D. B. College (Jaynagar) Lect- 8
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Ques $3A \rightleftharpoons B + 2C$

If initial moles of A is 10 & 40% dissociation of A takes place at eqm then find

① total moles at eqm ② moles of B & C at eqm

$3A \rightleftharpoons B + 2C$

10

$a-x$ $\quad \frac{x}{3} \quad \frac{2x}{3}$

$10-4=6$

$4\% = \frac{x}{10} \times 100 = 4/3 \qquad = \frac{2}{3} \times 4 = 8/3$

$x = 4$

① $6 + \frac{4}{3} + \frac{8}{3} = \frac{18+4+8}{3} = \frac{30}{3} = 10$

② $B \longrightarrow 4/3$

③ $C \longrightarrow 8/3$

Ques $A \rightleftharpoons 3B + 2C$

If initial moles of A is given 10 & total moles at eqm 30 then find. DOD

$A \rightleftharpoons 3B + 2C$

10

$= a-x \qquad 3x \qquad 2x$

$= 10-x = 10-5$

$\Rightarrow 10-x+3x+2x = 30$

$10 + 4x = 30$

$x = \frac{20}{4} = 5$

$D.O.D = \frac{5}{10} = \frac{1}{2}$

Ques $N_2 + 3H_2 \rightleftharpoons 2NH_3$

10 moles of N_2 & 20 moles of H_2 is taken initially in a container of volume 6L If 40% dissociation of N_2 takes place then. Find K_c & K_p at 300K

$N_2 + 3H_2 \rightleftharpoons 2NH_3$

10 20

$10-x \qquad 20-3x \qquad 2x$

$10-4=6 \qquad 20-3\times4 \qquad 2\times4=8$

$20-12$

$40 = \frac{x}{10} \times 100 \qquad = 18$

$x = 4$

$[N_2] = \frac{6}{6} = 1$ $\quad [NH_3] = 8/6$

$[H_2] = 8/6$

$$K_c = \frac{[4/3]^2}{[1][4/3]^3} = \frac{\frac{16}{9}}{1 \times \frac{64}{27}} = \frac{16 \times 27^3}{9 \times 64_4}$$

$$K_p = K_c (RT)^{\Delta ng} \qquad = \frac{3}{4}$$

$$= \frac{3}{4}(0.08 \times 300)^{-2} \quad \Big| \quad \Delta ng = -2$$

$$= \frac{3}{4}(24)^{-2}$$

$$= \frac{3}{4} \times \frac{1}{(24)^2}$$

$$= \frac{3}{4} \times 576 = \frac{3}{2304}$$

$$K_p = \frac{1}{768}$$

Ques $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$

10 moles of H_2 & 20 moles of I_2 is taken initially in a container of volume 5L find K_c & K_p for reach if 40% dissociation of H_2 takes place

$$H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$$

10 $\quad$ 20

$10-x \quad 20-x \quad 2x$

$10-4 \quad 20-4 \quad 2\times4 = 8$

$= 6 \quad = 16$

$$40 = \frac{x}{10} \times 100$$

$$x = 4$$

At eqm $\frac{n}{V} \quad \frac{6}{5} \quad \frac{16}{5} \quad \frac{8}{5}$

$$K_c = \frac{\left[\frac{8}{5}\right]^2}{\left[\frac{6}{5}\right]\left[\frac{16}{5}\right]} = \frac{\frac{64}{25}}{\frac{16\times6}{25}} = \frac{64}{16\times6}$$

$$= \frac{2}{3}$$

$$K_p = \frac{2}{3}(RT)^0$$

$$K_p = \frac{2}{3}$$