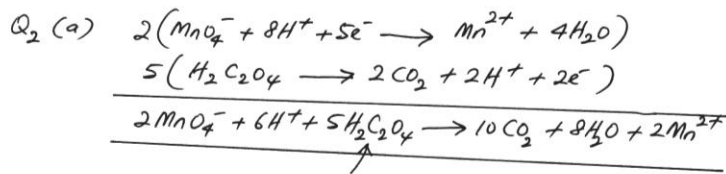


Sem 2 (2008/09) : Stoichiometry



0.2585g

Assume molarity of $\text{MnO}_4^- = M$

$$n_{\text{H}_2\text{C}_2\text{O}_4} = \frac{5}{2} \times n_{\text{MnO}_4^-}$$

$$\left(\frac{0.2585 \text{ g}}{90 \text{ g mol}^{-1}} \right) = \frac{5}{2} \times \left(\frac{22.35 \times M}{1000} \right)$$

$$\therefore M = 0.0515 \text{ mol dm}^{-3}$$

Molarity of the KMnO_4 solution = $0.0515 \text{ mol dm}^{-3}$ //

Cing

Q₂ (b) - see text (types of bonding)

$$\begin{array}{l}
 \text{Q}_3 \text{ (c)} \text{ (i)} \quad 5 \mu\text{m} = 5 \times 10^{-10} \text{ cm} // \\
 \quad \quad \quad \quad \quad \quad \quad = 5 \times 10^{-3} \text{ nm} // \\
 \text{(ii)} \quad 8.5 \text{ cm}^3 = 8.5 \times 10^{-6} \text{ m}^3 // \\
 \quad \quad \quad \quad \quad \quad \quad = 8.5 \times 10^3 \text{ mm}^3 // \\
 \text{(iii)} \quad 65.2 \text{ mg} = 65.2 \times 10^{-3} \text{ g} \\
 \quad \quad \quad \quad \quad \quad \quad = 6.52 \times 10^{-2} \text{ g} // \\
 \quad \quad \quad \quad \quad \quad \quad = 6.52 \times 10^{-2} \times 10^{12} \text{ pg} \\
 \quad \quad \quad \quad \quad \quad \quad = 6.52 \times 10^{10} \text{ pg} //
 \end{array}$$

$$\left. \begin{array}{l}
 [1 \text{ \AA} = 100 \text{ pm} = 0.1 \text{ nm} = 10^{-10} \text{ m}] \\
 1 \text{ pm} = 10^{-10} \text{ cm} = 10^{-8} \text{ m} = 10^{-3} \text{ n} \\
 \left. \begin{array}{l}
 (1 \text{ cm} = 10^{-2} \text{ m})^3 \\
 1 \text{ cm}^3 = 10^{-6} \text{ m}^3 \\
 (1 \text{ cm} = 10 \text{ mm})^3 \\
 1 \text{ cm}^3 = 10^3 \text{ mm}^3
 \end{array} \right\} \\
 1 \text{ mg} = 10^{-3} \text{ g} \\
 1 \mu\text{g} = 10^{-6} \text{ g} \\
 1 \text{ ng} = 10^{-9} \text{ g}
 \end{array} \right\}$$

Q₃ (d) 35.7 mL, 12.0 M HCl $\xrightarrow{\text{diluted}}$ 250.0 mL.

$$(M_1 V_1)_{\text{before}} = (M_2 V_2)_{\text{after}}$$

$$(12.0 \times 35.7) = M_2 (250.0)$$

$$\therefore M_2 = 1.7136 \text{ mol dm}^{-3} //$$