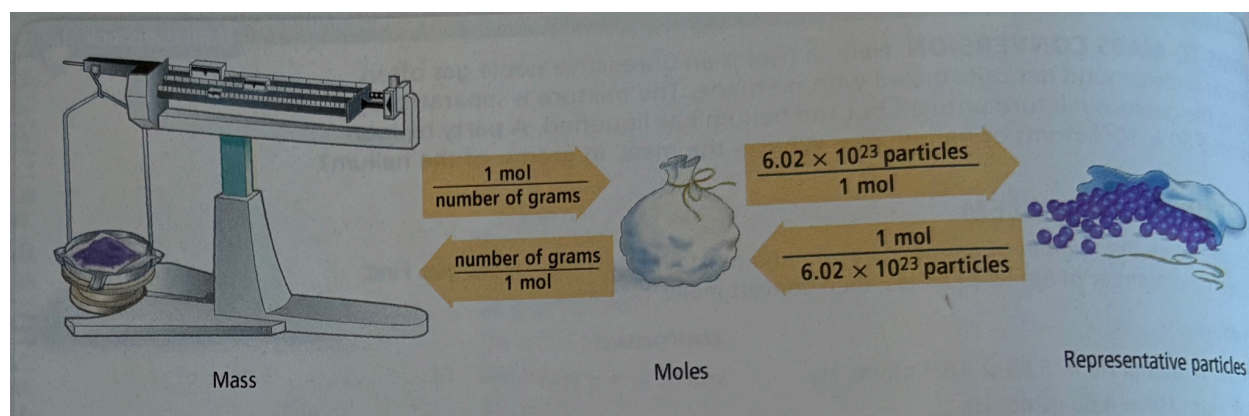


Chemistry Unit 4 Notes

Chapter 10 Notes: The Mole



Moles to Particles Example

Particles to Moles Example

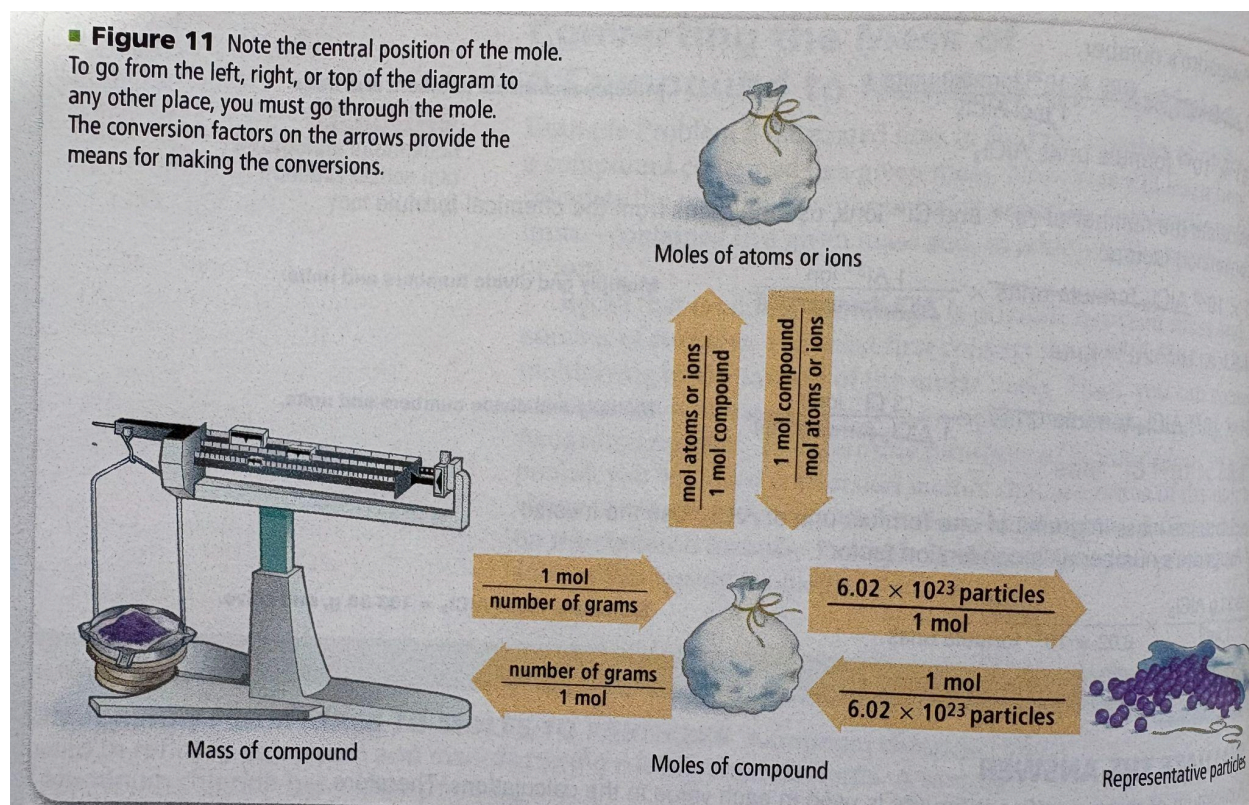
Moles to Mass Example

Mass to Moles Example

Mass to Atoms Example

Atoms to Mass Example

■ **Figure 11** Note the central position of the mole. To go from the left, right, or top of the diagram to any other place, you must go through the mole. The conversion factors on the arrows provide the means for making the conversions.



Mole Relationships from Chemical Formulas

Molar Mass of Compound Example

Mole to Mass for Compounds Example

Mass to Mole for Compounds Example

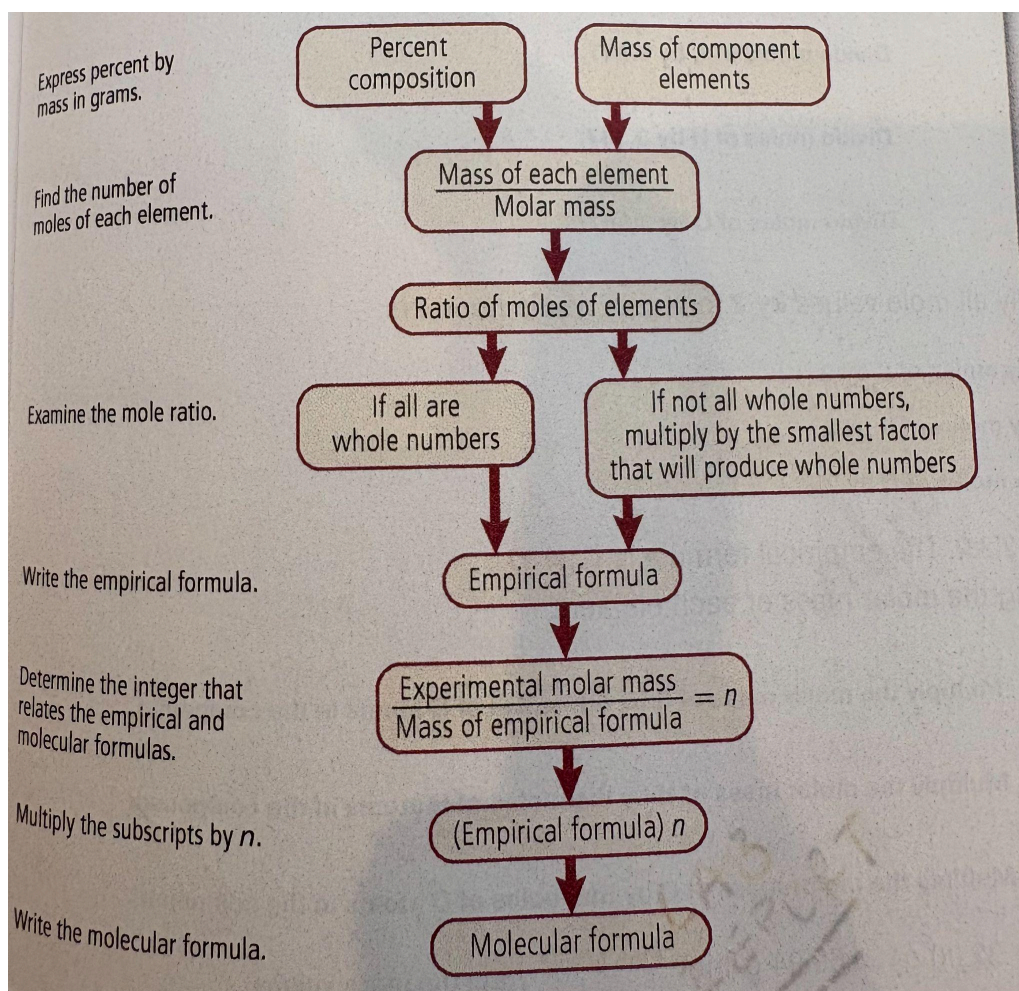
Mass to Mole to Particles of Compound Example

