

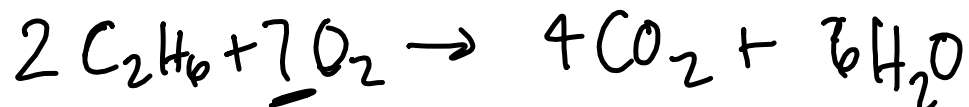
$$AM \Rightarrow Mg = 24.3 \text{ amu} \quad \begin{matrix} 24 \\ 25 \end{matrix}$$

$$^{12}C = 12.000 \text{ amu}$$

$$1.6606 \times 10^{-24} \text{ amu} = 1 \text{ g}$$

$$6.022 \times 10^{23}$$

$$\frac{1 \text{ mol Mg atom}}{1 \text{ mol}} \times \frac{24.3 \text{ amu}}{1 \text{ Mg atom}} \times \frac{1.6606 \times 10^{-24} \text{ g}}{1 \text{ amu}} \approx \frac{24.3 \text{ g}}{1 \text{ mol}}$$



100g O<sub>2</sub> → how much H<sub>2</sub>O

g O<sub>2</sub> → mols O<sub>2</sub> → mols H<sub>2</sub>O → g H<sub>2</sub>O

$$100 \cancel{\text{g O}_2} \times \frac{1 \cancel{\text{mol O}_2}}{32 \cancel{\text{g O}_2}} \times \frac{6 \cancel{\text{mols H}_2\text{O}}}{7 \cancel{\text{mol O}_2}} \times \frac{18 \cancel{\text{g H}_2\text{O}}}{1 \cancel{\text{mol H}_2\text{O}}}$$

$$\frac{10,800 \text{ g H}_2\text{O}}{224} =$$

$\text{OH}^-$ hydroxide	$\text{NO}_3^-$ <u>nitrate</u>	$\text{ClO}_3^-$ <u>chlorate</u>	$\text{CO}_3^{2-}$ <u>carbonate</u>	$\text{SO}_4^{2-}$ <u>sulfate</u>	$\text{PO}_4^{3-}$ <u>phosphate</u>
$\text{H}_2\text{O}_2$ <u>peroxide</u>	$\text{NO}_2^-$ nitrite	$\text{ClO}_2^-$ chlorite	$\text{CO}_2^{2-}$ carbonite	$\text{SO}_3^{2-}$	
$\text{MnO}_4^{2-}$ permanganate	$\text{NO}^-$ hyponitrite	$\text{ClO}^-$ hypochlorite	$\text{CO}^{2-}$	$\text{SO}_2^{2-}$	
$\text{C}_2\text{H}_3\text{O}_2^-$ acetate	$\text{NO}_4^-$ pernitrate	$\text{ClO}_4^{2-}$ perchlorate	$\text{CO}_4^{2-}$	$\text{H}^+ \text{CO}_3^{2-}$	
$\text{HC}_2\text{H}_3\text{O}_2$ acetic acid	$\text{CrO}_4^{2-}$	$\text{BrO}_4^{2-}$	$\text{H}_2\text{CO}_3$	carbonic acid	
	$\text{CrO}_3^{2-}$	$\text{BrO}_3^{2-}$			
		$\text{HNO}_3$ nitric acid			

## Percentage Composition by Mass

$$\text{Percent Comp. of element A in a compound} = \frac{\text{mass of Element A}}{\text{total mass of Compound}} \times 100$$

$$AB_2 = 100 \quad A = \frac{1 \times 50}{100} = 50\%$$

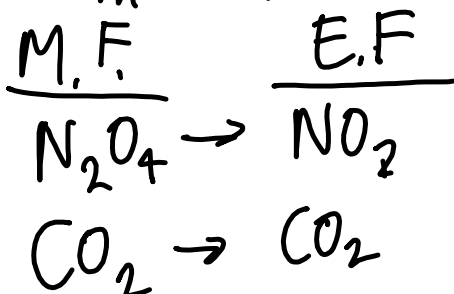
$$A = 50$$
$$B = 25$$

$$B = \frac{2 \times 25}{100} = 50\%$$

## Empirical and Molecular Formulas

Molecular Formulas = chem. formula that indicates the actual number of atoms in a compound.

Empirical Formula = chem formula that gives the relative number of each type of atom in compound.



Determining Empirical Formulas:  $\text{CO}_2$

If a compd is 73.9% Hg and 26.1% Chlorine by mass, what is its E.F.?

Assume 100 g

$$73.9 \text{ g Hg} \times \frac{1 \text{ mol Hg}}{200.59 \text{ g}} = 0.369 \text{ mol Hg} / 0.369 = 1$$

$$26.1 \text{ g Cl} \times \frac{1 \text{ mol Cl}}{35.453 \text{ g}} = 0.736 \text{ mol Cl} / 0.369 = 2$$

Determining Molecular Formula



① Determine empirical formula mass

②  $\frac{\text{Molecular Weight (Molar Mass)}}{\text{Empirical Formula Weight}} = \text{Multiplier for Subscripts}$

