

$$K = \frac{(2x)^2 x^2}{(0.2-x)(0.4-x)}$$

$$0.08 + x^2 - 0.6x = x^2$$

$$x = \frac{0.08}{0.6} = \frac{8}{60} = \frac{2}{15}$$

$$0.2 - \frac{2}{15}$$

$$\frac{1}{15}$$

$$\frac{4}{15}$$

$$\frac{4}{15}$$

$V = 10 \text{ lit}$



$$\frac{(2x)^2 x^2}{(0.2-x)(0.4-x)} = 2$$

$$2x^2 = 0.08 + x^2 - 0.6x$$

$$x^2 + 0.6x - 8 \times 10^{-2} = 0$$

$$x = \frac{-0.6 + \sqrt{36 \times 10^{-2} + 4 \times 8 \times 10^{-2}}}{2}$$

$$= \frac{-6 \times 10^{-1} + \sqrt{68} \times 10^{-1}}{2} = \frac{(8.25 - 6) \times 10^{-1}}{2}$$

$$x = \frac{1.125 \times 10^{-1}}{2}$$



$$K_c = 10^{-5} \text{ M}$$

$$\frac{10^{-5}}{0.1} = 10^4$$

$$V = 10 \text{ lit}$$

$$1 \text{ mol}$$

$$\begin{matrix} 0 & 0 \\ x & x \end{matrix}$$

$$\frac{10^{-3}}{0.1} \times 100 = 1\%$$

$$10^{-5} = \frac{x^2}{0.1-x}$$

$$x^2 + 10^{-5}x - 10^{-6} = 0$$

$$x = \frac{-10^{-5} + \sqrt{10^{-10} + 4 \times 10^{-6}}}{2} = \frac{-10^{-5} + 2 \times 10^{-3}}{2}$$

$$= \frac{-10^{-5} + 200 \times 10^{-5}}{2}$$

$$= \frac{199 \times 10^{-5}}{2} = 99.5 \times 10^{-5}$$

$$= 0.995 \times 10^{-3}$$

$$\approx 10^{-3}$$

$$10^{-5} = \frac{x^2}{0.1-x}$$

$$x^2 = 0.1 \times 10^{-5} = 10^{-6}$$

$$x = 10^{-3}$$

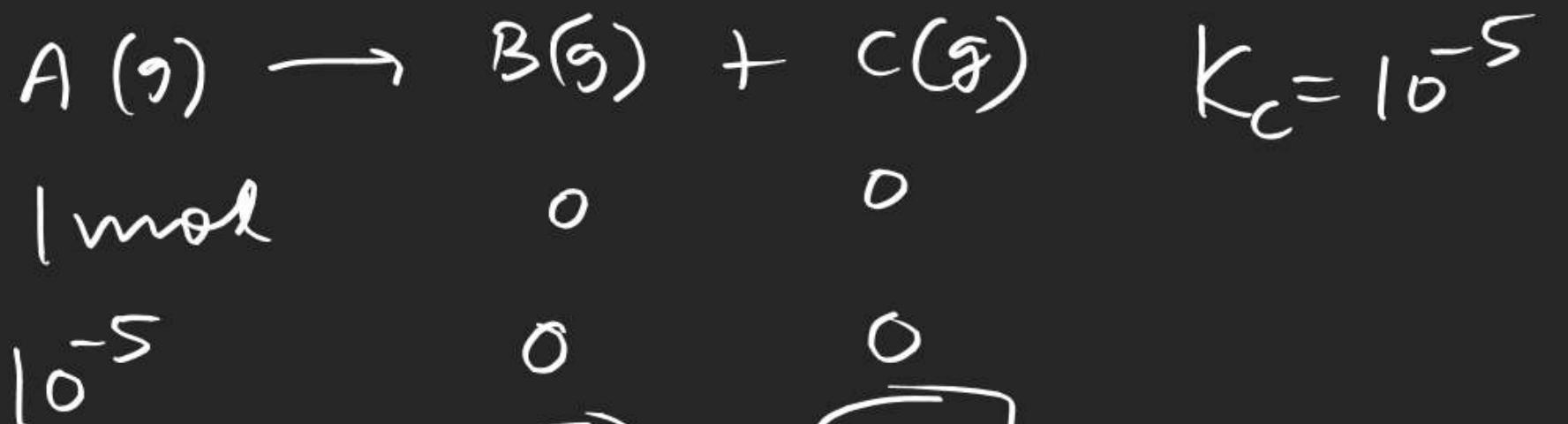
$$\text{if } \frac{K_c}{[\text{initial conc}]} \leq 10^{-3}$$

then  $x$  can be neglected  
wrt C

$x$  can be neglected  
wrt C

Q.

