

CHEMISTRY

BOOKS - NTA MOCK TESTS

EQUILIBRIUM TEST (CHEMICAL)-1

Multiple Choice Question

1. Bromine monochloride (BrCl) decomposes into bromine and chlorine according to reaction

$2BrCl(g) = Br_2(g) + Cl_2(g)$, $K_c = 32$ at 500 K. If initially,

pure BrCl is taken at concentration $3.3 \times 10^{-3} \text{ mol L}^{-1}$, what is

its molar concentration in the mixture at equilibrium state?

A. $1.23 \times 10^{-2} \text{ mol L}^{-1}$

B. $2.8 \times 10^{-4} M$

C. $3.54 \times 10^{-3} \text{mol L}^{-1}$

D. $4.76 \times 10^{-1} \text{mol L}^{-1}$

Answer: B



[View Text Solution](#)

2. The first ionization constant of H_2S is 9.1×10^{-8} . Calculate the concentration of HS^- ion in its 0.1 M solution. How will this concentration be affected, if the solution is 0.1 M in HCl also? If the second dissociation constant of H_2S is 1.2×10^{-13} , then calculate the concentration of S^{2-} under both conditions. Select these four answers from the choices given below.

| $[HS^-]$ | $[HS^-]$ 0.1 M HCl | $[S^{2-}]$ | $[S^{2-}]$ 0.1 M HCl |
|--------------------------|------------------------|-------------------------|---------------------------|
| 9.54×10^{-13} M | 9.1×10^{-8} M | 1.2×10^{-13} M | 1.092×10^{-13} M |

A.

| $[HS^-]$ | $[HS^-]$ 0.1 M HCl | $[S^{2-}]$ | $[S^{2-}]$ 0.1 M HCl |
|-------------------------|-------------------------|---------------------------|-------------------------|
| 9.10×10^{-8} M | 9.54×10^{-5} M | 1.092×10^{-19} M | 3.38×10^{-9} M |

B.

| $[HS^-]$ | $[HS^-]$ 0.1 M HCl | $[S^{2-}]$ | $[S^{2-}]$ 0.1 M HCl |
|---------------------------|-------------------------|------------------------|-------------------------|
| 1.092×10^{-19} M | 3.38×10^{-9} M | 9.1×10^{-8} M | 9.54×10^{-5} M |

C.

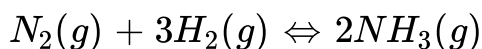
D. None of these

Answer: A

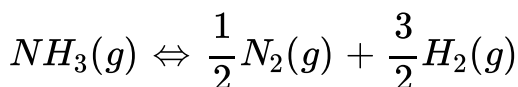


View Text Solution

3. One mole of N_2 (g) is mixed with 2 moles of H_2 (g) in a 4 litre vessel. If 50% of N_2 (g) is converted to NH_3 (g) by the following reaction:



What will be the value of K_c for the following equilibrium ?



A. 256

B. 16

C. $\frac{1}{16}$

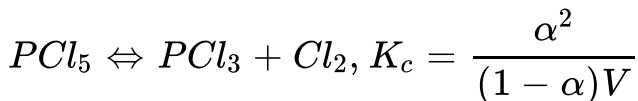
D. None of these

Answer: C



[View Text Solution](#)

4. For the equilibrium,



temperature remaining constant.

A. K_c may increase or decrease with the change in volume

depending upon its numerical value

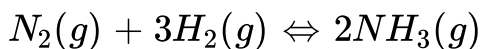
- B. K_c will increase with the increase in volume
- C. K_c will increase with the decrease in volume
- D. K_c will not change with the change in volume

Answer: D



View Text Solution

5. Which of the following is correct for the reaction?



A. $K_p = K_c$

B. $K_p < K_c$

C. $K_p > K_c$

D. Pressure is required to predict the correlation

Answer: B



[View Text Solution](#)

