Nishant Jindal

O-I 37-40

52-60

S-I 17-31

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(38)

$$\underset{1-x}{C_2H_5OH(l)} + \underset{1-x}{CH_3COOH(l)} \rightarrow \underset{x}{CH_3COOC_2H_5(l)} + \underset{x}{H_2O(l)}$$

$$K_c = \frac{[\quad][H_2O]}{[C_2H_5OH][\quad]}$$

$$C_2H_5OH(aq) + CH_3COOH(aq) \rightarrow CH_3COOC_2H_5(aq) + H_2O(l)$$

$$K_c = \frac{[CH_3COOC_2H_5]}{[\quad][\quad]}$$

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55)

$$2HI \longrightarrow H_2 + I_2$$

$$1-\alpha \qquad \alpha/2 \qquad \alpha/2$$

57)

$$N_2O_4 \longrightarrow 2NO_2$$

$M_{avg} \downarrow$

$V.D \downarrow$

$Kp$

$\downarrow$

$\alpha$

$\downarrow$

$M_{avg}$

$|$

density

$$PM = dRT$$

59)

$$A_2 \longrightarrow B_2 + C_2$$

$$1-\alpha \qquad \alpha \qquad \alpha$$

$$Kp = 9 = \frac{\alpha^2}{1-\alpha}\left(\frac{7}{1+\alpha}\right)$$

$$= \frac{\alpha^2}{1-\alpha^2} \times 7$$

$$\alpha = 3/4 = 0.75$$

$$M_{avg} = \frac{70}{1+\alpha} = \frac{70}{1.75}$$

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(17) $H_2(g) + S(s) \longrightarrow H_2S(g)$

$0.2 - x \qquad\qquad x$

$$K = 6.8 \times 10^{-2} = \frac{x}{0.2 - x}$$

(20) $CaCO_3(s) \longrightarrow \underline{\underline{CaO(s)}} + CO_2(g)$

$$K_p = 4 \times 10^{-2} = P_{CO_2}$$

$$4 \times 10^{-2} \times V = n \times RT$$

$$\boxed{W_{CaO} = n \times 56}$$

(22) $P^5_{H_2O} = 3125 \times 10^{-15}$

$$P_{H_2O} = 5 \times 10^{-3}$$

(23) $\frac{1}{P^6_{H_2O}} = 64 \times 10^{84}$

$$\frac{1}{P_{H_2O}} = 2 \times 10^{14}$$

$$P_{H_2O} = \frac{1}{2} \times 10^{-14} = 5 \times 10^{-15}$$

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25

31

$$K_p = \frac{\alpha^2}{1-\alpha^2} P$$

$$1.78 = \frac{\alpha^2}{1-\alpha^2} \times 1$$

$\alpha$

$\downarrow$

$M_{avg}$

$\downarrow$

$PM = dRT$

$$1.78 = 2.78\,\alpha^2$$

$$\sqrt{\frac{178}{278}} = \alpha$$

$$\sqrt{\frac{89}{139}}$$

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**Le-chatelier principle** :→ If a system at eqlb$^m$ is subjected to a change in any one of the parameter like moles, volume, temperature etc, the system try to nullify (compensate) that change as far as possible

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## ① Effect of addition and removal of a substance

$$A + B \longrightarrow C$$

at eq$^{lb^m}$   $a$   $b$   $c$

$Q > K$ backward

$Q < K$ forward

$$K_c = \frac{c}{a \times b} \times V = \frac{[C]}{[A][B]}$$

add$^n$ of reactants at eq$^{lb^m}$ favours forward Rxn

" product " " backward Rxn

$$H_2(g) + S(s) \rightarrow H_2S(g)$$

$$K_c = \frac{[H_2S]}{[H_2]}$$

add$^n$ of $S(s)$ has no effect

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$$A + B \longrightarrow C$$

at eq/b$^m$ $\quad a+x \quad b+x \quad c \cancel{+x}$

$$K_c = \frac{[C]}{[A][B]} = \frac{c}{a \times b} \times V$$

$$Q > K_c$$

$$A \longrightarrow C$$

$$a \qquad c + x$$

$$A(s) \longrightarrow A(g)$$

$$a + x$$

$$K_c = [A]$$

$$= a$$

100% compensation occurs

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Q. for the given rxn

$$A(g) + B(g) \longrightarrow C(g) + D(g)$$

| | | | | |
|---|---|---|---|---|
| 4 | 4 | 2 | 8 | ← old eqlbm |
| 4 | 4 | 2 | 26 | |
| 4+x | 4+x | 2−x | 26−x | |

the no. of moles at eqlbm was found to be 4, 4, 2 & 8 respectively in 1 lit container. find the no. of moles at new eqlbm if 18 moles of D are added to above container

$$1 = \frac{(2-x)(26-x)}{(4+x)(4+x)}$$

| | | | | |
|---|---|---|---|---|
| 5 | 5 | 1 | 25 | new eqlbm |

| | $A$ + | $B$ $\longrightarrow$ | $C$ + | $D$ |
|---|---|---|---|---|
| add$^n$ of 'D' | $\uparrow$ | $\uparrow$ | $\downarrow$ | $\uparrow$ |
| add$^n$ of A | $\uparrow$ | $\downarrow$ | $\uparrow$ | $\uparrow$ |
| add$^n$ of C | $\uparrow$ | $\uparrow$ | $\uparrow$ | $\downarrow$ |
| Removal of B | $\uparrow$ | $\downarrow$ | $\downarrow$ | $\downarrow$ |

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## (II) Effect of change in pressure

akk7007

0 - I

Upto 62

S - II

1 - 4