PHYSICAL CHEMISTRY

DPP

DAILY PRACTICE PROBLEMS

DPP No. 37

Total Marks : 24

Max. Time : 24 min.

Topic : Chemical Equilibrium

Type of Questions — **M.M., Min.**

Single choice Objective ('–1' negative marking) Q.1 to Q.8 — **(3 marks, 3 min.)** — **[24, 24]**

1. For the homogeneous gaseous reaction : $4NH_3 + 5O_2 \rightleftharpoons 4NO + 6H_2O$, the equilibrium constant K_c has the units of :

(A) $(Conc.)^{-10}$ (B) $(Conc.)^{1}$ (C) $(Conc.)^{-1}$ (D) It is dimensionless.

2. Select the gaseous reaction for which the equilibrium constant is written as : $[MX_3]^2 = K[MX_2]^2 [X_2]$

(A) $MX_3 \rightleftharpoons MX_2 + \frac{1}{2}X_2$ (B) $2MX_3 \rightleftharpoons 2MX_2 + X_2$

(C) $2MX_2 + X_2 \rightleftharpoons 2MX_3$ (D) $MX_2 + \frac{1}{2}X_2 \rightleftharpoons MX_3$.

3. In order to increase the rate of forward reaction : $2A(g) + 3B(g) \rightleftharpoons$ Product, 32 times, it is necessary to :

(A) Make the conc. of A and B three times (B) Make the conc. of A and B two times

(C) Make the conc. of A and B half (D) Make the conc. of A and B four times

4. For the reaction, $A + 2B \rightleftharpoons 2C$, the rate constants for the forward and the backward reactions are 1×10^{-4} and 2.5×10^{-2} respectively. The value of equilibrium constant, K for the reaction would be :

(A) 1×10^{-4} (B) 2.5×10^{-2} (C) 4×10^{-3} (D) 2.5×10^{2}

5. An equilibrium system for the reaction between hydrogen and iodine to give hydrogen iodide at 765 K in a 5 litre volume contains 0.4 mole of hydrogen, 0.4 mole of iodine and 2.4 moles of hydrogen iodide. The equilibrium constant for the reaction is : $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$

(A) 36 (B) 15 (C) 0.067 (D) 0.28.

6. For a gasesous reaction, $2A + B \rightleftharpoons 2C$, the partial pressures of A, B and C at equilibrium are 0.3 atm, 0.4 atm and 0.6 atm respectively. The value of K_p for the reaction would be :

(A) 10 atm^{-1} (B) 1/10 atm^{-1} (C) 0.2 atm^{-1} (D) 5 atm^{-1}

7. The active mass of 64 g of HI in a two litre flask would be :

(A) 2 (B) 1 (C) 5 (D) 0.25

8. For the reaction , $A + B \rightleftharpoons 3C$, if 'a' moles/litre of each 'A' & 'B' are taken initially , then the incorrect relation about concentrations at equilibrium is :

(A) $[A] - [B] = 0$ (B) $3[B] + [C] = 3a$ (C) $3[A] + [C] = 3a$ (D) $[A] + [B] = 3[C]$

Answer Key

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1.	(B)	**2.**	(C)	**3.**	(B)	**4.**	(C)	**5.**	(A)
6.	(A)	**7.**	(D)	**8.**	(D)				

Hints & Solutions

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5. $\underset{0.4}{H_2} + \underset{0.4}{I_2} \rightleftharpoons \underset{2.4}{2HI}$

$K = \frac{2.4 \times 2.4}{0.4 \times 0.4} = 36$ (Since volume term is cancelled)

7. Mol. mass of HI = 1 + 127 = 128

64 g HI = 64 / 128 = 0.5 mole

$[HI] = \frac{0.5}{2}$ M = 0.25 M