Q. find the volume of 0.1M $K_2Cr_2O_7$ required to oxidise 0.5 mol Cu_2S into Cu^{2+} & SO_2.

20/3 lit
400 ml
6.67 lit
5 lit
4/3 lit
10/3 lit

$$K_2Cr_2O_7 + \overset{+1\ \ -2}{Cu_2S} \longrightarrow \overset{+2}{Cu^{2+}} + \overset{+4}{SO_2} + Cr^{3+}$$

(1) (6)

$n_f = 2 + 6$

$$0.1 \times V \times 6 = 0.5 \times 8$$

$$V = \frac{40}{6} = \frac{20}{3} \text{ lit}$$

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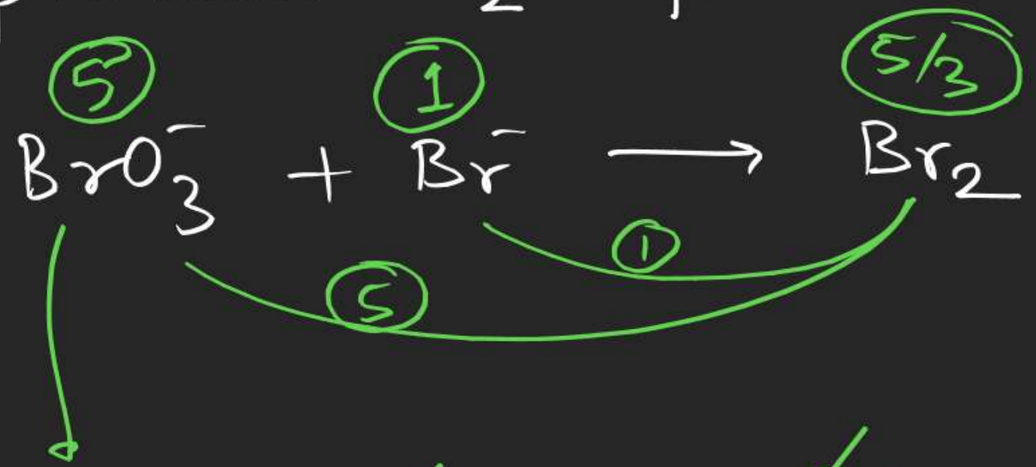
Q. 50ml 0.5 M BrO_3^- reacts with excess Br^- to produce Br_2. find mass of Br_2 formed. [Br = 80]



$n_f = \frac{2 \times 10}{2+10} = 5/3$

$\frac{50}{1000} \times 0.5 \times 5 = n \times 5/3$

$\frac{75}{1000} = \text{moles}$

$\frac{75}{1000} \times 160 = 12\text{ gm}$

6 gm
25/3 gm
6000
2 gm
2 kg
1000 g

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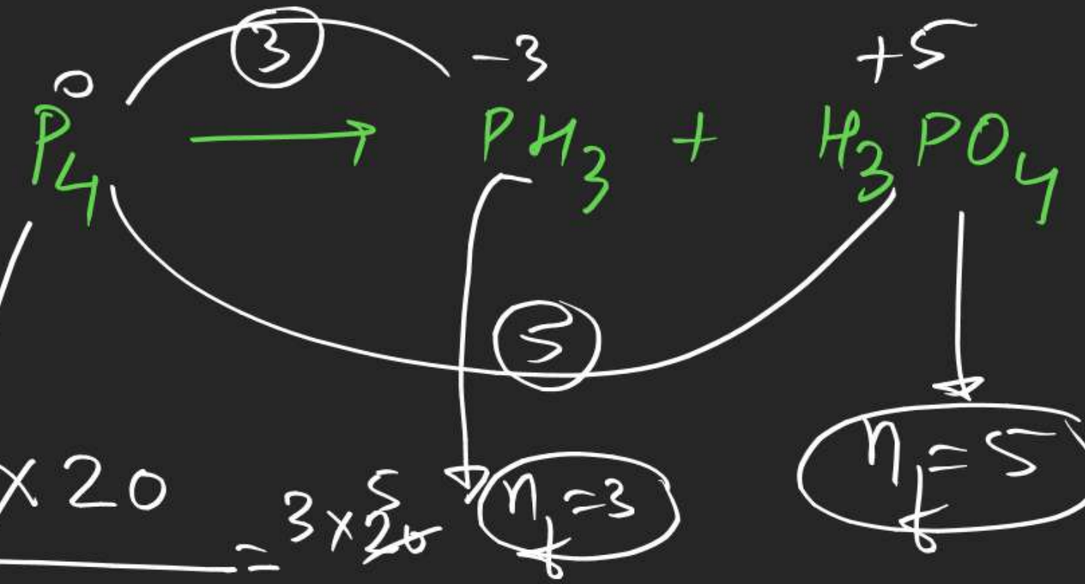
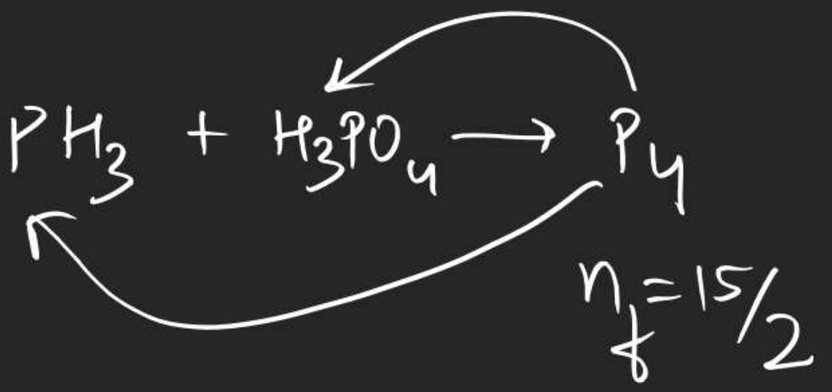