6. In the reaction, $H_2(g) + Cl_2(g) \rightleftharpoons 2HCl(g)$:

A. $K_p \neq K_c$

B. $K_p = K_c$

C. $K_p > K_c$

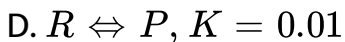
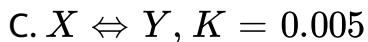
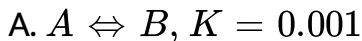
D. $K_p < K_c$

Answer: B



[View Text Solution](#)

7. In which of the following reactions, the concentration of product is higher than the concentration of reactant at equilibrium? (K = equilibrium constant)



Answer: B



[View Text Solution](#)

8. The equilibrium constant K_c for the reaction $P_4(g) \rightleftharpoons 2P_2(g)$ is 1.4 at $400^\circ C$. Suppose that 3 moles of P_4

(g) and 2 moles of P_2 (g) are mixed in 2 litre container at $400^\circ C$

. What is the value of reaction quotient (Q)?

A. $3/2$

B. $2/3$

C. 1

D. None of these

Answer: B



[View Text Solution](#)

9. The equilibrium constant of the reaction $A_2(g) + B_2(g) \rightleftharpoons 2AB(g)$ at 373 K is 50. If 1 L of flask containing 1 mole of A_2 (g) is connected to 2 L flask containing

2 moles B_2 (g) at $100^\circ C$, the amount of AB produced at equilibrium at $100^\circ C$ would be

A. 0.93 mol

B. 1.87 mol

C. 2.80 mol

D. 3.74 mol

Answer: B



[View Text Solution](#)

10. The equilibrium, $SO_2Cl_2(g) \rightleftharpoons SO_2(g) + Cl_2(g)$ is attained at 298 K in a closed container and an inert gas, He is introduced. Which of the following is/are correct?

- A. Concentration of $SO_2(g)$, $Cl_2(g)$ and $SO_2Cl_2(g)$ remain unchanged
- B. More $Cl_2(g)$ is formed
- C. Concentration of $SO_2(g)$ is reduced
- D. More $SO_2Cl_2(g)$ is formed

Answer: A



[View Text Solution](#)

11. The reaction quotient (Q) predicts:

- A. The direction of equilibrium to be attained.
- B. The ratio of activities at equilibrium i.e., K_c .
- C. The ratio of activities at any time.

D. All of these

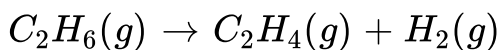
Answer: D



[View Text Solution](#)

12. $K_p = 0.04$ atm at 899 K for the equilibrium shown below.

What is the equilibrium concentration of C_2H_6 when it is placed in a flask at 4.0 atm pressure and allowed to come to equilibrium?



A. 7.24 atm

B. 3.62 atm

C. 1 atm

D. 1.5 atm

Answer: B



[View Text Solution](#)

13. The equilibrium constant K_c for $A(g) \rightleftharpoons B(g)$ is 1.1, gas B will have a molar concentration greater than 1 if:

A. $[A] = 0.91$

B. $[A] > 0.91$

C. $[A] > 1$

D. All of these

Answer: D



[View Text Solution](#)

14. $X_2 + X^- \rightleftharpoons X_3^-$ (x = iodine) This reaction is set up in aqueous medium. We start with 1 mol of X_2 and 0.5 mol of X^- in 1L flask. After equilibrium is reached, excess of $AgNO_3$ gave 0.25 mol of yellow ppt. equilibrium constant is

A. 1.33

B. 2.66

C. 2.00

D. 3.00

Answer: A



[View Text Solution](#)

15. The partial pressure of $CH_3OH(g)$, $CO_{(g)}$ and $H_{2(g)}$ in equilibrium mixture for the reaction,

$CO_{(g)} + 2H_{2(g)} \rightleftharpoons CH_3OH$ are 2.0, 1.0 and 0.1 atm respectively at $427^\circ C$. The value of K_p for decomposition of CH_3OH to CO and H_2 is:

A. 10^2atm^2

B. $2 \times 10^2 \text{atm}^{-2}$

C. 50atm^2

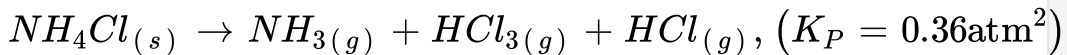
D. $5 \times 10^{-3} \text{atm}^2$

Answer: D



[View Text Solution](#)

16. 0.2 mole of NH_4Cl are introduced into an empty container of 10 litre and heated to $327^\circ C$ to attain equilibrium as :



The quantity of solid NH_4Cl left is:

A. 0.078 mole

B. 0.02 mole

C. 0.095 mole

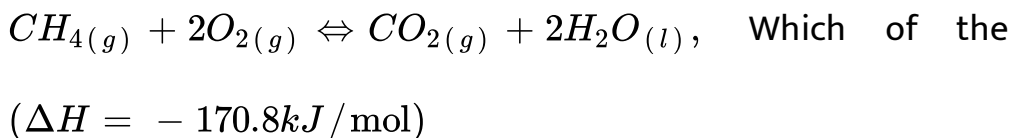
D. 0.035 mole

Answer: A



[View Text Solution](#)

17. For the reaction :



following statements is not true?

A. Addition of $CH_4(g)$ or $O_2(g)$ at equilibrium will cause a shift to right

B. The reaction is exothermic

C. At equilibrium, the concentration of $CO_2(g)$ and $H_2O(l)$ are not equal

D. The equilibrium constant for the reaction is given by

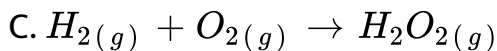
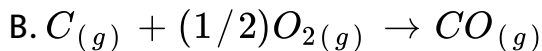
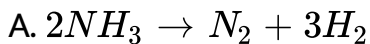
$$K_p = \frac{[CO_2]}{[CH_4][O_2]^2}$$

Answer: D



[View Text Solution](#)

18. In which of the following reactions, increase in the volume at constant temperature does not affect the number of moles at equilibrium ?



D. None of these

Answer: D



[View Text Solution](#)

19. For the reversible reaction,

$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$ at $500^\circ C$, the value of K_p is

1.44×10^{-5} when partial pressure is measured in atmosphere.

The corresponding value of K_c , with concentration in mole litre

$^{-1}$, is -

A. $\frac{1.44 \times 10^{-5}}{(0.082 \times 500)^{-2}}$

- B. $\frac{1.44 \times 10^{-5}}{(8.314 \times 773)^{-2}}$
- C. $\frac{1.44 \times 10^{-5}}{(8.314 \times 500)^{-2}}$
- D. $\frac{1.44 \times 10^{-5}}{(0.082 \times 773)^{-2}}$

Answer: D



[View Text Solution](#)

20. At constant temperature, the equilibrium constant (K_p) for the decomposition reaction $N_2O_4(g) \rightleftharpoons 2NO_2(g)$ is expressed by $K_p = \frac{4x^2}{1-x^2}P$, where P = pressure, x = extent of decomposition. Which one of the following statements is true?

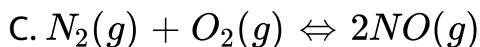
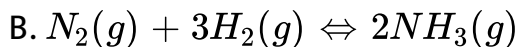
- A. K_p remains constant with change in P and x
- B. K_p increases with increase of P
- C. K_p increases with decrease of x .

D. K_p increases with increase of x.

Answer: A

 [View Text Solution](#)

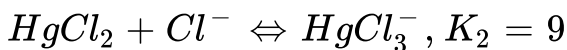
21. In which of the following equilibrium, change in the volume of the system does not alter the number of moles -



Answer: C

 [View Text Solution](#)

22. The equilibrium constant for the disproportionation of $HgCl^+$ and $HgCl_3^-$ is



A. 27×10^6

B. 3.3×10^{-7}

C. 3.3×10^{-6}

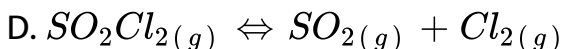
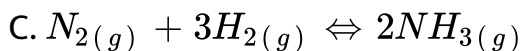
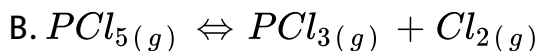
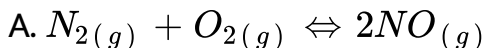
D. 3×10^{-6}

