Arjuna NEET (2024)

Chemical Equilibrium

DPP-04

1. $NH_4COONH_2(s) \rightleftharpoons 2NH_3(g) + CO_2(g)$.
If equilibrium pressure of gaseous mixture is 3 atm then K_p will be:
(1) 4 (2) 27
(3) $\frac{4}{27}$ (4) $\frac{1}{27}$

2. 15 moles of H_2 and 5.2 moles of I_2 are mixed and then allowed to attain equilibrium at 500°C. At equilibrium, the concentration of HI is found to be 10 moles. The equilibrium constant for the formation of HI is:
(1) 50 (2) 15
(3) 100 (4) 25

3. 2 moles of N_2 is mixed with 6 moles of H_2 in a closed vessel of 1 litre capacity. If 50% N_2 is converted into NH_3 at equilibrium, the value of K_c for the reaction is:
$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$
(1) $\frac{4}{27}$ (2) $\frac{27}{4}$
(3) $\frac{1}{27}$ (4) 27

4. Eight mole of a gas AB_3 attain equilibrium in a closed container of volume 1 dm^3 as,
$2AB_{3(g)} \rightleftharpoons A_{2(g)} + 3B_{2(g)}$. If at equilibrium 2 mole of A_2 are present, then equilibrium constant is:
(1) 72 $mol^2\ L^{-2}$ (2) 36 $mol^2\ L^{-2}$
(3) 3 $mol^2\ L^{-2}$ (4) 27 $mol^2\ L^{-2}$

5. In the reaction, $H_2 + I_2 \rightleftharpoons 2HI$. In a litre flask 0.4 moles of each H_2 and I_2 are taken. At equilibrium 0.5 moles of HI are formed. What will be the value of equilibrium constant, K_c
(1) 20.2 (2) 25.4
(3) 0.284 (4) 11.1

6. 4 moles of A are mixed with 4 moles of B. At equilibrium for the reaction $A + B \rightleftharpoons C + D$, 2 moles of each C and D are formed. The equilibrium constant for the reaction will be:
(1) $\frac{1}{4}$ (2) $\frac{1}{2}$
(3) 1 (4) 4

7. At a certain temperature in a 5 L vessel, 2 moles of carbon monoxide and 3 moles of chlorine were allowed to reach equilibrium according to the reaction, $CO + Cl_2 \rightleftharpoons COCl_2$. At equilibrium, if one mole of CO is present then equilibrium constant (K_c) for the reaction is:
(1) 2 (2) 2.5
(3) 3 (4) 4

8. For $NH_4HS_{(s)} \rightleftharpoons NH_{3(g)} + H_2S_{(g)}$, if $K_p = 64\ atm^2$, equilibrium pressure of mixture is:
(1) 8 atm (2) 16 atm
(3) 64 atm (4) 4 atm

9. 4.5 moles each of hydrogen and iodine are heated in a sealed ten litre vessel. At equilibrium, 3 moles of HI were found. The equilibrium constant for $H_{2(g)} + I_{2(g)} \rightleftharpoons 2HI_{(g)}$ is:
(1) 1 (2) 10
(3) 5 (4) 0.33

10. For the reaction,
$CH_3COOH(l) + C_2H_5OH(l) \rightleftharpoons CH_3COOC_2H_5(l) + H_2O\ (l)$,
1 mole each of acid and alcohol were taken initially. At equilibrium, how many moles of ester will be formed ($K_c = 4$)
(1) 1 mole (2) 2 mole
(3) $\frac{1}{3}$ mol (4) $\frac{2}{3}$ mole

11. The exothermic formation of ClF_3 is represented by the equation:
$Cl_{2(g)} + 3F_{2(g)} \rightleftharpoons 2ClF_{3(g)};\ \Delta H = -329$ kJ
Which of the following will increase the quantity of ClF_3 in an equilibrium mixture of Cl_2, F_2 and ClF_3?
(1) Increasing the temperature
(2) Removing Cl_2
(3) Increasing the volume of container
(4) Adding F_2

12. For the reaction,
$PCl_{5(g)} \rightleftharpoons PCl_{3(g)} + Cl_{2(g)}$
The forward reaction at constant temperature is favoured by:
(1) Introducing an inert gas at constant volume
(2) Introducing chlorine gas at constant volume
(3) Introducing an inert gas at constant pressure
(4) None of these

13. The reaction A + B ⇌ C + D + heat has reached equilibrium. The reaction may be made to proceed forward by:
(1) Adding more C
(2) Adding more D
(3) Decreasing the temperature
(4) Increasing the temperature

14. The formation of nitric oxide by contact process $N_2 + O_2 \rightleftharpoons 2NO$, $\Delta H = 43{,}200$ kcal is favoured by:
(1) Low temperature and low pressure
(2) Low temperature and high pressure
(3) High temperature and high pressure
(4) High temperature and excess reactants concentration

15. What happens when an inert gas is added to an equilibrium keeping volume unchanged:
(1) More reactant will form
(2) More product will form
(3) Equilibrium will remain unchanged
(4) Less product will form

16. For which of the following reaction is product formation favoured by low pressure and low temperature?
(1) $CO_2(g) + C(s) \leftrightharpoons 2CO(g)$; $\Delta H° = 172.5$ kJ
(2) $CO(g) + 2H_2(g) \leftrightharpoons CH_3OH$; $\Delta H° = -21.7$ kJ
(3) $2O_3(g) \leftrightharpoons 3O_2(g)$; $\Delta H° = -285$ kJ
(4) $H_2(g) + F_2(g) \leftrightharpoons 2HF(g)$; $\Delta H° = -541$ kJ

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

Answer Key

1.	**(1)**	**9.**	**(1)**
2.	**(1)**	**10.**	**(4)**
3.	**(1)**	**11.**	**(4)**
4.	**(4)**	**12.**	**(3)**
5.	**(4)**	**13.**	**(3)**
6.	**(3)**	**14.**	**(4)**
7.	**(2)**	**15.**	**(3)**
8.	**(2)**	**16.**	**(3)**

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