Date Planned : __ / __ / __	Daily Tutorial Sheet-15	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level-3	Exact Duration :_____

159. Mg can reduce NO_3^- to NH_3 in basic medium.

$NO_3^- + Mg\ (s) + H_2O \rightarrow Mg(OH)_2(s) + OH\ (aq.) + NH_3(g)$

A 25.0 mL sample of NO_3^- solution was treated with Mg. The $NH_3(g)$ was passed into 50 mL of 0.15 N HCl. The excess of HCl required 32.10 mL of 0.10 g NaOH for neutralization. What was the molarity of NO_3^- ions in the original sample?

160. 30 mL of a solution containing 9.15 gm/litre of an oxalate $K_xH_y(C_2O_4)_z \cdot nH_2O$ are required for titrating 27 mL of 0.12 N NaOH and 36 mL of 0.12 N $KMnO_4$ separately. Calculate x, y, z and n. Assume all H atoms (except H_2O) are replaceable and x, y, z are in the simple ratio of gm atoms.

161. How many of the following are disproportionation reactions :

(1) $2NO_2 + H_2O \longrightarrow HNO_3 + HNO_2$

(2) $CH_3\dot{C}H_2 + CH_3\dot{C}H_2 \longrightarrow CH_2 = CH_2 + CH_3 - CH_3$

(3) $KBrO_3 + 5KBr + 3H_2SO_4 \longrightarrow 3Br_2 + 3K_2SO_4 + 3H_2O$

(4) $NH_4NO_3 \longrightarrow N_2O + 2H_2O$

(5) $2H_2S + SO_2 \longrightarrow 3S + 2H_2O$

(6) $4H_3PO_3 \longrightarrow 3H_3PO_4 + PH_3$

(7) $C_6H_5COCHO + KOH \longrightarrow C_6H_5CH(OH)COOK$

162. 1.0 gm of moist sample of mixture of potassium chlorate ($KClO_3$) and potassium chloride (KCl) was dissolved in water and solution was made upto 250 mL. This solution was treated with SO_2 to reduce all ClO_3^- to Cl^- and excess of SO_2 was removed by boiling. The total chloride was precipitated as silver chloride. The weight of precipitate was found to be 0.1435 gm. In another experiment, 25 mL of the original solution was heated with 30 mL 0.2 N $FeSO_4$ and unused $FeSO_4$ required 37.5 mL of 0.08 N $KMnO_4$ solutions. Calculate the molar ratio of the ClO_3^- to the Cl^- in the given mixture.

Given that,

$ClO_3^- + 6Fe^{2+} + 6H^+ \longrightarrow Cl^- + 6Fe^{3+} + 3H_2O$, $\quad 3SO_2 + ClO_3^- + 3H_2O \longrightarrow Cl^- + 3SO_4^{2-} + 6H^+$

163. Chile salt peter a source of $NaNO_3$ also contains $NaIO_3$. The $NaIO_3$ can be used as a source of iodine produced in the following reactions:

Step 1: $IO_3^- + 3HSO_3^- \longrightarrow I^- + 3H^+ + 3SO_4^{2-}$

Step 2: $5I^- + IO_3^- + 6H^+ \longrightarrow 3I_2 + 3H_2O$

One litre of chile salt peter solution containing 5.80 gm $NaIO_3$, is treated with stoichiometric quantity of $NaHSO_3$. Now additional amount of same solution is added to the reaction mixture to bring about the second reaction. How many grams of $NaHSO_3$ are required in step 1 and what additional volume of chile salt peter must be added in step 2 to bring in complete conversion of I^- to I_2?

164. How many of the following compounds contained peroxide bond?

H_2O_2, H_2SO_5, $H_2S_2O_8$, BaO_2, PbO_2, MnO_2, NO_4^+, $H_9O_4^+$, $H_7O_4^-$, $K_2Cr_2O_{12}$, C_3O_2, $C_{12}O_9$