Answer: D



View Text Solution

23. Change in volume of the system does not alter the number of moles in which of the following equilibrium?

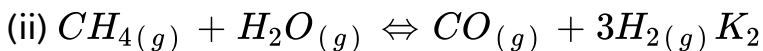
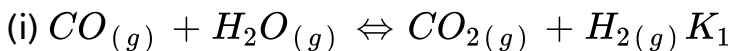


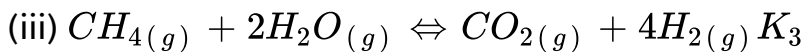
Answer: A



View Text Solution

24. For the following three reaction (i), (ii) and (iii) equilibrium constants are given





Which of the following relation is correct ?

A. $K_3 \cdot K_2^3 = K_1^2$

B. $K_2 \cdot K_3 = K_1$

C. $K_1 \sqrt{K_2} = K_3$

D. $K_3 = K_1 K_2$

Answer: D



[View Text Solution](#)

25. The pK_a of a weak acid, HA, is 4.80. The pK_b of a weak base, BOH is 4.78. The pH of an aqueous solution of the corresponding salt, BA, will be

A. 9.22

B. 9.58

C. 4.79

D. 7.01

Answer: D



[View Text Solution](#)

26. Which of the following buffer solutions turns invalid on addition of 10 mL of 1.0 M HCl?

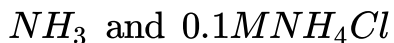
A. 100 mL of buffer solution having 0.15 M

NH_3 and NH_4Cl each

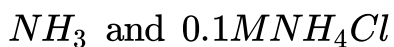
B. 100 mL of buffer solution having 0.2 M NH_3 and NH_4Cl

each

C. 100 mL of buffer solution having 0.2 M



D. 100 mL of buffer solution having 0.5 M

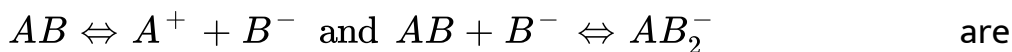


Answer: D



[View Text Solution](#)

27. The two equilibrium,



simultaneously maintained in a solution with equilibrium

constants, K_1 and K_2 respectively. The ratio of A^+ to AB_2^- in

the solution is

A. Directly proportional to the concentration of B^-

B. Inversely proportional to the concentration of B^-

C. Inversely proportional to the square of the concentration
of B^-

D. Directly proportional to the square of the concentration
of B^-

Answer: C



[View Text Solution](#)

28. An equilibrium mixture at 300 K has N_2O_4 and NO_2 at 0.28 atm and 1.10 atm pressures. If the volume of container doubled at same temperature. Calculate the new equilibrium pressures for the gases.

A. 0.095, 0.64 atm

B. 1.095, 2.64 atm

C. 1.250, 2.30 atm

D. 3.250, 1.50 atm

Answer: A



View Text Solution

29. The Henderson's equation for acetic acid and sodium acetate buffer is given by the expression.

A. $pH = pK_a - \log \frac{[CH_3COONa]}{[CH_3COOH]}$

B. $pH = pK_a + \log \frac{[CH_3COONa]}{[CH_3COOH]}$

C. $pOH = pK_a - \log \frac{[CH_3COONa]}{[CH_3COOH]}$

D. $pOH = pK_a - \log \frac{[CH_3COOH]}{[CH_3COONa]}$

Answer: B



[View Text Solution](#)

30. An amount of solid NH_4HS is placed in a flask already containing ammonia gas at a certain temperature and 0.50 atm. pressure. Ammonium hydrogen sulphide decomposes to yield NH_3 and H_2S gases in the flask. When the decomposition reaction reaches equilibrium, the total pressure in the flask rises to 0.84 atm. The equilibrium constant for NH_4HS decomposition at this temperature is

A. 0.30atm^2

B. 0.18atm^2

C. 0.17atm^2

D. 0.11atm^2

Answer: D



View Text Solution

Single Choice

1. Bromine monochloride (BrCl) decomposes into bromine and chlorine according to reaction

$2BrCl(g) = Br_2(g) + Cl_2(g)$, $K_c = 32$ at 500 K. If initially,

pure BrCl is taken at concentration $3.3 \times 10^{-3} \text{ mol L}^{-1}$, what is

its molar concentration in the mixture at equilibrium state?

