

Empirical Formula

Empirical Formulas are the lowest whole-number-ratio of elements in a compound.

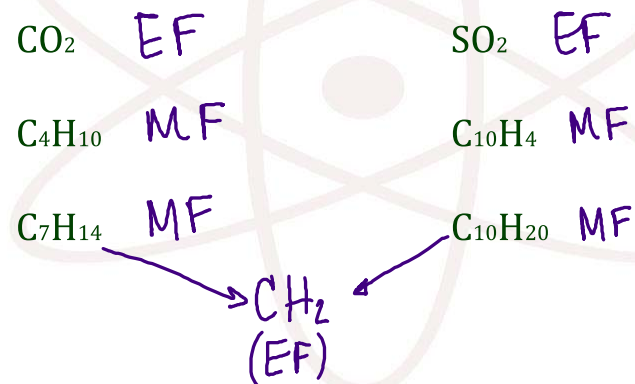
E.F. are calculated by using the percent composition.



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Empirical Formula

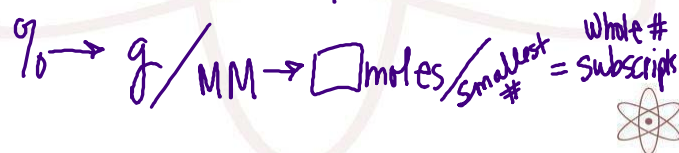
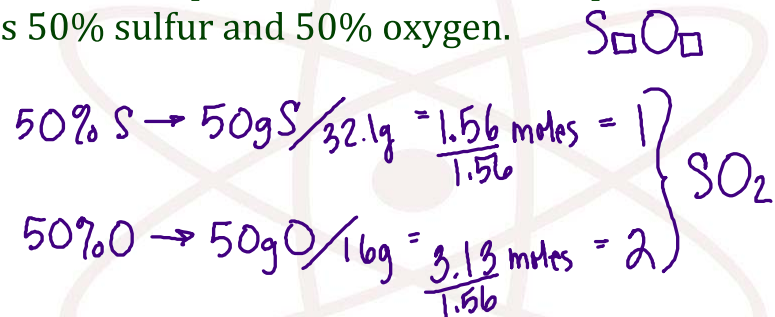
Empirical Formulas are the lowest whole-number-ratio of elements in a compound.



2

Empirical Formula

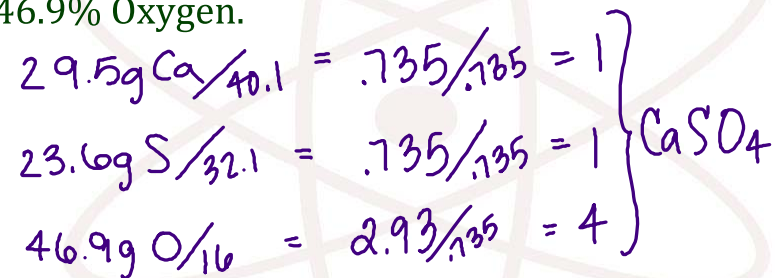
Find the empirical formula of a compound that is 50% sulfur and 50% oxygen.



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Empirical Formula

Find the empirical formula of a compound that is 29.5% Calcium, 23.6% Sulfur, and 46.9% Oxygen.



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Empirical Formula

Find the empirical formula of a compound that is 70% Iron and 30% Oxygen.

$$70\text{g Fe} / 55.9 = 1.25 / 1.25 = 1 \times 2 = 2$$

$$30\text{g O} / 16 = 1.88 / 1.25 = 1.5 \times 2 = 3$$



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Molecular Formula

A Molecular Formula is determined by calculating the Empirical Formula first. Molecular Formulas are NOT NECESSARILY the lowest-whole-number ratio.



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Molecular Formula

A substance is 40% Carbon, 6.7% Hydrogen, and 53.3% Oxygen. It's molar mass is 180 g. Find the empirical formula and the molecular formula.

$$\left. \begin{array}{l} 40\text{g C} / 12 = 3.33 / 3.33 = 1 \\ 6.7\text{g H} / 1 = 6.7 / 3.33 = 2 \\ 53.3\text{g O} / 16 = 3.33 / 3.33 = 1 \end{array} \right\} \text{CH}_2\text{O}$$



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Formula Practice

$$\text{M. Mass} = 180\text{g} \quad \text{MF?}$$

$$\frac{\text{EF}}{\text{E. Mass}} = \frac{\text{MF}}{\text{M. Mass}}$$

$$\text{look up} \rightarrow \frac{\text{CH}_2\text{O} \times 6}{30 \times 6} = \frac{\text{C}_6\text{H}_{12}\text{O}_6}{180}$$



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Formula Practice

