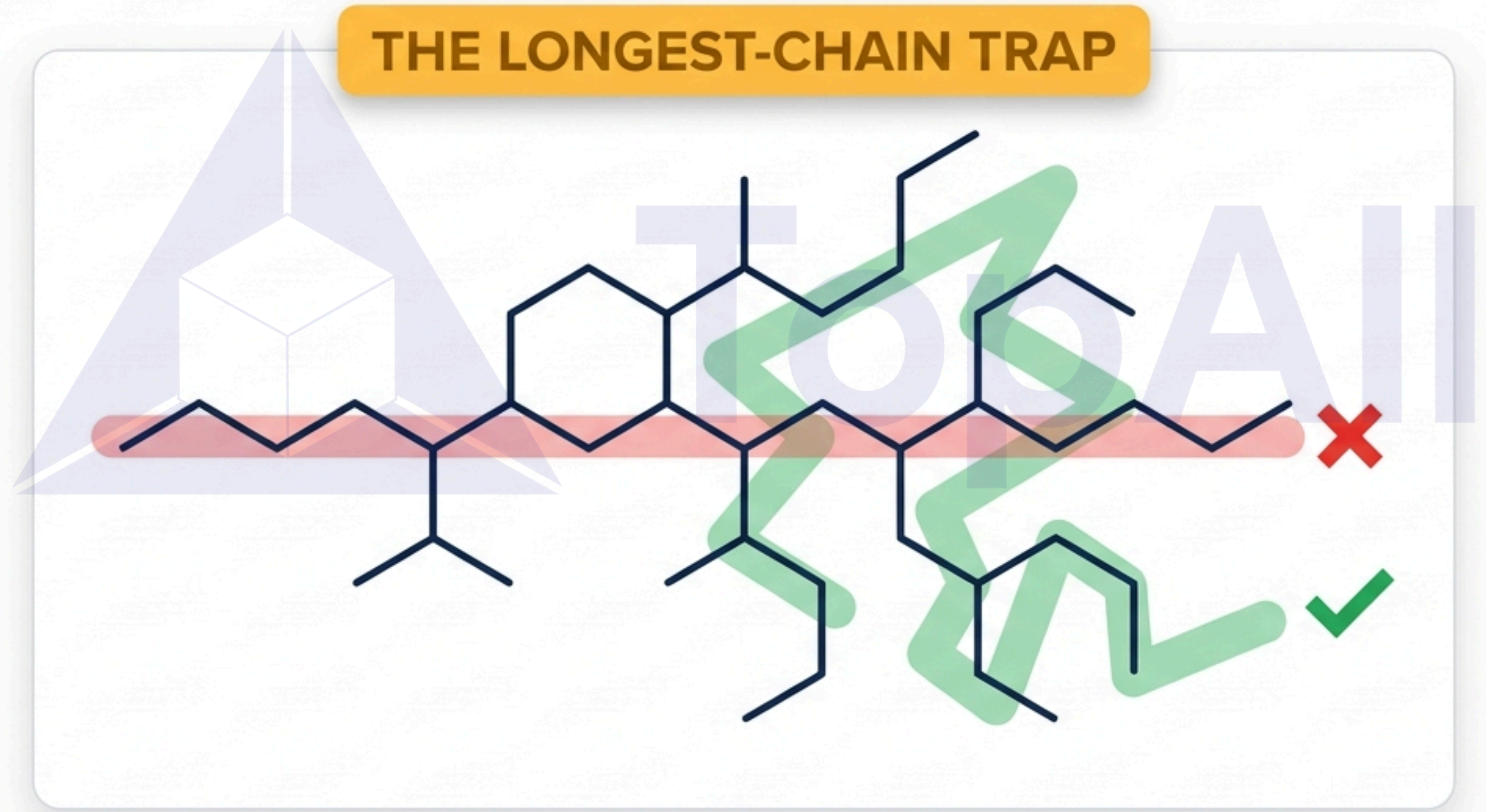


Alkane Nomenclature & Chain Isomerism

The Molecular Blueprint

THE LONGEST-CHAIN TRAP



Understanding Chain Isomerism



Same molecular formula. Different carbon skeleton. Different physical properties.

The Isomer Explosion

$C_4H_{10} \rightarrow 2$ Isomers



$C_5H_{12} \rightarrow 3$ Isomers



$C_6H_{14} \rightarrow 5$ Isomers



For context: $C_{10}H_{22}$ yields 75 isomers!