A. $1.23 \times 10^{-2} \text{ mol L}^{-1}$

B. $2.8 \times 10^{-4} M$

C. $3.54 \times 10^{-3} \text{ mol L}^{-1}$

D. $4.76 \times 10^{-1} \text{ mol L}^{-1}$

Answer: B

 View Text Solution

2. The first ionization constant of H_2S is 9.1×10^{-8} . Calculate the concentration of HS^- ion in its 0.1 M solution. How will this concentration be affected, if the solution is 0.1 M in HCl also? If the second dissociation constant of H_2S is 1.2×10^{-13} , then calculate the concentration of S^{2-} under both conditions. Select these four answers from the choices given below.

A.

| $[HS^-]$ | $[HS^-]$ 0.1 M HCl | $[S^{2-}]$ | $[S^{2-}]$ 0.1 M HCl |
|--------------------|----------------------|-----------------------|----------------------|
| 9.54 | 9.1×10^{-8} | 1.2×10^{-13} | 1.092 |
| $\times 10^{-3}$ M | M | M | $\times 10^{-12}$ M |

B.

| $[HS^-]$ | $[HS^-]$ 0.1 M HCl | $[S^{2-}]$ | $[S^{2-}]$ 0.1 M HCl |
|-----------------------|--------------------|---------------------|----------------------|
| 9.10×10^{-8} | 9.54 | 1.092 | 3.38 |
| M | $\times 10^{-8}$ M | $\times 10^{-12}$ M | $\times 10^{-8}$ M |

C.

| $[HS^-]$ | $[HS^-]$ 0.1 M HCl | $[S^{2-}]$ | $[S^{2-}]$ 0.1 M HCl |
|---------------------|--------------------|--------------------|-----------------------|
| 1.092 | 3.38 | 9.1 | 9.54×10^{-3} |
| $\times 10^{-12}$ M | $\times 10^{-8}$ M | $\times 10^{-8}$ M | M |

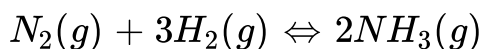
D. None of these

Answer: A

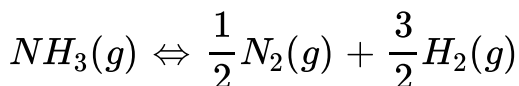


View Text Solution

3. One mole of N_2 (g) is mixed with 2 moles of H_2 (g) in a 4 litre vessel. If 50% of N_2 (g) is converted to NH_3 (g) by the following reaction:



What will be the value of K_c for the following equilibrium ?



A. 256

B. 16

C. $\frac{1}{16}$

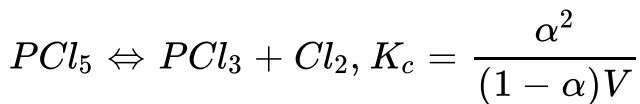
D. None of these

Answer: C



[View Text Solution](#)

4. For the equilibrium,



temperature remaining constant.