$$V = 10^5 \text{ lit}$$



$$\sqrt{5} = 2.23$$

$\approx 2.24$

$$10^{-5} = \frac{x^2}{10^{-5} - x}$$

~~$x = 10^{-5}$~~

$$10^{-5} = \frac{x^2}{10^{-5} - x}$$

$$x^2 + 10^{-5}x - 10^{-10} = 0$$

$$x = \frac{-10^{-5} + \sqrt{10^{-10} + 4 \times 10^{-10}}}{2}$$

$$x = \frac{\sqrt{5}-1}{2} \times 10^{-5} = 0.62 \times 10^{-5}$$

$$\frac{K_c}{C} = \frac{10^{-5}}{10^{-5}} = 1 > 10^{-3}$$

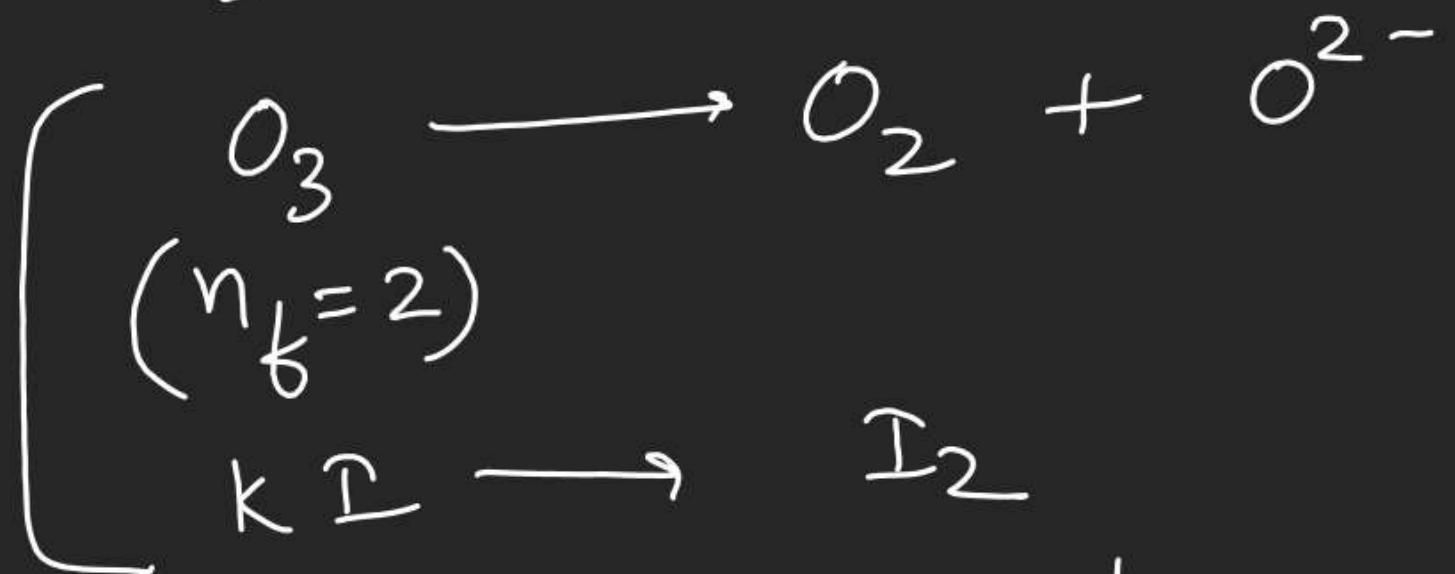
$$\begin{array}{l} \text{eqlb}^m \\ 0-I-15 \\ S-I-10 \end{array}$$

$$\begin{array}{r|rr} & 8.24 \\ \hline 8 & 68 \\ 8 & 64 \\ \hline 162 & 400 \\ 2 & 324 \\ \hline 1644 & 7600 \\ 4 & 6576 \\ \hline 1648 & \end{array}$$

(3)



