

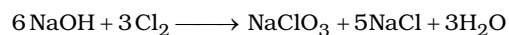
HINTS & SOLUTION TO WORKBOOK-2

Stoichiometry-II (Redox Reactions)

Daily Tutorial Sheet-12	Level-3
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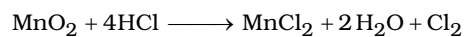
- 141.** (A $\rightarrow$ p, s) (B $\rightarrow$ p, r, s) (C $\rightarrow$ p, q) (D $\rightarrow$ p)
- (A) $\text{O}_2^- \longrightarrow \text{O}_2$ (oxidation) $\text{O}_2^- \longrightarrow \text{O}_2^{2-}$ (Reduction)
- (B) $4 \text{ClO}_3^- \longrightarrow 3 \text{ClO}_4^- + \text{Cl}^-$
 $\text{ClO}_4^- \longrightarrow$ Tetrahedral
- (C) $\text{MnO}_4^- + \text{NO}_2^- + \text{H}^+ \longrightarrow \text{Mn}^{2+} + \text{NO}_3^- + \text{H}_2\text{O}$
 $\text{NO}_3^- \longrightarrow$ Trigonal planar structure
- (D) $\text{NO}_3^- + \text{H}_2\text{SO}_4 + \text{Fe}^{2+} \longrightarrow \text{Fe}^{3+} + \text{NO}$
- 142.(4)** O.S. of $\text{O}_2 \longrightarrow -2, -1, -\frac{1}{2}, +1$
- Ca $\longrightarrow$ zero & +2
- Zn $\longrightarrow$ zero & +2
- F $\longrightarrow$ zero & -1
- Na $\longrightarrow$ zero & +1
- Sn $\longrightarrow$ zero + 2 & +4
- Tl = zero + 1 & +3
- Ti $\longrightarrow$ zero, +2, +3, +4
- 143.(9)** CrO_5 (+6), OsO_4 (+8), K_3CrO_4 (+5), $[\text{Ir}(\text{O})_4]^-$ (+8), $[\text{Ir}(\text{O})_4]^+$ (+9)
- 144.** meq of Cu^{2+} ion in 25 mL = meq of $\text{Na}_2\text{S}_2\text{O}_3 = 22.3 \times \frac{1}{10} = 2.23$ meq
- $\therefore$ In 250 mL,
- meq of $\text{Cu}^{2+} = 22.3$ meq
- $\therefore \frac{22.3}{1000} = \frac{x}{63.5} \Rightarrow x = 1.416 \text{ g}$
- So, % of $\text{Cu}^{2+} = \frac{1.416}{6} \times 100 = 23.6\%$
- 145.** $\text{CaCO}_3 + 2\text{HCl} \longrightarrow \text{CaCl}_2 + \text{H}_2\text{O} + \text{CO}_2$
- | | | | | |
|------|------|------|------|------|
| 2 | 2.74 | — | — | — |
| 0.63 | 0 | 1.37 | 1.37 | 1.37 |
- $\therefore$ Amount of chip undissolved = $(0.63 \times 100) \text{ g} = 63 \text{ g}$
- Amount of $\text{CaCl}_2 = (1.37 \times 111) \text{ g} = 152.07 \text{ g}$
- Amount of $\text{CO}_2 = (1.37 \times 44) \text{ g} = 60.28 \text{ g}$

146. 54.38 g, 304.17 mL



For 50 g NaOH - we required 44.375 g of Cl_2

$$\text{or, number of moles of } \text{Cl}_2 \text{ required} = \frac{44.375}{71} = 0.625$$



$$\therefore \text{Amount of } \text{MnO}_2 \text{ required} = 0.625 \times 87 = 54.38 \text{ g}$$

$$\text{Amount of HCl required} = 4 \times 0.625 \times 36.5 = 91.25 \text{ g}$$

$$\text{or, Volume of HCl required} = \left(\frac{91.25}{300} \times 1000 \right) \text{ mL} = 304.166 \text{ mL}$$