{RT}$
(3) $\sqrt{RT}$ (4) 1

13. Equilibrium is established in the reaction,
$A_{(aq.)} + B_{(aq.)} \rightleftharpoons 2C_{(aq.)}$
If equilibrium concentration are [A] = 0.25, [B] = 0.4 and [C] = 0.5 mol dm^{-3}. The value of K_c is:
(1) 0.25 (2) 0.4
(3) 2.5 (4) 4.0

14. Equilibrium concentration of HI, I_2 and H_2 is 0.7, 0.1 and 0.1 M respectively. The equilibrium constant for the reaction,
$I_{2(g)} + H_{2(g)} \rightleftharpoons 2HI_{(g)}$ is:
(1) 0.36 (2) 36
(3) 49 (4) 0.49

15. The equilibrium concentrations of X, Y and YX_2 are 4, 2 and 2 respectively for the equilibrium,
$2X + Y \rightleftharpoons YX_2$. The equilibrium constant K_c is:
(1) 0.0625 (2) 0.625
(3) 6.25 (4) None of these

16. For the reaction equilibrium;
$N_2O_{4(g)} \rightleftharpoons 2NO_{2(g)}$; the concentration of N_2O_4 and NO_2 at equilibrium are 4.8×10^{-2} and 1.2×10^{-2} mol/L respectively. The value of K_c for the reaction is:
(1) 3×10^{-3} M (2) 3×10^{3} M
(3) 3.3×10^{2} M (4) 3×10^{-1} M

17. For the reaction,
$SO_{2(g)} + \frac{1}{2} O_{2(g)} \rightleftharpoons SO_{3(g)}$, if $K_P = K_C(RT)^x$
where the symbols have usual meaning then the value of x is:
(1) –1 (2) $-\frac{1}{2}$
(3) $\frac{1}{2}$ (4) 1

18. The value of equilibrium constant for a reaction depends on:
(1) Temperature
(2) Pressure
(3) Volume
(4) Catalytic agent

19. According to law of mass action rate of a chemical reaction is proportional to:
(1) Concentration of reactants
(2) Molar concentration of reactants
(3) Concentration of products
(4) Molar concentration of products

20. The rate constant for forward and backward reactions of hydrolysis of ester are 1.1×10^{-2} and 1.5×10^{-3} per minute respectively. Equilibrium constant for the reaction is:
$CH_3COOC_2H_5 + H_2O \rightleftharpoons CH_3COOH + C_2H_5OH$
(1) 4.33 (2) 5.33
(3) 6.33 (4) 7.33

21. On a given condition, the equilibrium concentration of HI, H_2 and I_2 are 0.80, 0.10 and 0.10 mole/litre. The equilibrium constant for the reaction $H_2 + I_2 \rightleftharpoons 2HI$ will be:
(1) 64 (2) 12
(3) 8 (4) 0.8

22. For the system $A(g) + 2B(g) \rightleftharpoons C(g)$, the equilibrium concentrations are
(A) 0.06 mole/litre
(B) 0.12 mole/litre
(C) 0.216 mole/litre.
The K_{eq} for the reaction is:
(1) 250 (2) 4l6
(3) 4×10^{-3} (4) 125

23. For the reaction $A + 2B \rightleftharpoons C$, the expression for equilibrium constant is:
(1) $\frac{[A][B]^2}{[C]}$ (2) $\frac{[A][B]}{[C]}$
(3) $\frac{[C]}{[A][B]^2}$ (4) $\frac{[C]}{2[A][B]}$

24. In a reaction $A + B \rightleftharpoons C + D$, the concentrations of A, B, C and D (in moles/litre) are 0.5, 0.8, 0.4 and 1.0 respectively. The equilibrium constant is:
(1) 0.1 (2) 1.0
(3) 10 (4) ∞

25. The suitable expression for the equilibrium constant of the reaction $2NO(g) + Cl_2(g) \rightleftharpoons 2NOCl(g)$ is:

(1) $K_e = \frac{[2NOCl]}{[2NO][Cl_2]}$

(2) $K_e = \frac{[NOCl]^2}{[NO]^2[Cl_2]}$

(3) $K_e = \frac{[2NOCl]^2}{[NO][Cl_2]^2}$

(4) $K_e = \frac{[2NOCl]^2}{[NO]^2[Cl_2]^2}$

26. The equilibrium concentration of X, Y and YX_2 are 4, 2 and 2 moles respectively for the equilibrium $2X + Y \rightleftharpoons YX_2$. The value of K_e is:

(1) 0.625 (2) 0.0625

(3) 6.25 (4) 0.00625

27. An equilibrium mixture of the reaction $2H_2S(g) \rightleftharpoons 2H_2(g) + S_2(g)$ had 0.5 mole H_2S, 0.10 mole H_2 and 0.4 mole S_2 in one litre vessel. The value of equilibrium constant (K) in mole litre^{-1} is:

(1) 0.004 (2) 0.008

(3) 0.016 (4) 0.160

28. For the reaction $N_2O_4 \rightleftharpoons 2NO_{2(g)}$, the concentrations of N_2O_4 and NO_2 at equilibrium are 4.8×10^{-2} and 1.2×10^{-2} mol litre^{-1} respectively. The value of K_e for the reaction is:

(1) 3.3×10^2 mol litre^{-1}

(2) 3×10^1 mol litre^{-1}

(3) 3×10^{-3} mol litre^{-1}

(4) 3×10^3 mol litre^{-1}

29. In which of the following equilibria, the value of K_p is less than K_c:

(1) $H_2 + I_2 \rightleftharpoons 2HI$

(2) $N_2 + 3H_2 \rightleftharpoons 2NH_3$

(3) $N_2 + O_2 \rightleftharpoons 2NO$

(4) $CO + H_2O \rightleftharpoons CO_2 + H_2$

30. 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}

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

Answer Key

1.	(4)	16.	(1)
2.	(4)	17.	(2)
3.	(4)	18.	(1)
4.	(3)	19.	(2)
5.	(2)	20.	(4)
6.	(3)	21.	(1)
7.	(1)	22.	(1)
8.	(1)	23.	(3)
9.	(1)	24.	(2)
10.	(4)	25.	(2)
11.	(3)	26.	(2)
12.	(2)	27.	(3)
13.	(3)	28.	(3)
14.	(3)	29.	(2)
15.	(1)	30.	(3)

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