





Q36

$$n(\text{CO}_2) = \frac{m}{M} = \frac{2.85}{44}$$

$$n(\text{CO}_2) = n(\text{C}) = 0.0647 \text{ mol} \quad \% \text{C} = \frac{0.0647 \times 12}{2.3} = 33.7\%$$
$$= 0.7764 \text{ g}$$

$$n(\text{H}_2\text{O}) = \frac{m}{M} = \frac{0.874}{18}$$

$$n(\text{H}_2\text{O}) \times 2 = n(\text{H}) = 0.04855 \times 2 = 0.09711 \text{ mol}$$
$$= 0.09711 \text{ g}$$

$$n(\text{H}_2\text{SO}_4)_{\text{total}} = CV = 1.35 \times (25 \times 10^{-3}) = 0.03375 \text{ mol}$$
$$\% \text{H} = \frac{0.09711}{2.3} = 4.2\%$$

$$n(\text{NaOH}) = CV = 0.1186 \times (15.4 \times 10^{-3}) = 0.002864 \text{ mol}$$

$$n(\text{NaOH}) \times \frac{1}{2} = n(\text{H}_2\text{SO}_4)_{\text{reacted}}$$
$$= 0.001432 \text{ mol}$$
$$n(\text{H}_2\text{SO}_4)_{\text{excess}}$$

$$n(\text{H}_2\text{SO}_4) = 0.03375 - 0.001432 = 0.03232 \text{ mol}$$

$$n(\text{H}_2\text{SO}_4) \times 2 = 0.06464 \text{ mol } n(\text{NH}_3)$$

$$n(\text{NH}_3) = n(\text{N}) = 0.06464 \text{ mol}$$

$$m(\text{N}) = 0.06464 \times 14$$

$$= 0.9044 \text{ g}$$

$$\% \text{N} = \frac{0.9044}{2.3} = 39.3\%$$

$$2.70 \text{ g} = m(\text{C}) + m(\text{H}) + m(\text{N})$$

$$0.776 \text{ g} + 0.0971 \text{ g} + 0.904 \text{ g}$$

$$\% \text{O} = 100 - (33.7 + 4.2 + 39.3)$$

$$\% \text{O} = 22.8\%$$

$$m(\text{O}) = 0.522 \text{ g}$$

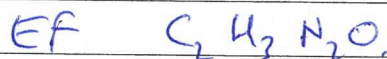
$$n(\text{O}) = \frac{0.522}{16} = 0.03263 \text{ mol}$$

by %	C	H	N	O
	33.7	4.2	39.3	22.8
	$\frac{33.7}{12}$	$\frac{4.2}{1}$	$\frac{39.3}{14}$	$\frac{22.8}{16}$
	$\frac{2.808}{1.425} = 2$	$\frac{4.2}{1.425} = 3$	$\frac{2.807}{1.425} = 2$	$\frac{1.425}{1.425} = 1$

by ratio C H N O

$\frac{0.0647}{0.03263}$	$\frac{0.09711}{0.03262}$	$\frac{0.0646}{0.03263}$	$\frac{0.03263}{0.03262}$
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2 3 2 1



b)  $PV = nRT$

$$242 \times 0.633 = n \times 8.314 \times (865 + 273)$$

$$n = 0.01619 \text{ mol}$$

$$n = \frac{M}{M_r} = M_r \frac{2.30}{0.01619} = 142$$

$$M \text{ of EF} = 24 + 3 + 28 + 16 = 71$$

$$\frac{M_r}{EF} = \frac{142}{71} = 2$$

