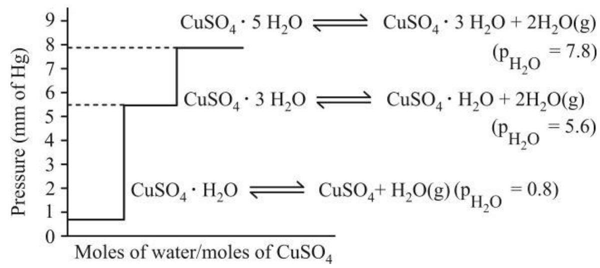
Date Planned : __ / __ / __	**Daily Tutorial Sheet-8**	**Expected Duration : 90 Min**
Actual Date of Attempt : __ / __ / __	**Level-2**	**Exact Duration :________**

Paragraph for Question No. 96 - 98

Dehydration of salts is an important class of heterogeneous reactions. The salt hydrates during dehydration often dissociates in steps to form a number of intermediate hydrates according to the prevailing pressure of moisture in contact with the solid hydrates. Thus copper sulphate pentahydrate on dissociation yields trihydrates, monohydrates and then the anhydrous salt in the above order as follows :



96. The equilibrium constant K_p for the equilibrium between pentahydrate and trihydrate is :

(A) 7.8 **(B)** 60.84 **(C)** 31.36 **(D)** 5.6

97. The ratio of equilibrium constant of equilibrium between pentahydrate and trihydrate and equilibrium between trihydrate and monohydrate is :

(A) 1.9 **(B)** 2.9 **(C)** 8.6 **(D)** 5.6

98. Which of the following condition is favourable for dehydration of $CuSO_4 \cdot 5H_2O$?

I. Low humidity in air **II.** High temperature **III.** increase in p_{H_2O}

The correct option is :

(A) I **(B)** I, II

(C) II, III **(D)** I, II, III

99. For an ideal-gas reaction $2A + B \rightleftharpoons C + D$ the value of K_p will be :

(A) $K_p = \dfrac{n_C n_D}{n_A^2\, n_B} \cdot \dfrac{V}{RT^2}$ **(B)** $K_p = \dfrac{n_C n_D}{n_A^2\, n_B} \cdot \dfrac{V}{RT}$

(C) $K_p = \dfrac{n_C n_D}{n_A^2\, n_B} \cdot \dfrac{RT}{V}$ **(D)** $K_p = \dfrac{n_C n_D}{4n_A^2\, n_B} \cdot \dfrac{V}{RT}$

100. 40% of a mixture of 0.2 mol of N_2 and 0.6 mol of H_2 react to give NH_3 according to the equation : $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$ at constant temperature and pressure. Then the ratio of the final volume to the initial volume of gases are :

(A) 4 : 5 **(B)** 5 : 4 **(C)** 7 : 10 **(D)** 8 : 5

101. For a reversible reaction : $A + B \rightleftharpoons C$

$$\left(\frac{dx}{dt}\right) = 2.0 \times 10^3\,L\,mol^{-1}\,s^{-1}[A][B] - 1.0 \times 10^2\,s^{-1}[C]$$

where x is the amount of 'A' dissociated. The value of equilibrium constant (K_{eq}) is :

(A) 10 **(B)** 0.05

(C) 20 **(D)** Can't be calculated

102. In a 1.0 L aqueous solution when the reaction $2Ag^{+}(aq) + Cu(s) \rightleftharpoons Cu^{2+}(aq) + 2Ag(s)$ reaches equilibrium, $[Cu^{2+}] = xM$ and $[Ag^{+}] = yM$. If the volume of solution is doubled by adding water, then at equilibrium :

(A) $[Cu^{2+}] = \frac{x}{2}M,\ [Ag^{+}] = \frac{y}{2}M$ **(B)** $[Cu^{2+}] > \frac{x}{2}M,\ [Ag^{+}] > \frac{y}{2}M$

(C) $[Cu^{2+}] < \frac{x}{2}M,\ [Ag^{+}] > \frac{y}{2}M$ **(D)** $[Cu^{2+}] < \frac{x}{2}M,\ [Ag^{+}] < \frac{y}{2}M$

103. $I_2 + I^- \rightleftharpoons I_3^-$

This reaction is set-up in aqueous medium. We start with 1 mol of I_2 and 0.5 mol of I^- in 1 L 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

104. A gas 'X' when dissolved in water, heat is evolved. Then solubility of 'X' will increases :

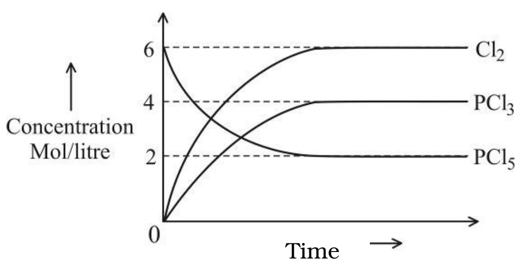
(A) Low pressure, high temperature **(B)** Low pressure, low temperature

(C) High pressure, high temperature **(D)** High pressure, low temperature

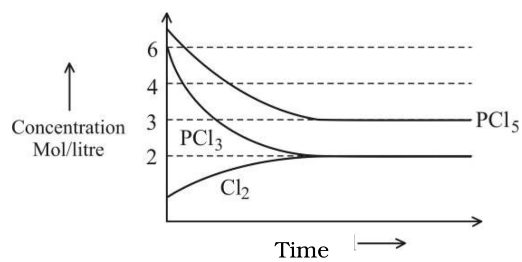
105. For the reaction $PCl_5 \rightleftharpoons PCl_3(g) + Cl_2(g)$

Which of the following sketch may represent above equilibrium? Assume equilibrium can be achieved from either side and by taking any one or more components initially.

(Given K_C for the reaction < 2) ?



(A)



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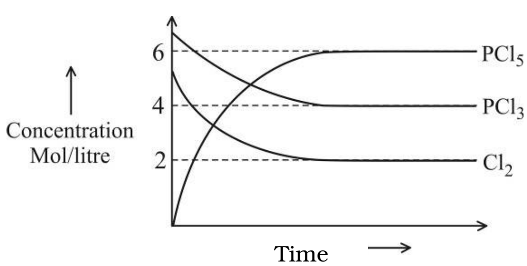
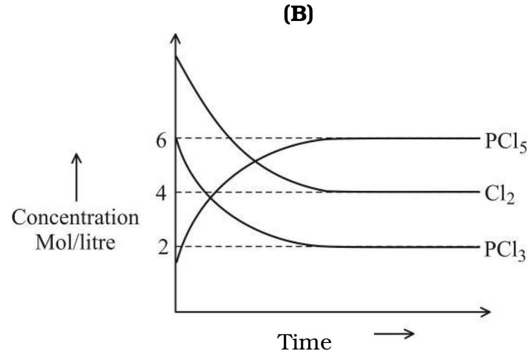


(C)



(D)