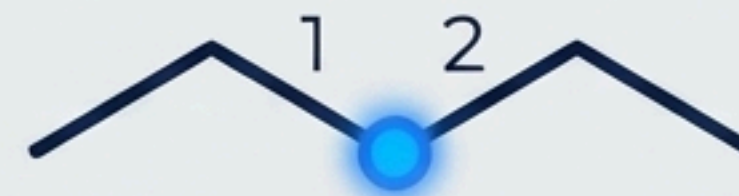
Carbon Classification Blueprint

1° (Primary) Carbon



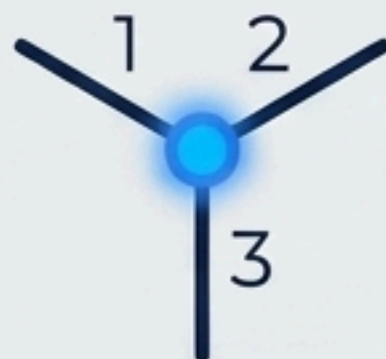
Attached to 1 C

2° (Secondary) Carbon



Attached to 2 C

3° (Tertiary) Carbon



Attached to 3 C

4° (Quaternary / Neo) Carbon



Attached to 4 C



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

$$E=mc^2$$



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Practice Now



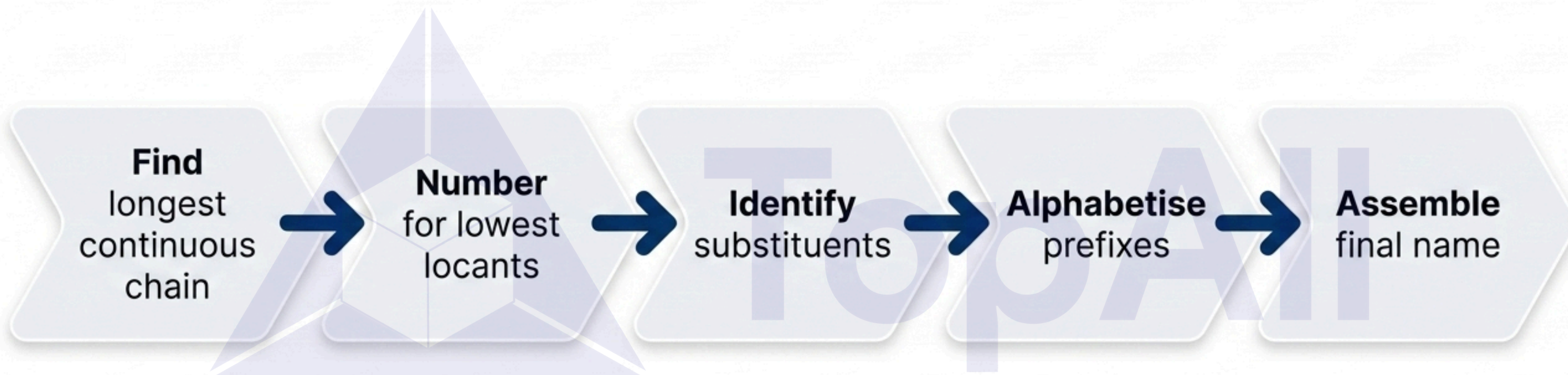
At prep.topall.app

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