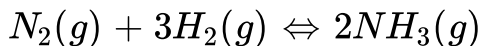
- A. K_c may increase or decrease with the change in volume depending upon its numerical value
- B. K_c will increase with the increase in volume
- C. K_c will increase with the decrease in volume
- D. K_c will not change with the change in volume

Answer: D



[View Text Solution](#)

5. Which of the following is correct for the reaction?



A. $K_p = K_c$

B. $K_p < K_c$

C. $K_p > K_c$

D. Pressure is required to predict the correlation

Answer: B



[View Text Solution](#)

6. In the reaction, $H_2(g) + Cl_2(g) \rightleftharpoons 2HCl(g)$:

A. $K_p \neq K_c$

B. $K_p = K_c$

C. $K_p > K_c$

D. $K_p < K_c$

Answer: B



[View Text Solution](#)

7. In which of the following reactions, the concentration of product is higher than the concentration of reactant at equilibrium? (K = equilibrium constant)

A. $A \rightleftharpoons B, K = 0.001$

B. $M \rightleftharpoons N, K = 10$

C. $X \rightleftharpoons Y, K = 0.005$

$$D. R \rightleftharpoons P, K = 0.01$$

Answer: B



View Text Solution

8. The equilibrium constant K_c for the reaction $P_4(g) \rightleftharpoons 2P_2(g)$ is 1.4 at $400^\circ C$. Suppose that 3 moles of P_4 (g) and 2 moles of P_2 (g) are mixed in 2 litre container at $400^\circ C$. What is the value of reaction quotient (Q)?

A. $3/2$

B. $2/3$

C. 1

D. None of these

Answer: B



[View Text Solution](#)

9. The equilibrium constant of the reaction $A_2(g) + B_2(g) \rightleftharpoons 2AB(g)$ at 373 K is 50. If 1 L of flask containing 1 mole of $A_2(g)$ is connected to 2 L flask containing 2 moles $B_2(g)$ at $100^\circ C$, the amount of AB produced at equilibrium at $100^\circ C$ would be

A. 0.93 mol

B. 1.87 mol

C. 2.80 mol

D. 3.74 mol

Answer: B



[View Text Solution](#)

10. The equilibrium, $SO_2Cl_2(g) \rightleftharpoons SO_2(g) + Cl_2(g)$ is attained at 298 K in a closed container and an inert gas, He is introduced. Which of the following is/are correct?

- A. Concentration of $SO_2(g)$, $Cl_2(g)$ and $SO_2Cl_2(g)$ remain unchanged
- B. More $Cl_2(g)$ is formed
- C. Concentration of $SO_2(g)$ is reduced
- D. More $SO_2Cl_2(g)$ is formed

Answer: A



[View Text Solution](#)

11. The reaction quotient (Q) predicts:

- A. The direction of equilibrium to be attained.
- B. The ratio of activities at equilibrium i.e., K_c .
- C. The ratio of activities at any time.
- D. All of these

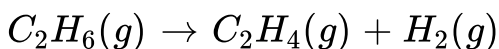
Answer: D



[View Text Solution](#)

12. $K_p = 0.04$ atm at 899 K for the equilibrium shown below.

What is the equilibrium concentration of C_2H_6 when it is placed in a flask at 4.0 atm pressure and allowed to come to equilibrium?



A. 7.24 atm

B. 3.62 atm

C. 1 atm

D. 1.5 atm

Answer: B



[View Text Solution](#)

13. The equilibrium constant K_c for $A(g) \rightleftharpoons B(g)$ is 1.1, gas B will have a molar concentration greater than 1 if:

A. $[A] = 0.91$

B. $[A] > 0.91$

C. $[A] > 1$

D. All of these

Answer: D



View Text Solution

14. $X_2 + X^- \rightleftharpoons X_3^-$ (x = iodine) This reaction is set up in aqueous medium. We start with 1 mol of X_2 and 0.5 mol of X^- in 1L flask. After equilibrium is reached, excess of $AgNO_3$ gave 0.25 mol of yellow ppt. equilibrium constant is

A. 1.33

B. 2.66

C. 2.00

D. 3.00

Answer: A



View Text Solution

15. The partial pressure of $CH_3OH(g)$, $CO_{(g)}$ and $H_{2(g)}$ in equilibrium mixture for the reaction,

$CO_{(g)} + 2H_{2(g)} \rightleftharpoons CH_3OH$ are 2.0, 1.0 and 0.1 atm respectively at $427^\circ C$. The value of K_p for decomposition of CH_3OH to CO and H_2 is:

A. 10^2atm^2

B. $2 \times 10^2 \text{atm}^{-2}$

C. 50atm^2

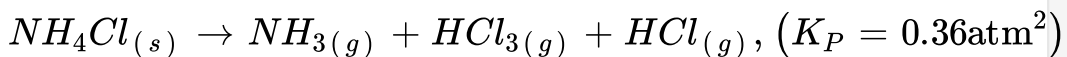
D. $5 \times 10^{-3} \text{atm}^2$

Answer: D



[View Text Solution](#)

16. 0.2 mole of NH_4Cl are introduced into an empty container of 10 litre and heated to 327°C to attain equilibrium as :



The quantity of solid NH_4Cl left is:

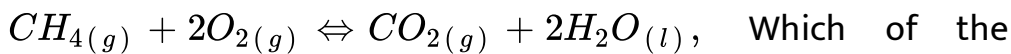
- A. 0.078 mole
- B. 0.02 mole
- C. 0.095 mole
- D. 0.035 mole

Answer: A



[View Text Solution](#)

17. For the reaction :



$(\Delta H = -170.8 \text{ kJ/mol})$

following statements is not true?

A. Addition of $CH_{4(g)}$ or $O_{2(g)}$ at equilibrium will cause a shift to right

B. The reaction is exothermic

C. At equilibrium, the concentration of $CO_{2(g)}$ and $H_2O_{(l)}$ are not equal

D. The equilibrium constant for the reaction is given by

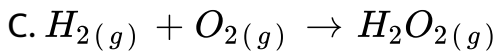
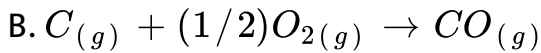
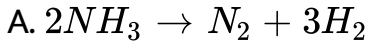
$$K_p = \frac{[CO_2]}{[CH_4][O_2]^2}$$

Answer: D



[View Text Solution](#)

18. In which of the following reactions, increase in the volume at constant temperature does not affect the number of moles at equilibrium ?



D. None of these

Answer: D



[View Text Solution](#)

19. For the reversible reaction,

$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$ at $500^\circ C$, the value of K_p is 1.44×10^{-5} when partial pressure is measured in atmosphere.

The corresponding value of K_c , with concentration in mole litre⁻¹, is -

A. $\frac{1.44 \times 10^{-5}}{(0.082 \times 500)^{-2}}$

B. $\frac{1.44 \times 10^{-5}}{(8.314 \times 773)^{-2}}$

C. $\frac{1.44 \times 10^{-5}}{(8.314 \times 500)^{-2}}$

D. $\frac{1.44 \times 10^{-5}}{(0.082 \times 773)^{-2}}$

Answer: D



[View Text Solution](#)

20. At constant temperature, the equilibrium constant (K_p) for the decomposition reaction $N_2O_4(g) \rightleftharpoons 2NO_2(g)$ is expressed by $K_p = \frac{4x^2}{1-x^2}P$, where P = pressure, x = extent of decomposition. Which one of the following statements is true?

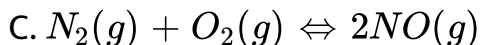
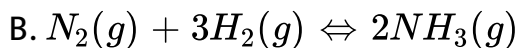
- A. K_p remains constant with change in P and x
- B. K_p increases with increase of P
- C. K_p increases with decrease of x.
- D. K_p increases with increase of x.

Answer: A



[View Text Solution](#)

21. In which of the following equilibrium, change in the volume of the system does not alter the number of moles -



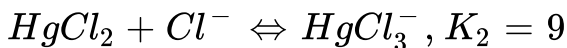


Answer: C



View Text Solution

22. The equilibrium constant for the disproportionation of $HgCl^+$ and $HgCl_3^-$ is



A. 27×10^6

B. 3.3×10^{-7}

C. 3.3×10^{-6}

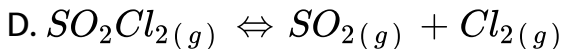
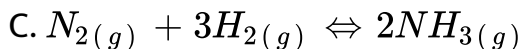
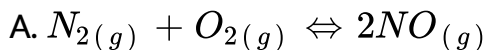
D. 3×10^{-6}

