

3.50 A 75.69% C, 8.8% H, 15.51% O

$\frac{75.69 \text{ g C}}{12 \text{ g C}} = 6.31 \text{ mole C} = \frac{6.31}{0.97} = 6.5 = \textcircled{13}$

$\frac{8.8 \text{ g H}}{1 \text{ g H}} = 8.8 \text{ mole H} = \frac{8.8}{0.97} = 9.07 = \textcircled{18}$

$\frac{15.51 \text{ g O}}{16 \text{ g O}} = 0.97 \text{ mole O} = \frac{0.97}{0.97} = 1 = \textcircled{2}$

Molar mass = 206 g/mole
 EMP. FORM $\text{C}_{13}\text{H}_{18}\text{O}_2$
 206 g/mole
 Emp. Form
 Molar. Form.

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Isopropyl Alcohol (0.255g) $\text{C}_x\text{H}_y\text{O}_z$ (0.56g CO_2 , 0.306g H_2O) combustion products.

Find Empirical Formula

$\text{C}_x\text{H}_y\text{O}_z + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$

(Find) \Rightarrow mole C, mole H, mole O

$\frac{0.56 \text{ g CO}_2}{44 \text{ g CO}_2} = 0.013 \text{ mole C}$
 $\frac{0.306 \text{ g H}_2\text{O}}{18 \text{ g H}_2\text{O}} = 0.034 \text{ mole H}$
 $\frac{0.08 \text{ mole H}}{1 \text{ g H}} = 0.034 \text{ mole H}$

Total mass $\text{C}_x\text{H}_y\text{O}_z = 0.255 \text{ g}$
 $- 0.156 \text{ g C}$
 $- 0.034 \text{ g H}$
 $\hline 0.065 \text{ g O}$

$\frac{0.065 \text{ g O}}{16 \text{ g O}} = 0.004 \text{ mole O}$

$\frac{0.013}{0.004} \quad \frac{0.034}{0.004} \quad \frac{0.004}{0.004}$
 $3.25 : 8.5 : 1$
 $13 : 34 : 4 \quad \times 4$
 $\text{C}_{13}\text{H}_{34}\text{O}_4$

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