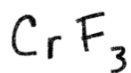


W-GC General Chemistry 12/15



Find the molar mass and percent composition

$\text{Cr}: 1 * 51.996 = [51.996]$

$\text{F}: 3 * 18.998 = 56.994$

$\hline 108.99$

$\frac{51.996}{108.99} = .477 * 100\%$

$\text{Cr}: 47.7\%$

$\text{F}: 52.3\%$

molar mass

How many moles of Na_3PO_4 are there in

342 g of Na_3PO_4

$\text{Na}: 3 * 22.99 = 68.97$

$\text{P}: 1 * 30.974 = 30.974$

$\text{O}: 4 * 15.999 = + 63.996$
 $\hline 163.96 \text{ g}$

$342 \text{ g } \text{Na}_3\text{PO}_4 * \frac{1 \text{ mol.}}{163.96 \text{ g}}$

$2.08 \text{ mol } \text{Na}_3\text{PO}_4$

Empirical Formula for molecule containing

65.5% carbon
5.5% hydrogen
29.0% oxygen

Assume we have
100 grams of the
substance

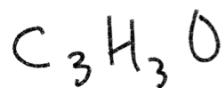
$$65.5\% \text{ C} \rightarrow \frac{65.5 \text{ g C}}{12.011 \text{ g/mol}} = \frac{5.45 \text{ mol}}{1.81} = \boxed{3}$$

$$5.5\% \text{ H} \rightarrow \frac{5.5 \text{ g H}}{1.008 \text{ g/mol}} = \frac{5.45 \text{ mol}}{1.81} = \boxed{3}$$

$$29.0\% \text{ O} \rightarrow \frac{29 \text{ g O}}{15.999 \text{ g/mol}} = \frac{1.81 \text{ mol}}{1.81} = \boxed{1}$$

empirical formula: $\text{C}_3\text{H}_3\text{O}$

Molar mass for the compound is $\boxed{110 \text{ g/mol}}$



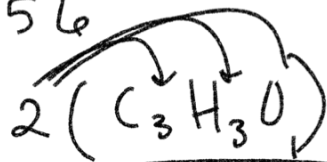
$$\text{C} : 3 * 12.011 \text{ g} = 36.033 \text{ g/mol}$$

$$\text{H} : 3 * 1.008 \text{ g} = 3.024 \text{ g/mol}$$

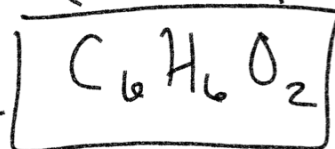
$$\text{O} : 1 * 15.999 \text{ g} = 15.999 \text{ g/mol}$$

$$\underline{55.056}$$

$$110 / 55.056 \approx 2$$



molecular formula



Empirical Formula

18.7% Lithium

16.3% Carbon

65.0% Oxygen

molar mass 73.8 g/mol
Part 2

empirical formula
 Li_2CO_3

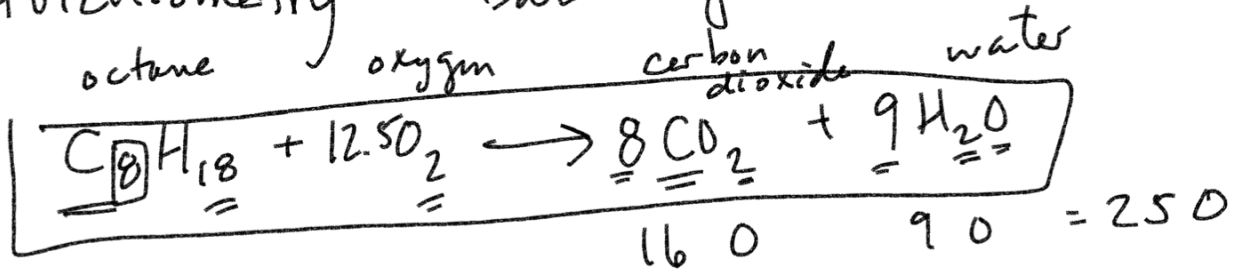
$\frac{18.7 \text{ g Li}}{6.94}$	$\frac{16.3 \text{ g C}}{12.011}$	$\frac{65.0 \text{ g O}}{15.999}$
$\frac{2.69}{1.35}$	$\frac{1.35}{1.35}$	$\frac{4.06}{1.35}$
≈ 2	1	≈ 3

Li: $2 * 6.94 = 13.88$
 C: $1 * 12.011 = 12.011$
 O: $3 * 15.999 + 47.997$

molecular formula
 Li_2CO_3

empirical molar mass $\boxed{73.88}$

Stoichiometry - Balancing



Law of conservation of matter
 matter cannot be created or destroyed

