

SECTION 8.5.1

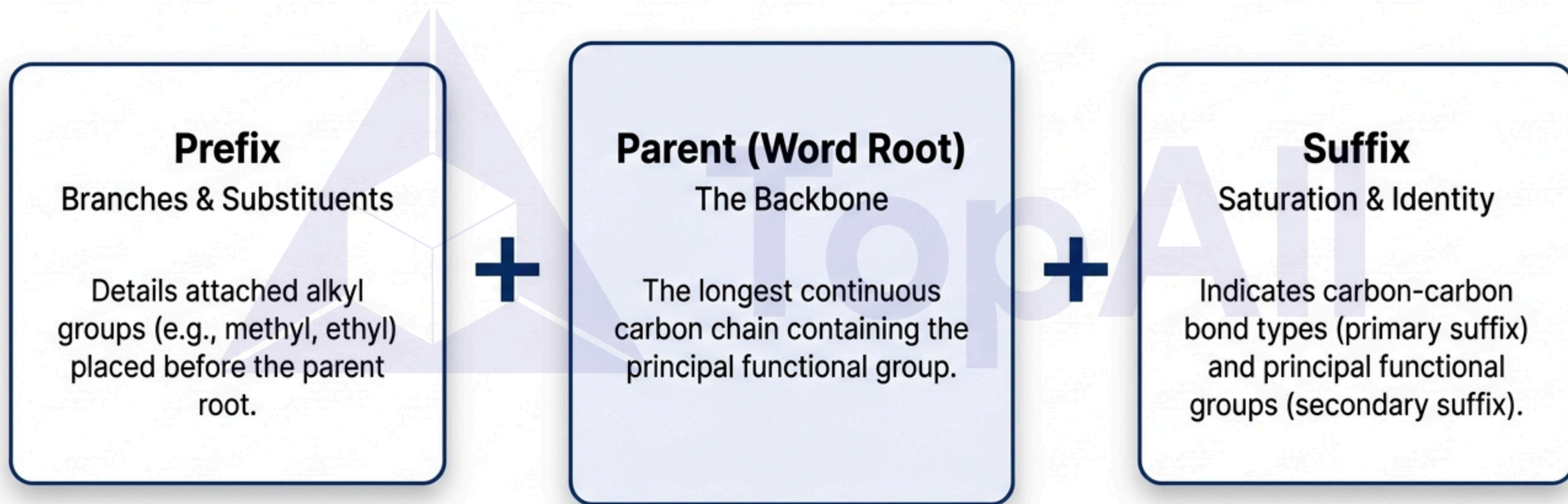
The IUPAC System of Nomenclature

Decoding the Grammar of Organic Compounds

A systematic guide to identifying parent hydrocarbons, functional groups, prefixes, and suffixes.

The Logic of Nomenclature

Every systematic IUPAC name is built by modifying a fundamental parent hydrocarbon. It functions exactly like a modular grammar equation.



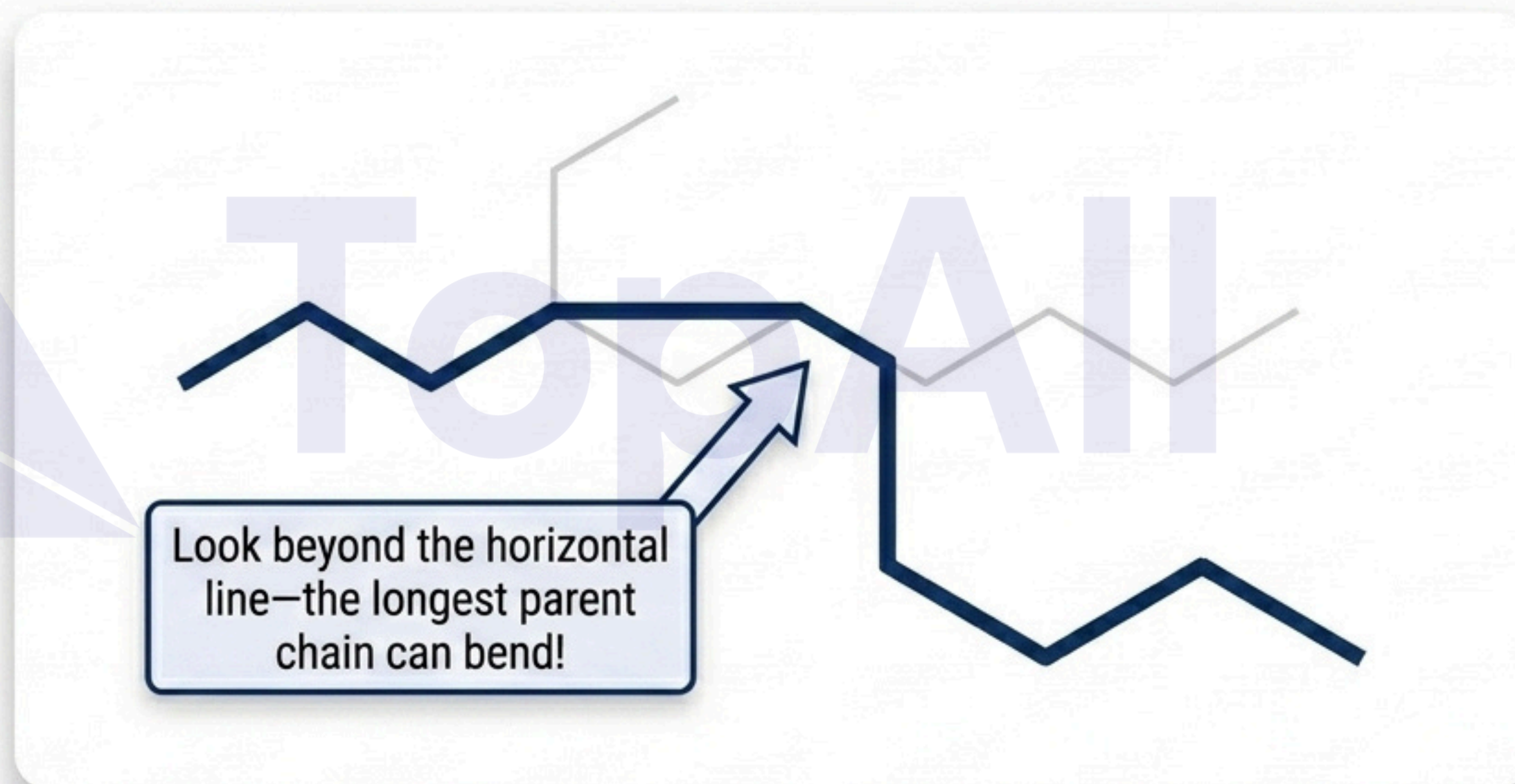
EXAM FOCUS

IUPAC names eliminate ambiguity—every unique structure maps to exactly one systematic name.

Step 1: The Parent Hydrocarbon

The foundation of the name is the longest continuous carbon chain. This dictates the central "Word Root" of the entire compound.

C1	→	Meth-
C2	→	Eth-
C3	→	Prop-
C4	→	But-
C5	→	Pent-
C6	→	Hex-



EXAM FOCUS

IUPAC names eliminate ambiguity—every unique structure maps to exactly one systematic name.



