

In Duma's method of estimation of nitrogen, 0.1840 g of an organic compound gave 30 mL of nitrogen collected at 287 K and 758 mm of Hg pressure. The percentage composition of nitrogen in the compound is \_\_\_\_\_. (Round off to the Nearest Integer). [Given : Aqueous tension at 287 K = 14 mm of Hg]

## Answer

Correct Answer is **19**

## Explanation

Aqueous tension at 287 K = 14 mm of Hg.

Hence actual pressure = (758 - 14)  
= 744 mm of Hg.

$$\text{Moles of } N_2 = \frac{(758-14)}{760} \times \frac{30 \times 10^{-3}}{0.0821 \times 287}$$

$$= 1.246 \times 10^{-3} \text{ mol}$$

$$\text{mass of } N_2 = 1.246 \times 10^{-3} \times 28$$

$$\text{mass \% of } N_2 = \frac{\text{mass of 'N'}}{\text{total mass}} \times 100$$

$$= \frac{1.246 \times 28 \times 10^{-3}}{0.184} \times 100$$

$$= \frac{124.6 \times 28}{0.184} \% = 18.96\%$$

$$\simeq 19\%$$