Daily Tutorial Sheet-13	Level - 3

147.(D) In the nuclear waste.

Avg $M_C = M_{C^{12}} \times$ Mass fraction of $C^{12} + M_{C^{14}} \times$ Mass fraction of C^{14}

Avg $M_C = 12 \times \frac{48}{62} + 14 \times \frac{14}{62} = 12.4$

$M_{CH_4} = 12.4 + 4 = 16.4$

148.(A) $W_N : W_{P_2O_5} : W_{k_2O} = 30x : 10x : 10x$

$n_N : n_{P_2O_5} : n_{k_2O} = \frac{30x}{14} : \frac{10x}{142} : \frac{10x}{94}$

$n_N : n_P : n_k = \frac{3}{14} : \frac{2}{142} : \frac{2}{94} = 10 : 0.66 : 1$

149.(C) $n_{M_nO} : n_{M_2O_2} = 2 : 1$

$n_O : n_{M_n} = 2 + 1 \times 2 : 3$

$n_O : n_{M_n} = 4 : 3$

$w_O : w_{M_n} = 64 : 165$

Mass % of $M_n = \frac{165}{229} \times 100 = 72.05$

150.(B) $W_{C_u} : W_O = 2 : 1$ (in the sample)

$W_{C_u} : W_O = 127 : 16$ (in pure Cu_2O)

$\therefore$ O is in excess in the sample.

Let mass of total sample be 3x.

Then mass of pure Cu_2O in the sample $= 2x + 2x + \frac{16}{127}$

% of pure $Cu_2O = \frac{2x + \frac{2x \times 16}{127}}{3x} = \frac{286}{381} \times 100 = 75\%$

151.(A) If 164 g $NaHCO_3$ is taken in 1 L water.

After step 1 164 g of it is obtained.

After step 2 95 g of it is obtained $(164 - 69)$

% yield $= \frac{95}{164} \times 100 = 57.9\%$

152.(C) Fe_2O_3 $Fe : O = 112 : 48$

2.78 kg of $Fe \approx \frac{48}{112} \times 2.78\,\text{kg of O} \approx 1.19\,\text{kg of O}$

% gangue $\left[1 - \left(\frac{2.78 + 1.19}{5}\right)\right] \times 100 = \frac{1.13}{5} \times 100 = 20.57\%$