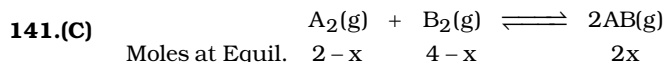


HINTS & SOLUTION TO WORKBOOK - 2

Chemical Equilibrium

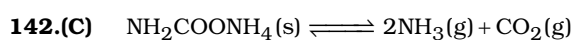
Daily Tutorial Sheet - 12

Level-3



$$K_c = \frac{4x^2}{(2-x)(4-x)} \Rightarrow x = \frac{32}{24} = 1.33 \text{ mole}$$

$$[\text{AB}(\text{g})] = \frac{2 \times 1.33}{4} = 0.66 \text{ M}$$



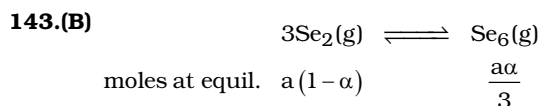
Let partial pressure at equilibrium of CO_2 be P , then $P_{\text{NH}_3} = 2P$ and total pressure at equilibrium = $3P$

$$K_P = (2P)^2 \times P = 4P^3 \quad \dots\dots\dots(\text{i})$$

If NH_3 is added and the pressure of NH_3 after addition at equilibrium is $3P$.

$$K_P = 4P^3 = (P'_{\text{NH}_3})^2 \times P'_{\text{CO}_2}$$

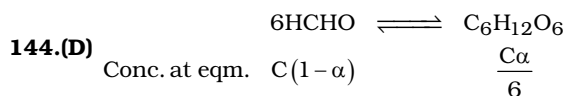
$$\Rightarrow P'_{\text{CO}_2} = \frac{4}{9}P \quad \therefore \text{Ratio of } \frac{P'_{\text{CO}_2}}{P_{\text{CO}_2}} = \frac{4}{9}$$



$$\frac{\text{observed no. of moles at equilibrium}}{\text{Initial no. of moles of reactant}} = \frac{M_T}{M_O} \Rightarrow \frac{a(1-\alpha) + \frac{a\alpha}{3}}{a} = \frac{M_T}{M_O} = \alpha = 0.315$$

Where molar mass of Se_2 , $(M_T) = 79 \times 2 = 158$

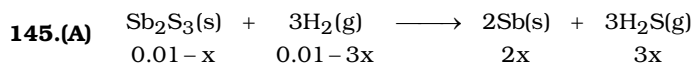
$$\text{and molar mass of mixture } (M_O) = \frac{wRT}{PV} = \frac{0.02 \times 24.63}{1 \times 2.463 \times 10^{-3}} = 200$$



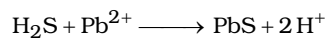
$$\frac{\text{observed moles concentration}}{\text{Initial moles concentration}} = \frac{M_T}{M_O}$$

M_T = Theoretical molar mass of HCHO

$$\frac{C(1-\alpha) + \frac{C\alpha}{6}}{C} = \frac{M_T}{M_O} = \frac{30}{150}$$



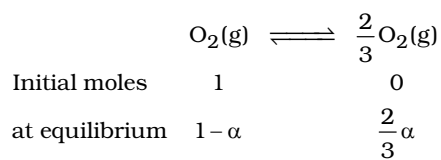
Where $3x = 0.005$



number of moles of PbS formed = $\frac{1.19}{238} = 0.005$ mole

At equil. $[\text{H}_2] = \left(\frac{0.01 - 0.005}{250} \right)$; $K_c = \left(\frac{0.005}{0.005} \right)^3 = 1$

146.(C)
$$\frac{r_{\text{mix}}}{r_{\text{O}_2}} = \sqrt{\frac{32}{M_{\text{mix}}}} = 0.4\sqrt{5} \Rightarrow M_{\text{mix}} = 40 \text{ g/mol}$$



$$\frac{32}{40} = \frac{1 - \alpha + \frac{2}{3}\alpha}{1} \Rightarrow \alpha = 0.6 \therefore \% \alpha = 60$$