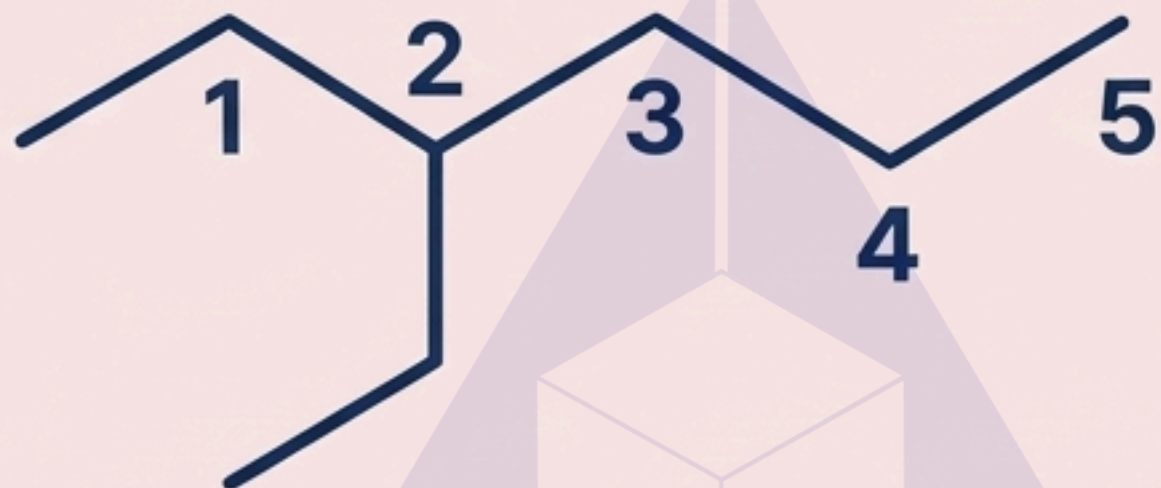


The IUPAC Mechanical Workflow

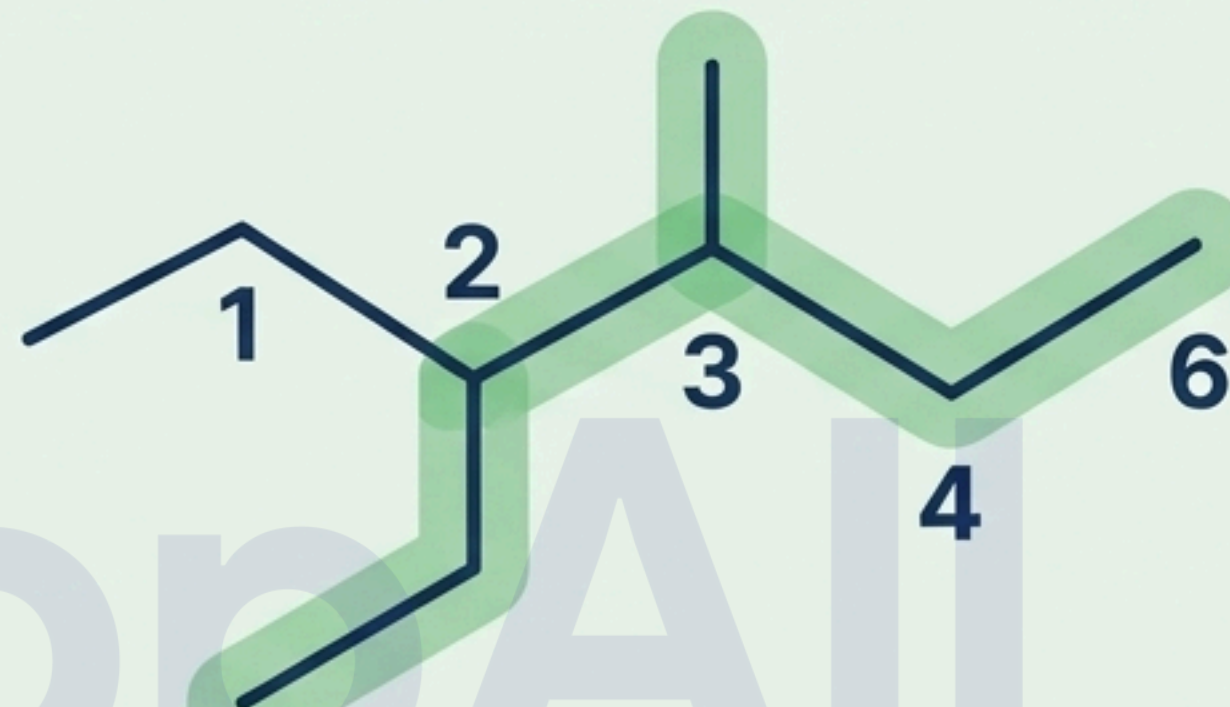


THE TRAP: Longest chain $\neq$ visually straightest chain. Examiners will intentionally bend the longest chain to hide it in the branches.

Applying the Rules: Perspective Shifts



Wrong: 2-Ethylpentane



Correct: 3-Methylhexane ✓

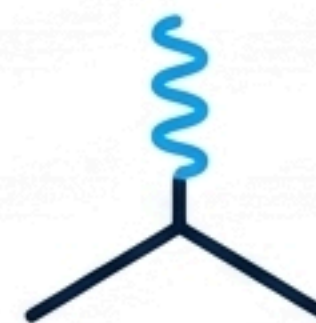
Rule 1 overrules visual bias: The longest continuous carbon chain dictates the parent name, no matter how it is drawn on paper. Number from the end that gives lower locants.