PERCENT BY MASS USING EXPERIMENTAL DATA

$$\text{Percent by mass} = \frac{\text{mass of element}}{\text{Mass of compound}} \times 100$$

PERCENT BY MASS FROM THE CHEMICAL FORMULA

$$\text{Percent by mass} = \frac{\text{mass of element in 1 mol of compound}}{\text{molar mass of compound}} \times 100$$



Calculate Percent Composition Sample Problem

Calculate Empirical Formula Sample Problem

Calculate Molecular Formula Sample Problem



Empirical vs Molecular Formula



Empirical

Simplest whole number ratio of elements



Molecular

Actual whole number ratio
Multiple of Empirical



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Stoichiometry Made Easy



How many slices of bread do you need to make 7 grilled cheese sandwiches?

$$7 \text{ [sandwich]} \left(\frac{2 \text{ [bread slice] }}{1 \text{ [sandwich] }} \right) = 14 \text{ [bread slice] }$$



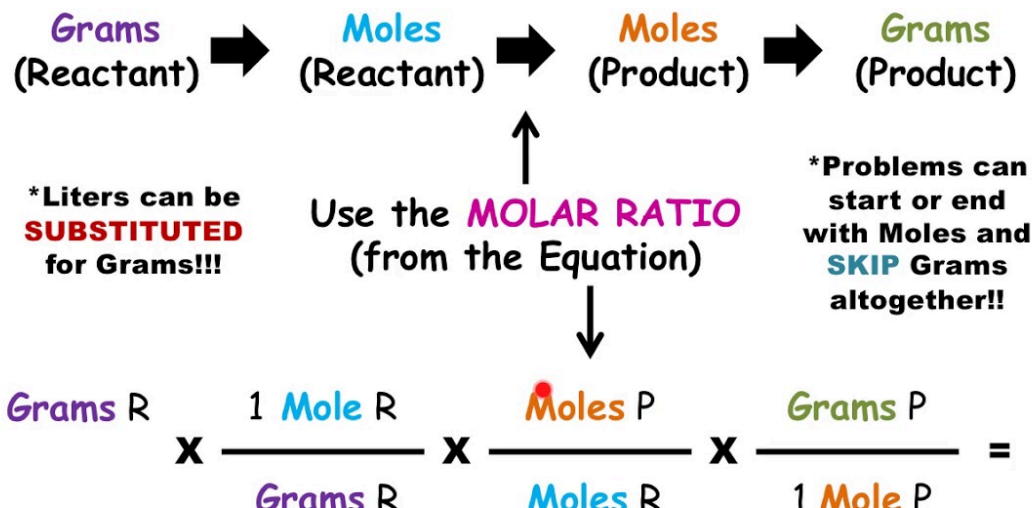
The balanced equation is our conversion factor

Mole Ratios

Stoichiometry Mass to Mass

Stoichiometry Problems

- Always follow this same basic format...



Finding Limiting Reactant

Amount of Excess Reactant

Percent Yield

$$\text{percent yield} = \frac{\text{actual yield}}{\text{theoretical yield}} \times 100\%$$

Actual yield is the amount of product obtained from lab data.

Theoretical yield is the amount of product obtained from stoichiometry.