

What Is a Compound Made Of?

The Analytical Breakdown of Chemical Proportions



The Core Analytical Tool



Total mass of a specific element in one mole of the compound.

Converts the fractional ratio into a percentage out of 100.

$$\text{Mass \%} = \frac{(\text{mass of element})}{\text{molar mass}} \times 100$$

Total mass of one mole of the entire compound.

This formula quantifies exactly how much of a compound's mass is contributed by each constituent element.

Case Study 1: The Anatomy of Water

H₂O (Molar mass = 18.02 g)

Hydrogen (H)

11.18%

$(2.016 \text{ g} / 18.02 \text{ g}) \times 100$

Oxygen (O)

88.79%

$(16.00 \text{ g} / 18.02 \text{ g}) \times 100$



You've Learned the Theory. Let's Test Them Now.

$$E=mc^2$$



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Key Highlights

- » Free Study Material, Videos & Infographics
- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter



Case Study 2: The Anatomy of Ethanol

$\text{C}_2\text{H}_5\text{OH}$ (Molar mass = 46.068 g)

Carbon (C)

52.14%

$$(24.02 \text{ g} / 46.068 \text{ g}) \times 100$$

Oxygen (O)

34.73%

$$(16.00 \text{ g} / 46.068 \text{ g}) \times 100$$

Hydrogen (H)

13.13%

$$(6.048 \text{ g} / 46.068 \text{ g}) \times 100$$

Practical Application 1: Purity Determination



Expected Theoretical Values

C = 52.14%

O = 34.73%

H = 13.13%

Match Confirmed

Experimental Laboratory Results

C = 50.10%

O = 35.80%

H = 14.10%

Deviations Detected

Alert: Deviations from theoretical mass percentages indicate the presence of impurities or a completely different chemical compound.

Practical Application 2: Formula Determination



Key Takeaway: Percentage composition leads directly to the empirical formula.

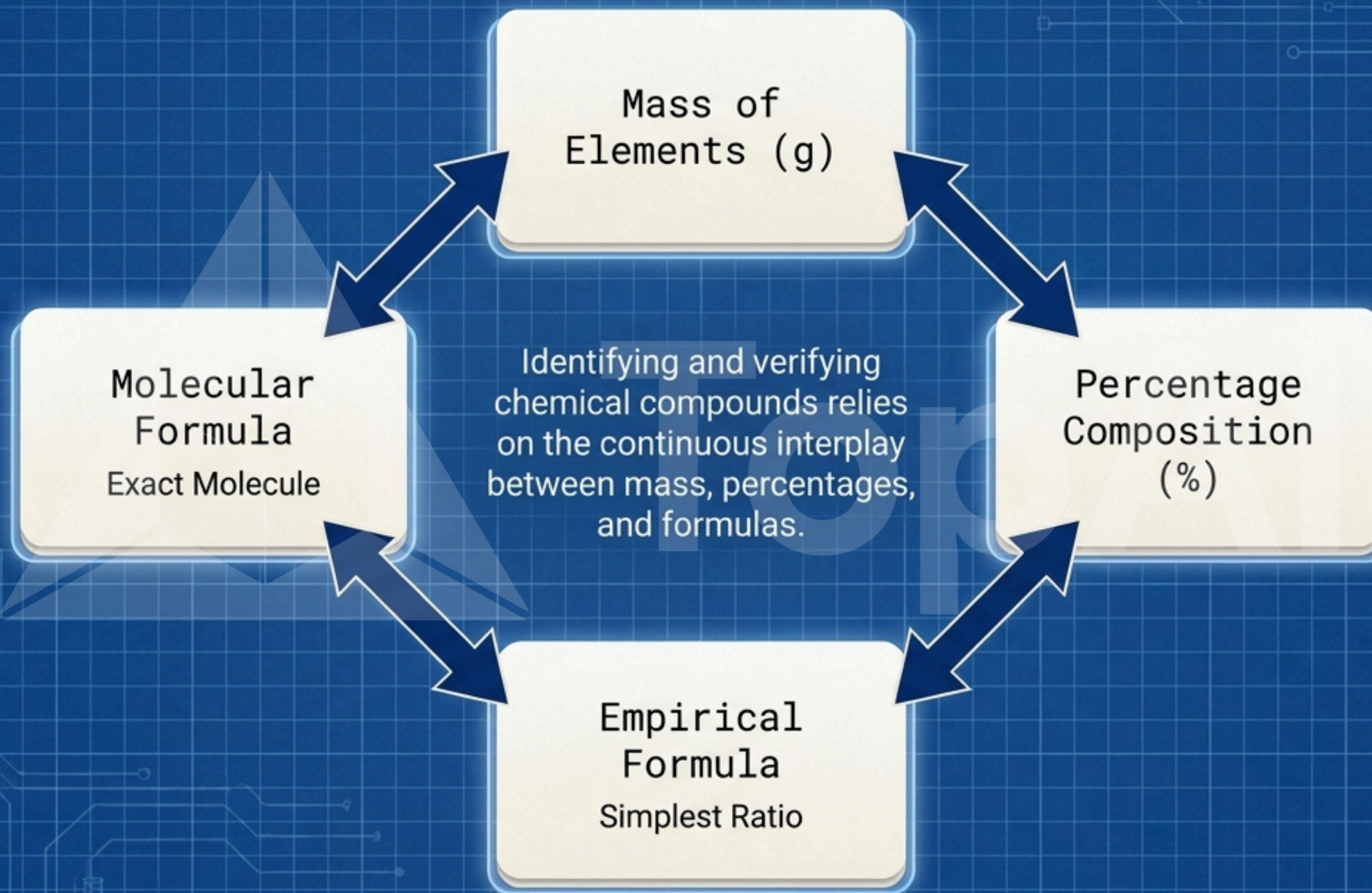
**Experimental
% Composition**

**Convert to
Moles**
(Divide by atomic mass)

**Determine
Simple Ratio**
(Divide by smallest
mole value)

**Empirical
Formula**
(Simplest whole-number
ratio of atoms)

The Analytical Workflow





You've Learned the Theory.

Now Let's Test It.

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