

Noteset 5B (Part 1) - In Class Noteset

Introduction to Molar Mass Conversions

Using Molar Mass

Molar Mass is a conversion factor between mol_A and mass_A

A: atoms, ions (+ or -),
Compounds or molecules

$$1 \text{ mol}_A = \text{Molar Mass}_A (g)$$

$$\frac{1 \text{ mol}_A}{\text{Molar Mass}_A (g)} = \frac{\text{Molar Mass}_A (g)}{1 \text{ mol}_A}$$

$$C: \frac{12.01 g}{1 \text{ mol}} = \frac{1 \text{ mol}}{12.01 g}$$

$$MM_A = \text{Molar Mass}_A$$

Molar Mass Conversions

mol_A → mass_A

start _n (mol)	MM _A (g)
	1 mol _A

mass_A → mol_A

start _n (g)	1 mol _A
	MM _A (g)

T-chart + Answer Requires : quantity unit label
MM = Molar Mass (g)

Molar Conversion Examples

Convert 152.6 g Ca to mol Ca

$$MM_{Ca} = 40.08 \text{ g/mol}$$

$$\begin{array}{r|l} 152.6 \text{ g Ca} & 1 \text{ mol Ca} \\ \hline & 40.08 \text{ g Ca} \end{array}$$

Round to 2 after
0-4 : same
5-9 : round up
(3.80738...)

$$\frac{152.6 \text{ g Ca} \times 1 \text{ mol Ca}}{40.08 \text{ g Ca}} = 3.81 \text{ mol Ca}$$

Convert 1.92 mol Al to mass Al

$$MM_{Al} = 26.98 \text{ g/mol}$$

$$\begin{array}{r|l} 1.92 \text{ mol Al} & 26.98 \text{ g Al} \\ \hline & 1 \text{ mol Al} \end{array}$$

Round to 2 after
0-4 : same
5-9 : round up
(51.8016)

$$\frac{1.92 \text{ mol Al} \times 26.98 \text{ g Al}}{1 \text{ mol Al}} = 51.80 \text{ g Al}$$

Applying Molar Mass in Conversions

<p>Molar Ratio</p> <p>start</p>	$\frac{\text{MM}}{\text{quantity}} \frac{\text{g}_A}{\text{unit}} = \frac{1}{\text{quantity}} \frac{\text{mol}_A}{\text{unit}} \frac{\text{label}}{\text{label}}$	$\frac{1 \text{ mol}_A}{\text{MM g}_A} = \frac{\text{MM g}_A}{1 \text{ mol}_A}$
<p>2.00 mol Na</p> <p>quantity unit label</p>	$\frac{2.00 \text{ mol Na}}{\text{MM} = \text{molar mass}}$	$\frac{\text{end (g)}}{(\text{MM}) \text{ mass Na}} \cdot \frac{\text{start mol Na}}{(\text{mass}) \text{ g Na}}$
<p>Convert to mass Na</p> <p>problem</p>	<p>unit label</p> <p>Solve (end)</p>	<p>=</p>