Naming Alkyl Substituents (C_nH_{2n+1})

3-Carbon
Substituents



n-Propyl

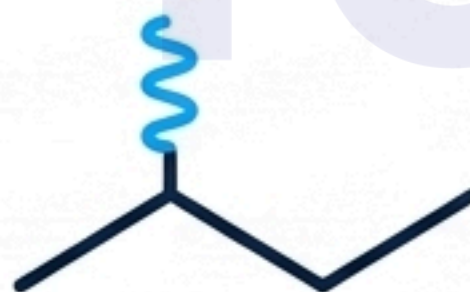


Isopropyl

4-Carbon
Substituents



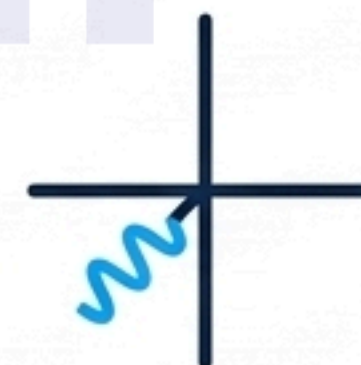
n-Butyl



sec-Butyl



isobutyl



tert-Butyl

The Alphabetical Priority Trap

Arrange substituent names alphabetically before assembling the final name.

IGNORED in Alphabetizing

~~di-~~
~~tri-~~
~~tetra-~~
~~sec-~~
~~tert-~~

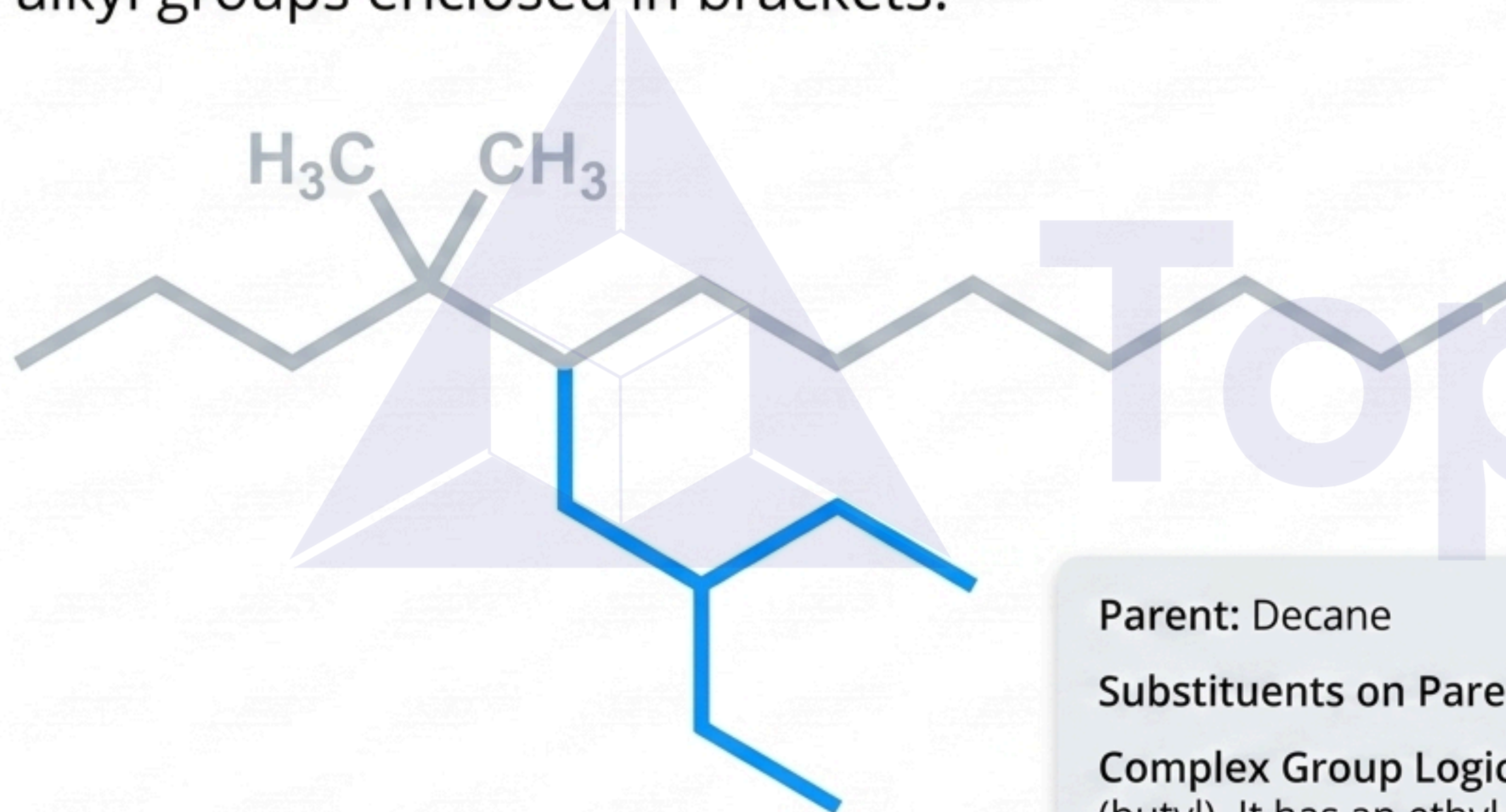
COUNTED in Alphabetizing

iso-
neo-
cyclo-

Application: **Ethyl** beats **dimethyl** (E comes before M, ignoring the 'di').

When Branches Have Branches