$$n_f = \frac{12 \times 20}{12 + 20} = \frac{3 \times 5}{8_2}$$

$$= 15/2$$



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O.A + $\overset{+3}{C_2O_4^{2-}} \xrightarrow{①} \overset{+4}{CO_2}$ $\quad n_f = 2$

O.A + $H_2C_2O_4 \longrightarrow CO_2$ $\quad n_f = 2$

O.A + $K_2C_2O_4 \longrightarrow CO_2$ $\quad n_f = 2$

O.A + $\underbrace{KHC_2O_4 \cdot H_2C_2O_4}_{n_f = 4} \longrightarrow CO_2$

O.A + $\underbrace{H_2C_2O_4 \cdot 3KHC_2O_4}_{n_f = 8} \longrightarrow CO_2$

O.A + $KHC_2O_4 \longrightarrow CO_2$ $\quad n_f = 2$

$KOH + KHC_2O_4 \longrightarrow K_2C_2O_4 + H_2O$ $\quad n_f = 1$

$KOH + KHC_2O_4 \cdot H_2C_2O_4 \longrightarrow K_2C_2O_4 \cdot K_2C_2O_4$ $\quad n_f = 3$

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Q. find moles of $K_2Cr_2O_7$ and KOH required to titrate (react) 100 ml 0.5M $H_2C_2O_4 \cdot 2KHC_2O_4$ separately

$$K_2Cr_2O_7 + H_2C_2O_4 \cdot 2KHC_2O_4 \rightarrow CO_2 + Cr^{3+} \qquad \frac{1}{20}, \frac{3}{20}$$

$n_f = 6$ $\qquad$ $n_f = 6$

$$n \times 6 = \frac{100 \times 0.5 \times 6}{1000}$$

$$n = 0.05 = \frac{1}{20}$$

$$KOH + H_2C_2O_4 \cdot 2KHC_2O_4 \rightarrow K_2C_2O_4 \cdot 2K_2C_2O_4$$

$n_f = 1$ $\qquad$ $n_f = 4$

$$n \times 1 = \frac{100 \times 0.15}{1000} \times 4$$

$$n = 0.2 = \frac{2}{10}$$

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Titration

$$HCl + NaOH \rightarrow NaCl + H_2O$$

1 mol	1 mol	0	
0	0	1 mol	1 mol
1 eq	1 eq		

$$M_1V_1 \times n_1 = M_2V_2 \times n_2$$

equivalence point
= point at which equivalents become equal

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O-I 37-41

S-I 23-28

O-II 1-13

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(27) $\overset{+5}{NO_3^-} \longrightarrow \overset{-1}{NH_2OH}$

6

20/9

(29) $Fe_{0.9}O \longrightarrow Fe^{3+}$

$\overset{-2}{S}=\overset{+4}{C}=\overset{-3}{N}^-$

(31) $\overset{-2\ +4\ -3}{Ba(SCN)_2} \rightarrow \overset{+6}{SO_4^{2-}} + \overset{+4}{CO_3^{2-}} + \overset{+5}{NO_3^-}$

