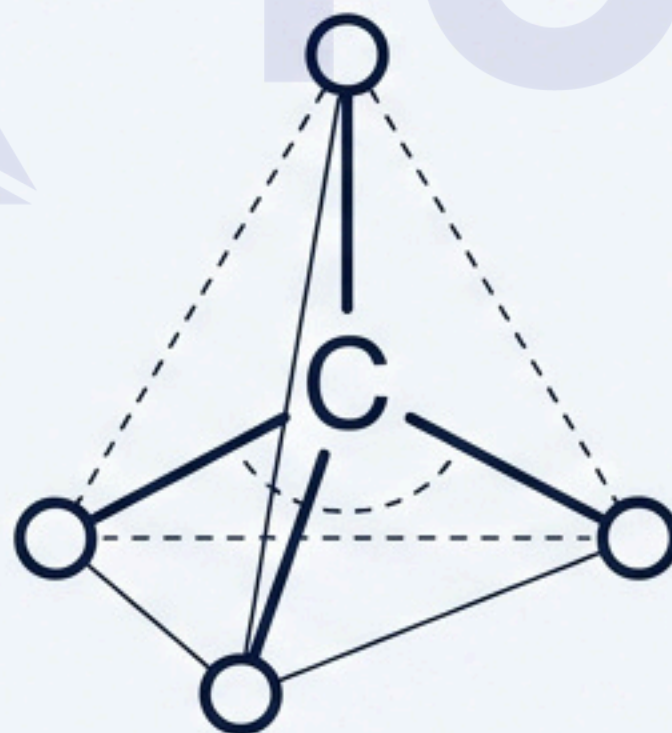


Stereoisomerism

Beyond 2D: When connectivity stays the same, but spatial arrangement changes everything.



The Two Branches of Isomerism

Isomers share the exact same molecular formula, but their architectures diverge in two distinct ways.

Structural Isomerism

Different Connectivity.

Atoms are linked together in a completely different sequence (e.g., changes in the main chain, position, or functional groups).

Stereoisomerism

Same Connectivity.

Atoms are linked in the **exact same sequence**. The unique identity of the molecule comes entirely from how its atoms are arranged in 3D space.

EXAM FOCUS

If you can trace the exact same path of bonds between atoms, but the molecule behaves differently, you are looking at stereoisomers.



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

$$E=mc^2$$



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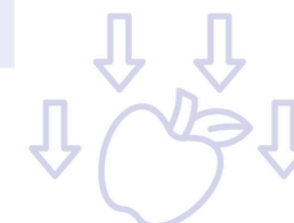
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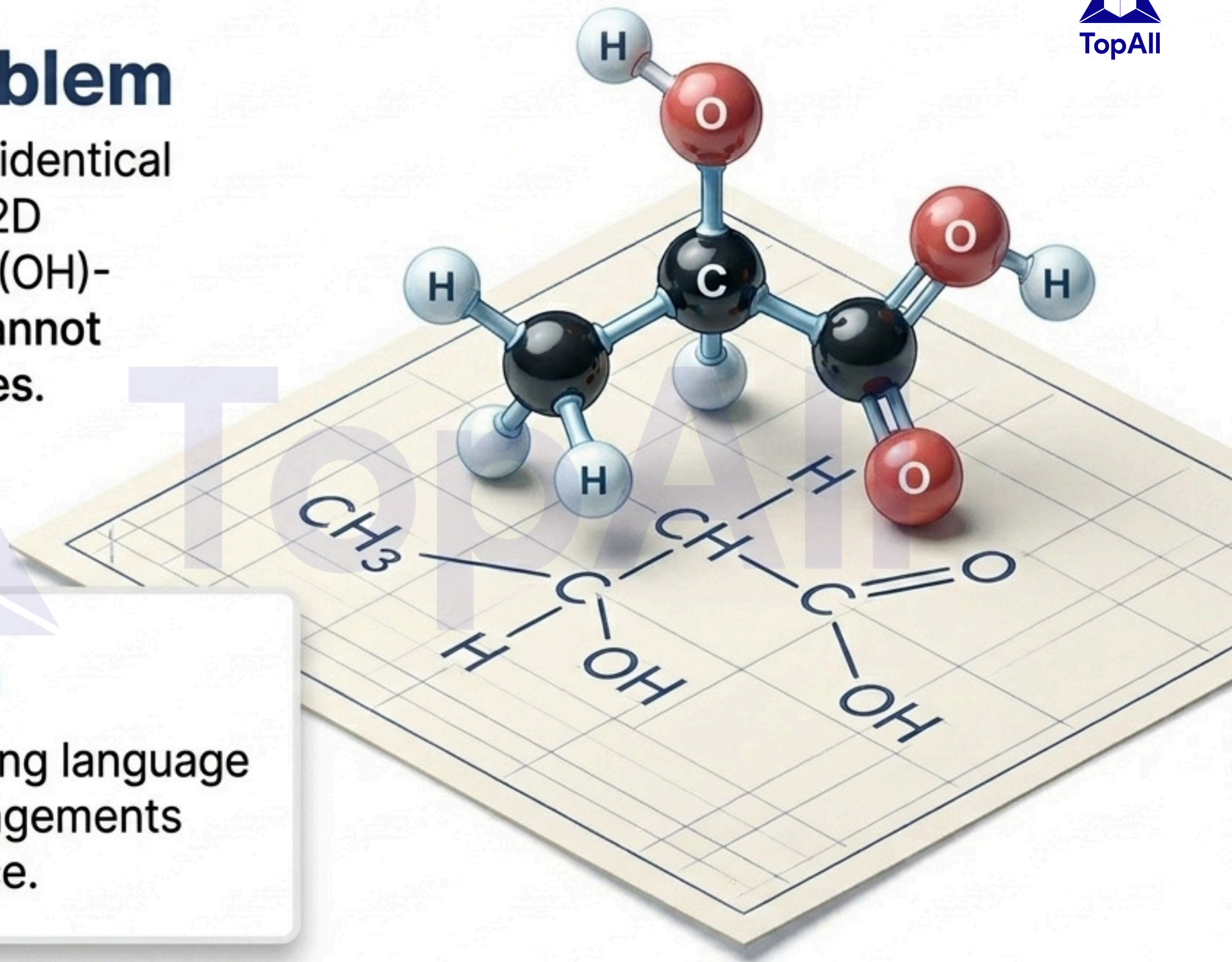


The Flat Paper Problem

Because stereoisomers possess identical connectivity, writing a standard 2D condensed formula (like $\text{CH}_3\text{-CH(OH)-COOH}$) is insufficient. Flat text cannot capture critical spatial differences.

The Solution

We require a specialized drawing language to project true 3D spatial arrangements onto a flat 2D surface.



Wedge and Dash Notation

ESSENTIAL TOOL

Projecting Away:

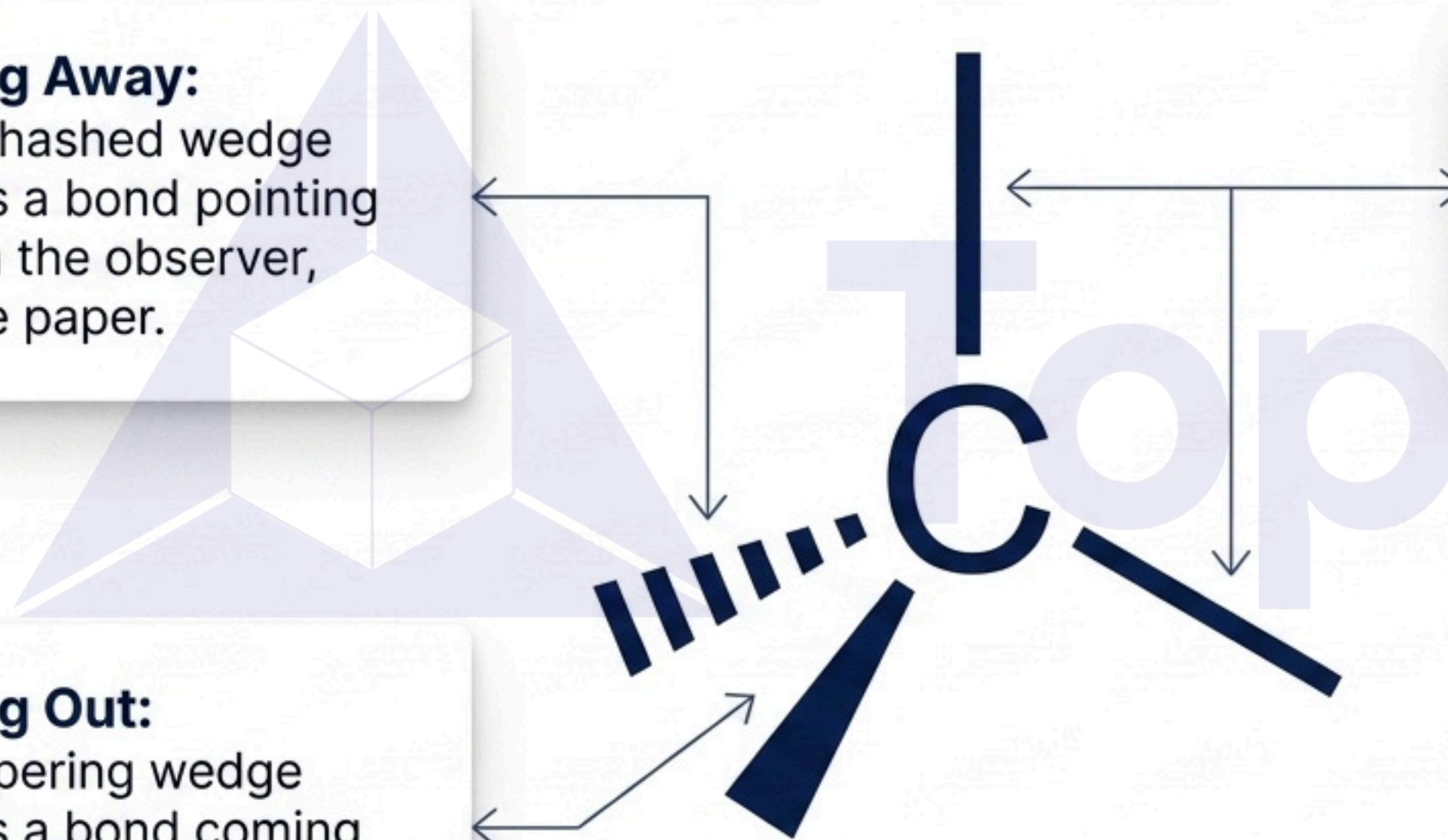
A dashed/hashed wedge represents a bond pointing away from the observer, behind the paper.

In the Plane:

Solid, standard lines represent bonds lying perfectly flat on the paper's surface.

Projecting Out:

A solid, tapering wedge represents a bond coming towards the observer, out of the paper.



Stereoisomerism Essentials

1 Same Connectivity.

Stereoisomers always possess the exact same sequence of bonded atoms.

2 Spatial Reality.

The fundamental difference between stereoisomers is entirely determined by their arrangement in 3D space.

3 3D Notation.

Because 2D formulas fail to show depth, we rely on Wedge-Dash formulas to communicate spatial truth on flat paper.

Mastering 3D representation is the foundational key to unlocking stereochemistry.



You've Learned the Theory.

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