Complex substituents are named as substituted alkyl groups enclosed in brackets.



Parent: Decane

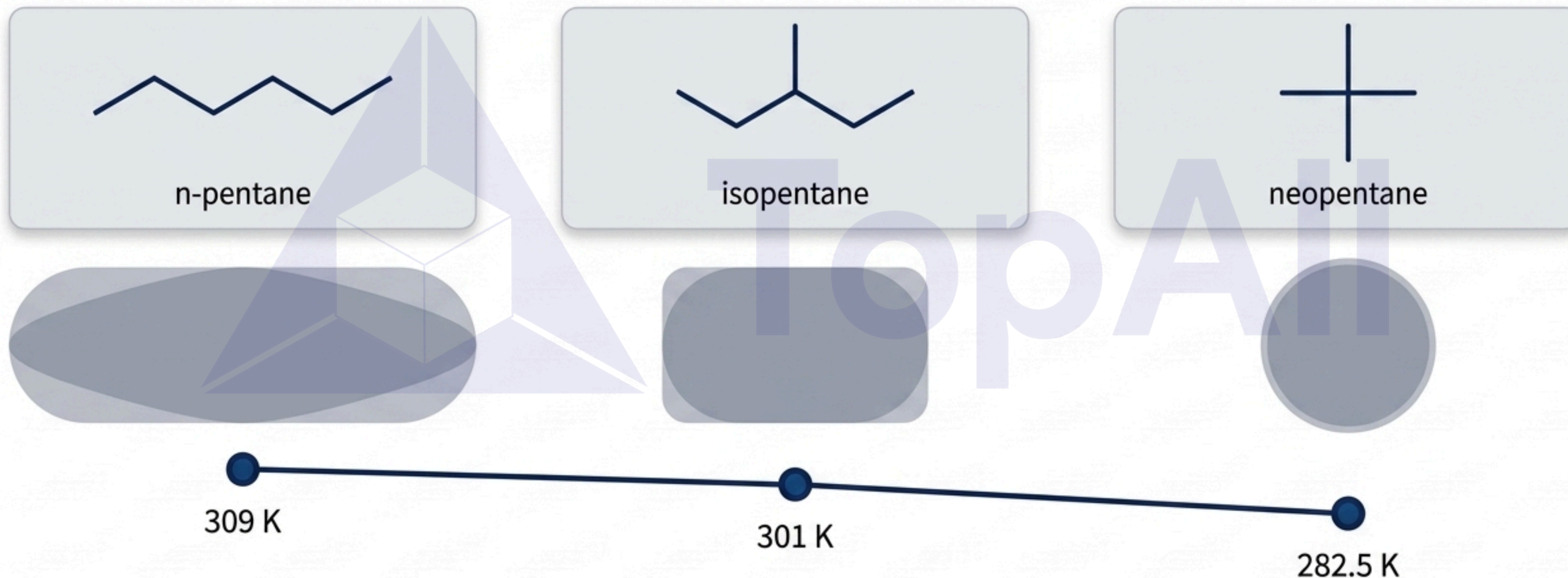
Substituents on Parent: 3,3-dimethyl and a complex group at C5.

Complex Group Logic: Longest branch from C1 is 4 carbons (butyl). It has an ethyl on its C2. → (2-Ethylbutyl).

Final Name: 5-(2-Ethylbutyl)-3,3-dimethyldecane

Isomerism & Physical Properties Synthesis

As branching increases, boiling point decreases.



Key Takeaways: Spherical molecules have less surface area of contact → Weaker Van der Waals forces → Lower boiling points.



You've Learned the Theory.

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