8, 8

$= 2\times 8 + 2\times 5$

$n_f = 32$

(30) $BrO_3^- + Br^- \longrightarrow Br_2$

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(34) Fe^{2+} Fe^{3+}

Cu^{+} Cu^{2+}

Sn^{2+} Sn^{4+}

As^{3+} As^{5+}

Pb^{2+} Pb^{4+}

(34) $\overset{+7}{KMnO_4} + \overset{+3}{As_2O_3} \longrightarrow H_3AsO_4 + Mn^{2+}$

$n_f = 5$

$n_f = 4$

(2)

$\frac{0.02}{100} \times V \times 5 = 1 \times 4$

$\frac{0.02}{10}$

$V = 40$ ml

(36) $A + e^{\ominus} \longrightarrow$

$= \frac{6 \times 10^{20}}{6 \times 10^{23}}$

$= 10^{-3}$ equivalents

(14) $K_2Cr_2O_7 + KI \longrightarrow Cr^{3+} + I_2$

$n_f = 6 \qquad n_f = 1$

$n \times 6 = 40 \times 0.1 \times 1$

$n = 2/3 = 0.667$

(15) $Sn + K_2Cr_2O_7 \longrightarrow Cr^{3+} + SnCl_4$

$\frac{11.9}{119} \times 4 = 0.1N \times V$

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(16) $KMnO_4 + \overset{+2}{S_2O_3^{2-}} \longrightarrow \overset{+6}{SO_4^{2-}} + Mn^{4+}$

$KMnO_4$ → $n_f = 3$; $S_2O_3^{2-}$ → (4) → SO_4^{2-} → $n_f = 4$

$$18 \times 3 = x \times 4$$

(21) $KMnO_4 + \overset{-1}{H_2O_2} \longrightarrow \overset{0}{O_2} + Mn^{2+}$

$KMnO_4$ → $n_f = 5$; H_2O_2 → (1) → O_2 → $n_f = 2$

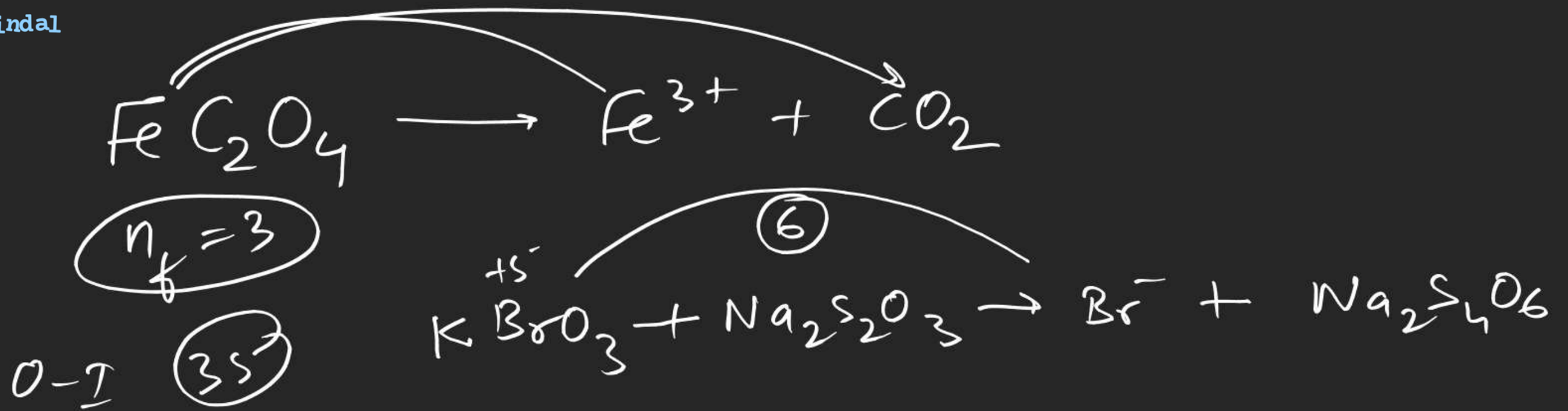
$$\frac{x}{1000} \times N = \frac{1 \times x}{\frac{100}{34} \times 2}$$

O.A. + H_2O_2 (2) → O_2

R.A + H_2O_2 (2) → H_2O

$H_2O_2 \rightarrow H_2O + O_2$

$\frac{2 \times 2}{2+2} = 1$



$$\frac{0.167}{167} \times 6 = \frac{45 \times N}{1000}$$

$$N = \frac{6}{45}$$

$$N = \frac{2}{15}$$