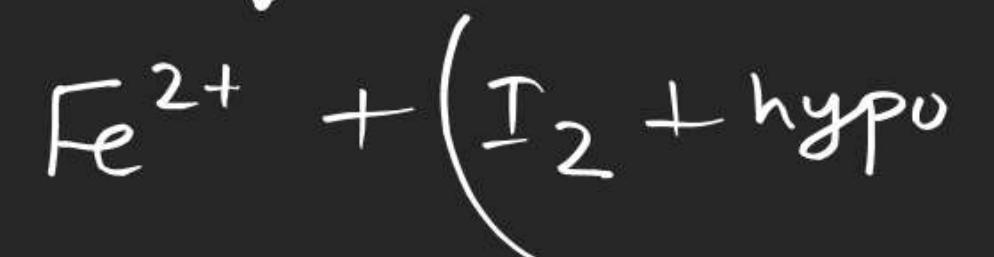
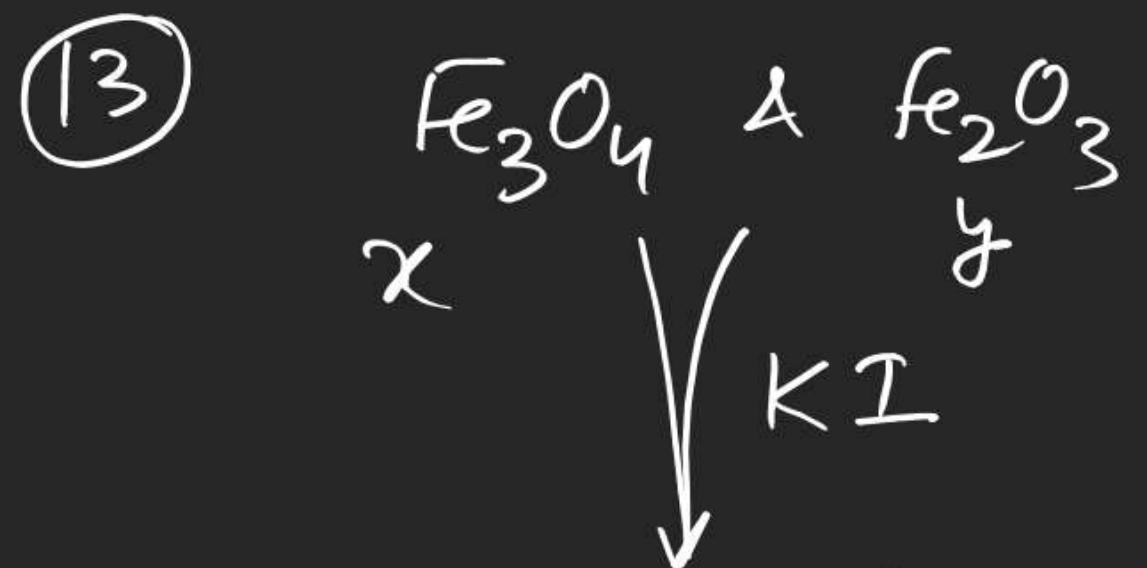
Let at STP



eq g  $\text{O}_3$  = eq g hypo

$$\frac{\eta_{\text{O}_3} \times 2}{\eta_{\text{O}_2}} = \frac{40 \times 1}{10} \times 1$$

$$\eta_{\text{O}_2} = 2 \times 10^{-3}$$



$$\frac{20}{50} (2x + 2y) = 11 \times 0.5 \times 1$$

(15)



$$n_f = 5$$

10  
13  
15

$$20 \times M \times 2 = \frac{M_{\text{KMnO}_4}}{2} \times 20 \times 5$$

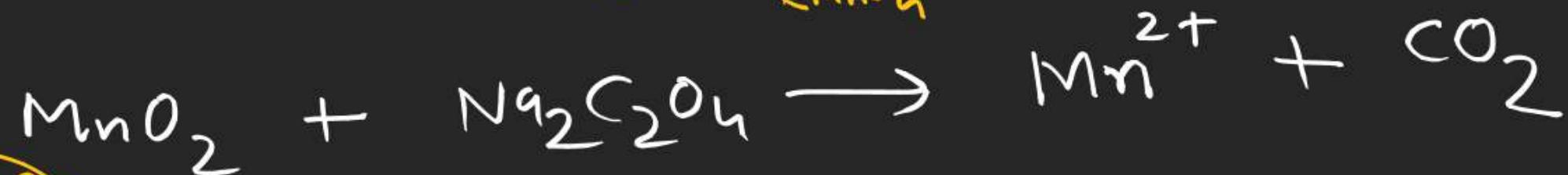
$$n_f = 3$$



$$\text{MnO}_2 \xrightarrow{\frac{2 \times 3}{5}} = \frac{6}{5} = n_f$$

$$10 \times 20 \times M \times 3 = 2 \text{ mmoles} \times \frac{6}{5}$$

$$M_{\text{KMnO}_4} = \frac{1}{25}$$



$$n_f = 2$$

$$\begin{aligned} & 10 \times 0.2 \times 2 \\ & = 4 \text{ molar} \\ & 2 \text{ mmol} \end{aligned}$$