

1. For a concentrated solution of a weak electrolyte (K_{eq} = equilibrium constant) A_2B_3 of concentration 'C', the degree of dissociation ' α ' is

[2023 (06 Apr Shift 1)]

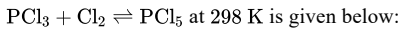
(1) $\left(\frac{K_{eq}}{5c^4}\right)^{\frac{1}{5}}$

(2) $\left(\frac{K_{eq}}{108c^4}\right)^{\frac{1}{5}}$

(3) $\left(\frac{K_{eq}}{25c^2}\right)^{\frac{1}{5}}$

(4) $\left(\frac{K_{eq}}{6c^5}\right)^{\frac{1}{5}}$

2. The equilibrium composition for the reaction



$$[PCl_3]_{eq} = 0.2 \text{ mol L}^{-1}, [Cl_2]_{eq} = 0.1 \text{ mol L}^{-1}, [PCl_5]_{eq} = 0.40 \text{ mol L}^{-1}$$

If 0.2 mol of Cl_2 is added at the same temperature, the equilibrium concentrations of PCl_5 is $\underline{\hspace{2cm}} \times 10^{-2} \text{ mol L}^{-1}$

Given: K_c for the reaction at 298 K is 20

[2023 (06 Apr Shift 2)]

3. The number of correct statement/s involving equilibria in physical processes from the following is _____

(A) Equilibrium is possible only in a closed system at a given temperature.

(B) Both the opposing processes occur at the same rate.

(C) When equilibrium is attained at a given temperature, the value of all its parameters became equal

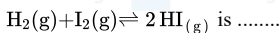
(D) For dissolution of solids in liquids, the solubility is constant at a given temperature.

[2023 (10 Apr Shift 1)]

4. A mixture of one mole of H_2O and 1 mole of CO is taken in a 10 litre container and heated to 725 K. At equilibrium 40% of water by mass reacts with carbon monoxide according to the equation: $CO(g) + H_2O(g) \rightleftharpoons CO_2(g) + H_2(g)$. The equilibrium constant $K_C \times 10^2$ for the reaction is _____ (Nearest integer)

[2023 (11 Apr Shift 1)]

5. 4.5 moles each of hydrogen and iodine is heated in a sealed ten litre vessel. At equilibrium, 3 moles of HI were found. The equilibrium constant for



[2023 (11 Apr Shift 2)]