Answer: D



View Text Solution

23. Change in volume of the system does not alter the number of moles in which of the following equilibrium?

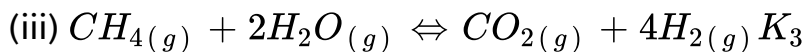
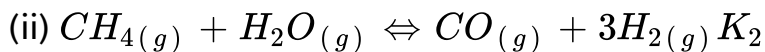
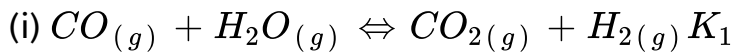


Answer: A



View Text Solution

24. For the following three reaction (i), (ii) and (iii) equilibrium constants are given



Which of the following relation is correct ?

A. $K_3 \cdot K_2^3 = K_1^2$

B. $K_2 \cdot K_3 = K_1$

C. $K_1 \sqrt{K_2} = K_3$

D. $K_3 = K_1 K_2$

Answer: D



View Text Solution

25. The pK_a of a weak acid, HA, is 4.80. The pK_b of a weak base, BOH is 4.78. The pH of an aqueous solution of the corresponding salt, BA, will be

A. 9.22

B. 9.58

C. 4.79

D. 7.01

Answer: D



[View Text Solution](#)

26. Which of the following buffer solutions turns invalid on addition of 10 mL of 1.0 M HCl?

A. 100 mL of buffer solution having 0.15 M

NH_3 and NH_4Cl each

B. 100 mL of buffer solution having 0.2 M NH_3 and NH_4Cl

each

C. 100 mL of buffer solution having 0.2 M

NH_3 and $0.1MNH_4Cl$

D. 100 mL of buffer solution having 0.5 M

NH_3 and $0.1MNH_4Cl$

Answer: D



[View Text Solution](#)

27. The two equilibrium,

$AB \rightleftharpoons A^+ + B^-$ and $AB + B^- \rightleftharpoons AB_2^-$ are

simultaneously maintained in a solution with equilibrium constants, K_1 and K_2 respectively. The ratio of A^+ to AB_2^- in the solution is

- A. Directly proportional to the concentration of B^-
- B. Inversely proportional to the concentration of B^-
- C. Inversely proportional to the square of the concentration of B^-
- D. Directly proportional to the square of the concentration of B^-

Answer: C



[View Text Solution](#)

28. An equilibrium mixture at 300 K has N_2O_4 and NO_2 at 0.28 atm and 1.10 atm pressures. If the volume of container doubled at same temperature. Calculate the new equilibrium pressures for the gases.

A. 0.095, 0.64 atm

B. 1.095, 2.64 atm

C. 1.250, 2.30 atm

D. 3.250, 1.50 atm

Answer: A



[View Text Solution](#)

29. The Henderson's equation for acetic acid and sodium acetate buffer is given by the expression.

$$\text{A. } pH = pK_a - \log \frac{[CH_3COONa]}{[CH_3COOH]}$$

$$\text{B. } pH = pK_a + \log \frac{[CH_3COONa]}{[CH_3COOH]}$$

$$\text{C. } pOH = pK_a - \log \frac{[CH_3COONa]}{[CH_3COOH]}$$

$$\text{D. } pOH = pK_a - \log \frac{[CH_3COOH]}{[CH_3COONa]}$$

Answer: B



[View Text Solution](#)

30. An amount of solid NH_4HS is placed in a flask already containing ammonia gas at a certain temperature and 0.50 atm. pressure . Ammonium hydrogen sulphide decomposes to yield NH_3 and H_2S gases in the flask. When the decomposition reaction reaches equilibrium , the total pressure in the flask rise to 0.84 atm . The equilibrium constant for $NH_4 HS$ decomposition at this temperature is

A. 0.30atm^2

B. 0.18atm^2

C. 0.17atm^2

D. 0.11atm^2

Answer: D



[View Text Solution](#)