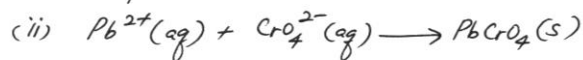


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Q₁(a)(i) Precipitation reaction



$$n_{\text{Pb}^{2+}} = n_{\text{PbCrO}_4} \quad (\because M_r(\text{PbCrO}_4) = 207.2 + 51.9961 + 4(15.999)) \\ = 323.192 \text{ g mol}^{-1})$$

$$\frac{M(100)}{1000} = \frac{1.65}{323.192}$$

$$\therefore M_{\text{Pb}^{2+}} = \frac{1.65 \times 1000}{100 \times 323.192} \text{ mol dm}^{-3} \\ = 0.0511 \text{ mol dm}^{-3}$$

\therefore Concentration of the lead solution = $0.0511 \text{ mol dm}^{-3}$ (Ans) //

$$(iii) M_r(\text{K}_2\text{CrO}_4) = 2(39.0983) + 51.9961 + 4(15.999) \\ = 194.1887 \text{ g mol}^{-1}$$

$$\therefore \text{Concentration of } \text{K}_2\text{CrO}_4 = M_{\text{K}_2\text{CrO}_4} = \frac{0.503 \text{ g}}{194.1887 \text{ g mol}^{-1}} \\ = 0.0104 \text{ mol dm}^{-3}$$

$$M_{\text{CrO}_4^{2-}} = 0.0104 \text{ mol dm}^{-3}$$

$$n_{\text{CrO}_4^{2-}} = n_{\text{PbCrO}_4}$$

$$\frac{(0.0104)V}{1000} = \frac{1.65}{323.192}$$

$$\therefore V_{\text{CrO}_4^{2-}} = \frac{1.65 \times 1000}{323.192 \times 0.0104} = 490.9 \text{ cm}^3$$

\therefore Volume of K_2CrO_4 solution = 490.9 cm^3 (Ans) //

(iv) $2 \text{ mol Cl}^- \equiv 1 \text{ mol Pb}^{2+} \equiv 1 \text{ mol PbCrO}_4$

$$\frac{n_{\text{Cl}^-}}{n_{\text{PbCrO}_4}} = \frac{2}{1} \quad \therefore n_{\text{Cl}^-} = 2 \times n_{\text{PbCrO}_4}$$

$$\frac{1.463 \times V}{1000} = 2 \times \frac{1.65}{323.192}$$

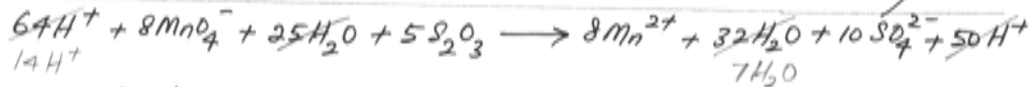
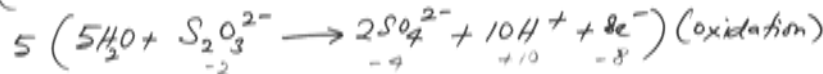
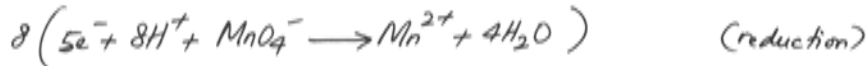
$$\therefore V_{\text{Cl}^-} = V_{\text{NaCl}} = \frac{2 \times 1.65 \times 1000 \text{ cm}^3}{323.192 \times 1.463} \\ = 6.98 \text{ cm}^3$$

\therefore Volume of NaCl solution needed = 6.98 cm^3 (Ans) //

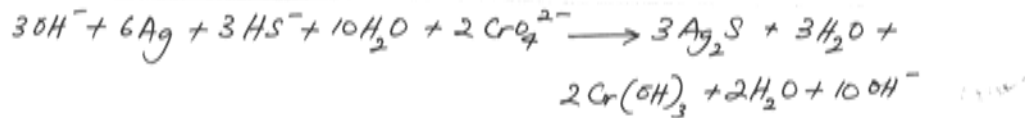
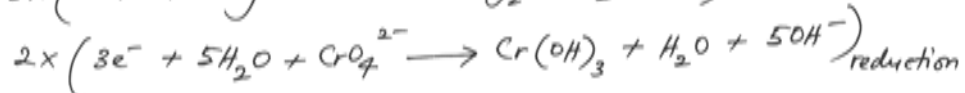
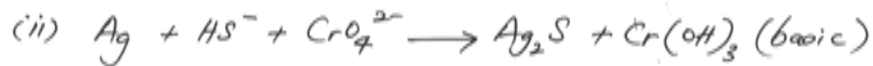
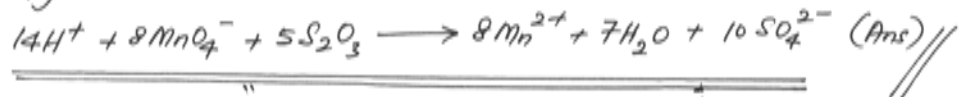
(1/2)

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Q, (b) Balancing equation.



Simplify to:



Simplify to:

