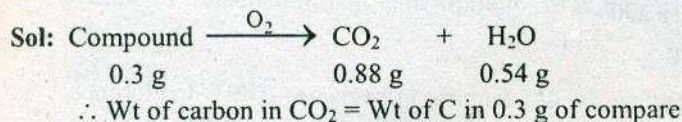


### Chapter 9: Estimation of elements in Organic compounds

**Q1.**



$$\Rightarrow \frac{12}{44} \times \frac{0.88}{100} = \text{wt of C in 0.3 g compound} = 0.24 \text{ g}$$

$$\therefore \% \text{ of C} = \frac{0.24}{0.3} \times 100 = 80\%$$

Also, Wt of H in  $\text{H}_2\text{O}$  = Wt of H in 0.3 g of compound

$$\Rightarrow \frac{2}{18} \times \frac{0.54}{100} = \text{Wt of H in 0.3 g of compound}$$

$$\Rightarrow 0.06 \text{ g} = \text{Wt of H in 0.3 g of compound.}$$

$$\therefore \% \text{ of H} = \frac{0.06}{0.3} \times 100 = 20\%$$

**Ans**

**Q2.**



Mass of C in 0.2475 g of compound

$$= \text{mass of C in 0.495 g of } \text{CO}_2 = \frac{12}{44} \times 0.495 \text{ g}$$

$$\therefore \% \text{ of C} = \frac{\frac{12}{44} \times 0.495}{0.2475} \times 100 = 54.54\%$$

Again mass of H in 0.2475 g of compound

$$= \text{mass of H in 0.2025 g of } \text{H}_2\text{O} = \frac{2}{18} \times 0.2025 \text{ g}$$

$$\therefore \% \text{ of H} = \frac{\frac{2}{18} \times 0.2025}{0.2475} \times 100 = 9.2\%$$

$$\therefore \% \text{ of oxygen} = 100 - (\% \text{ C} + \% \text{ H}) = 100 - (54.54 + 9.2) = 36.34\% \quad \text{Ans}$$

**Q3.**



$$0.206 \text{ g}$$

$$V = 18.8 \text{ mL}$$

$$T = 17^\circ\text{C} = 290 \text{ K}$$

$$P = 756 \text{ mm of Hg} = \frac{756}{760} \text{ atm}$$

$$\text{Vapour tension of substance} = 14.5 \text{ mm of Hg}$$

$\therefore$  Actual pressure exerted by  $\text{N}_2$

$$= 756 - 14.5 = 741.5 \text{ mm of Hg}$$







$$\therefore \text{mmoles remained in 1 lit} = 40 \times \text{mmoles of H}_2\text{SO}_4 \text{ in 25 mL} = 40 \times \left( \frac{25.5 \times \frac{1}{10} \times 1}{2} \right) = 51$$

$\therefore$  mmole of  $\text{H}_2\text{SO}_4$  remained in original 250 mL solution = 51

$\therefore$  mmole of  $\text{NH}_3$  = mmole of  $\text{H}_2\text{SO}_4$  used in this reaction

$$= 250 \times \frac{1}{2} \times 2 - 51 = 250 - 51 = 199$$

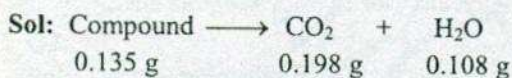
$\therefore$  mmole of N = mmole of  $\text{NH}_3$  = 199

$\therefore$  Wt of N =  $199 \times 10^{-3} \times 14 = 2.786 \text{ g}$

$\therefore$  Percentage of N =  $\frac{2.786}{1393} \times 100 = 20\%$

Ans

**Q7.**

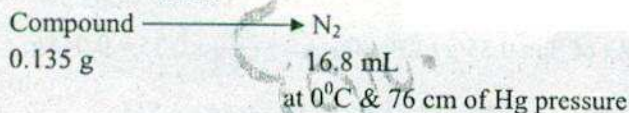


$\therefore$  Wt of C in 0.135 g of compound = Wt of C in 0.198 g of  $\text{CO}_2 = \frac{12}{44} \times 0.198 \text{ g} = 0.054 \text{ g}$

$\therefore$  % of C =  $\frac{0.054 \text{ g}}{0.135 \text{ g}} \times 100 = 40\%$

Wt of H in 0.135 g of compound = Wt of H in 0.108 g of  $\text{H}_2\text{O} = \frac{2}{18} \times 0.108 = 0.012 \text{ g}$

$\therefore$  % of H =  $\frac{0.012}{0.135} \times 100 = 8.89\%$



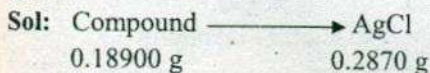
$$\text{Moles of N}_2 = \frac{16.8}{22400} = 7.5 \times 10^{-4}$$

$\therefore$  Wt of  $\text{N}_2 = 7.5 \times 10^{-4} \times 28 = 0.021 \text{ g}$

$\therefore$  % of  $\text{N}_2 = \frac{0.021}{0.135} \times 100 = 15.56\%$

$\therefore$  % of oxygen =  $100 - (\% \text{C} + \% \text{H}_2 + \% \text{N}_2) = 100 - (40 + 8.89 + 15.56) = 35.56\%$  Ans

**Q8.**



$\therefore$  Wt of Cl in 0.1890 compound = Wt of Cl in 0.2879 g of  $\text{AgCl} = \frac{35.5}{143.5} \times 0.287 \text{ g}$

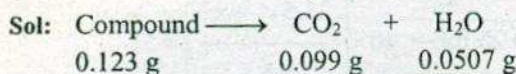
Wt of Cl in 0.189 g compound = 0.071 g

$\therefore$  % of Cl in the compound =  $\frac{0.071}{0.189} \times 100 = 37.56\%$

Ans



**Q 9.**



Wt of C in 0.123 g in compound

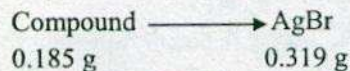
$$= \text{Wt of C in 0.099 g of } \text{CO}_2 = 0.099 \times \frac{12}{44} = 0.0279 \text{ g}$$

$$\therefore \% \text{ of carbon} = \frac{0.027}{0.123} \times 100 = 21.95\% \quad \text{Ans}$$

Wt of H in 0.123 g of compound

$$= \text{wt of H in 0.05079 g of } \text{H}_2\text{O} = \frac{2}{18} \times 0.0507 \text{ g} = 5.63 \times 10^{-3}$$

$$\therefore \% \text{ of H} = \frac{5.63 \times 10^{-3}}{0.123} \times 100 = 4.48\% \quad \text{Ans}$$

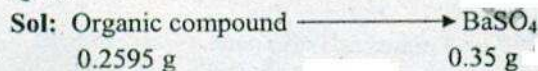


Wt of Br in 0.185 g of compound

$$= \text{Wt of Br in 0.319 g of AgBr} = \frac{80}{188} \times 0.319 \text{ g} = 0.1357 \text{ g}$$

$$\therefore \% \text{ of compound} = \frac{0.1357}{0.185} \times 100 = 73.36\% \quad \text{Ans}$$

**Q10.**



$$\text{Wt of S in 0.2595 g of compound} = \text{Wt of S in 0.35 g of } \text{BaSO}_4 = \frac{32}{233.3} \times 0.35 = 0.048 \text{ g}$$

$$\therefore \% \text{ of S} = \frac{0.048}{0.2595} \times 100 = 18.5\% \quad \text{Ans}$$

**Q11.**



Wt of P in 1.5 g of compound = wt of p in 2.509 g of  $\text{Mg}_2\text{P}_2\text{O}_7$

$$= \frac{2 \times 31}{(48 + 62 + 16 \times 7)} \times 2.509 = \frac{62}{222} \times 2.509 = 0.7006 \text{ g}$$

$$\therefore \% \text{ of P} = \frac{0.7006 \text{ g}}{1.5 \text{ g}} \times 100 = 46.71\% \quad \text{Ans}$$