

## Molecular Formula

### Practice Problems

①  $\text{CH}_2\text{N}$

$$1 \times \text{C} = 1 \times 12.01 \text{ g/mol} = 12.01 \text{ g/mol}$$

$$2 \times \text{H} = 2 \times 1.01 \text{ g/mol} = 2.02 \text{ g/mol}$$

$$1 \times \text{N} = 1 \times 14.01 \text{ g/mol} = 14.01 \text{ g/mol}$$

$$\underline{28.04 \text{ g/mol}}$$

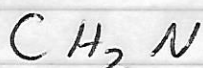
Empirical

$$28.04 \text{ g/mol}$$

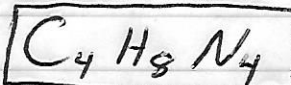
$$\xrightarrow{\times 4}$$

Molecular

$$112.16 \text{ g/mol}$$



$$\xrightarrow{\times 4}$$



②  $\text{CH}_3\text{O}$

$$1 \times \text{C} = 1 \times 12.01 \text{ g/mol} = 12.01 \text{ g/mol}$$

$$3 \times \text{H} = 3 \times 1.01 \text{ g/mol} = 3.03 \text{ g/mol}$$

$$1 \times \text{O} = 1 \times 16.00 \text{ g/mol} = 16.00 \text{ g/mol}$$

$$\underline{31.04 \text{ g/mol}}$$

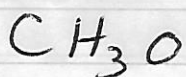
Empirical

$$31.04 \text{ g/mol}$$

$$\xrightarrow{\times 2}$$

Molecular

$$62 \text{ g/mol}$$

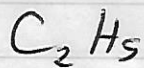


$$\xrightarrow{\times 2}$$



$$\textcircled{3} \frac{82.5 \text{ g C}}{12.01 \text{ g/mol}} = 6.87 \text{ mol C}$$

$$\frac{17.5 \text{ g H}}{1.01 \text{ g/mol}} = 17.33 \text{ mol H}$$



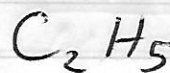
$$2 \times \text{C} = 2 \times 12.01 \text{ g/mol} = 24.02 \text{ g/mol}$$

$$5 \times \text{H} = 5 \times 1.01 \text{ g/mol} = 5.05 \text{ g/mol}$$

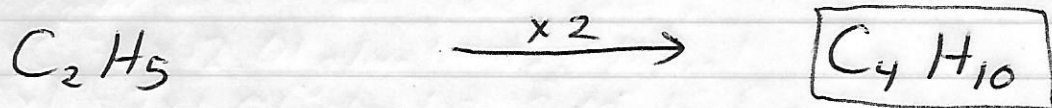
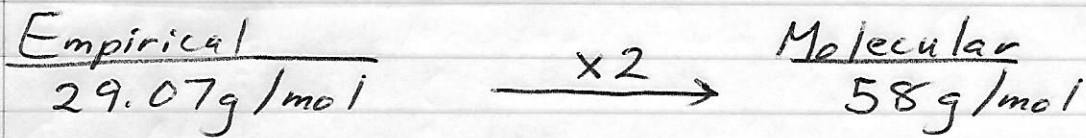
$$\underline{29.07 \text{ g/mol}}$$

$$\text{C}_{\frac{6.87}{6.87}} \text{H}_{\frac{17.33}{6.87}}$$

$$\text{C}_{1.00} \text{H}_{2.52}$$



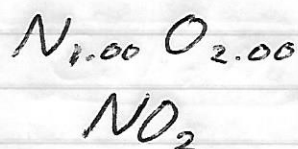
$$\curvearrowright \times 2$$



$$\textcircled{4} \frac{30.4 \text{ g N}}{14.01 \text{ g/mol}} = 2.17 \text{ mol N}$$

$$\begin{array}{r} \text{N}_{2.17} \quad \text{O}_{4.35} \\ \hline 2.17 \quad 2.17 \end{array}$$

$$\frac{69.6 \text{ g O}}{16.00 \text{ g/mol}} = 4.35 \text{ mol O}$$



$$1 \times \text{N} = 1 \times 14.01 \text{ g/mol} = 14.01 \text{ g/mol}$$

$$2 \times \text{O} = 2 \times 16.00 \text{ g/mol} = 32.00 \text{ g/mol}$$

$$\underline{46.01 \text{ g/mol}}$$