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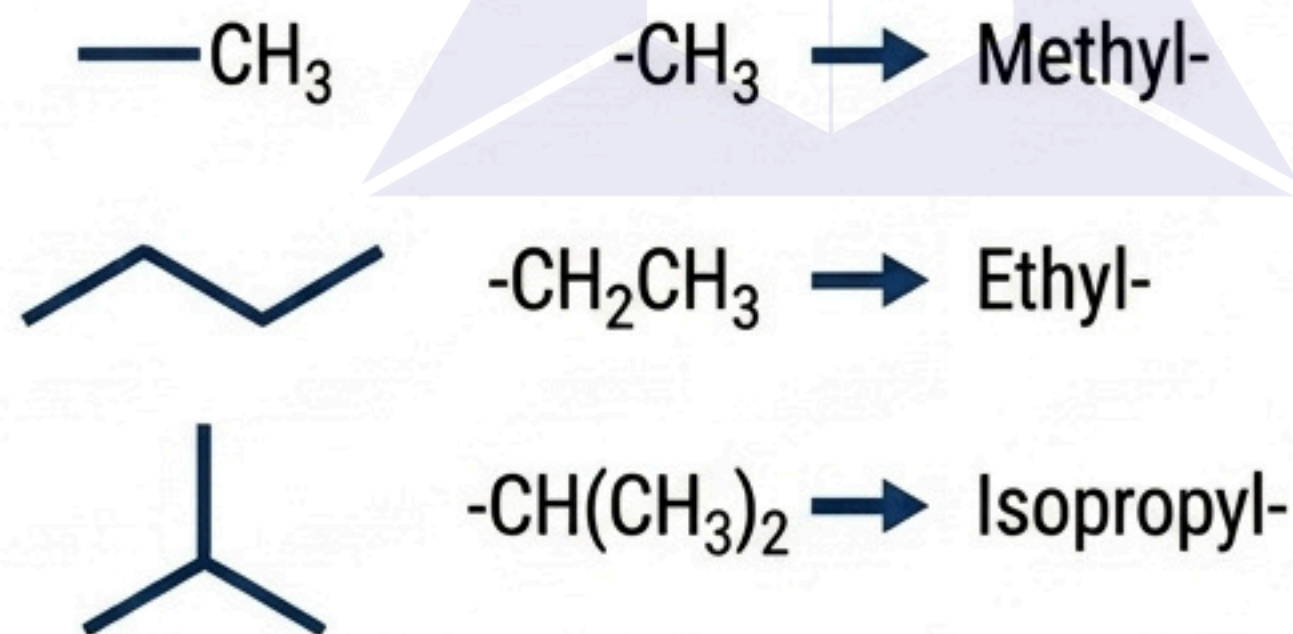


Step 2: Adding Prefixes and Suffixes

Once the parent chain is identified, attached atoms or groups modify the name at the beginning (prefixes) and the end (suffixes).

Alkyl Groups & Substituents

Placed before the parent name. Formed by **removing** a hydrogen from an alkane (suffix changes from '-ane' to '-yl').



Rule: When multiple prefixes exist, list them in alphabetical order.

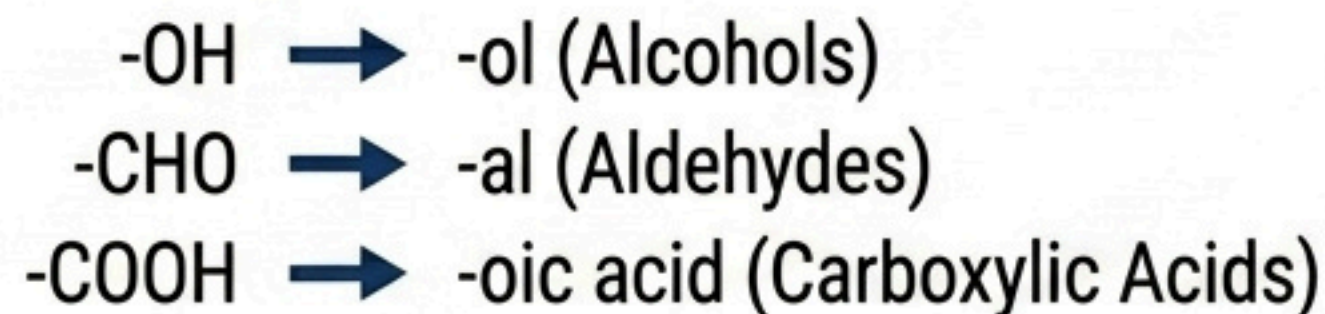
Saturation & Functional Groups

Placed after the parent name. Dictates the primary chemical behavior.

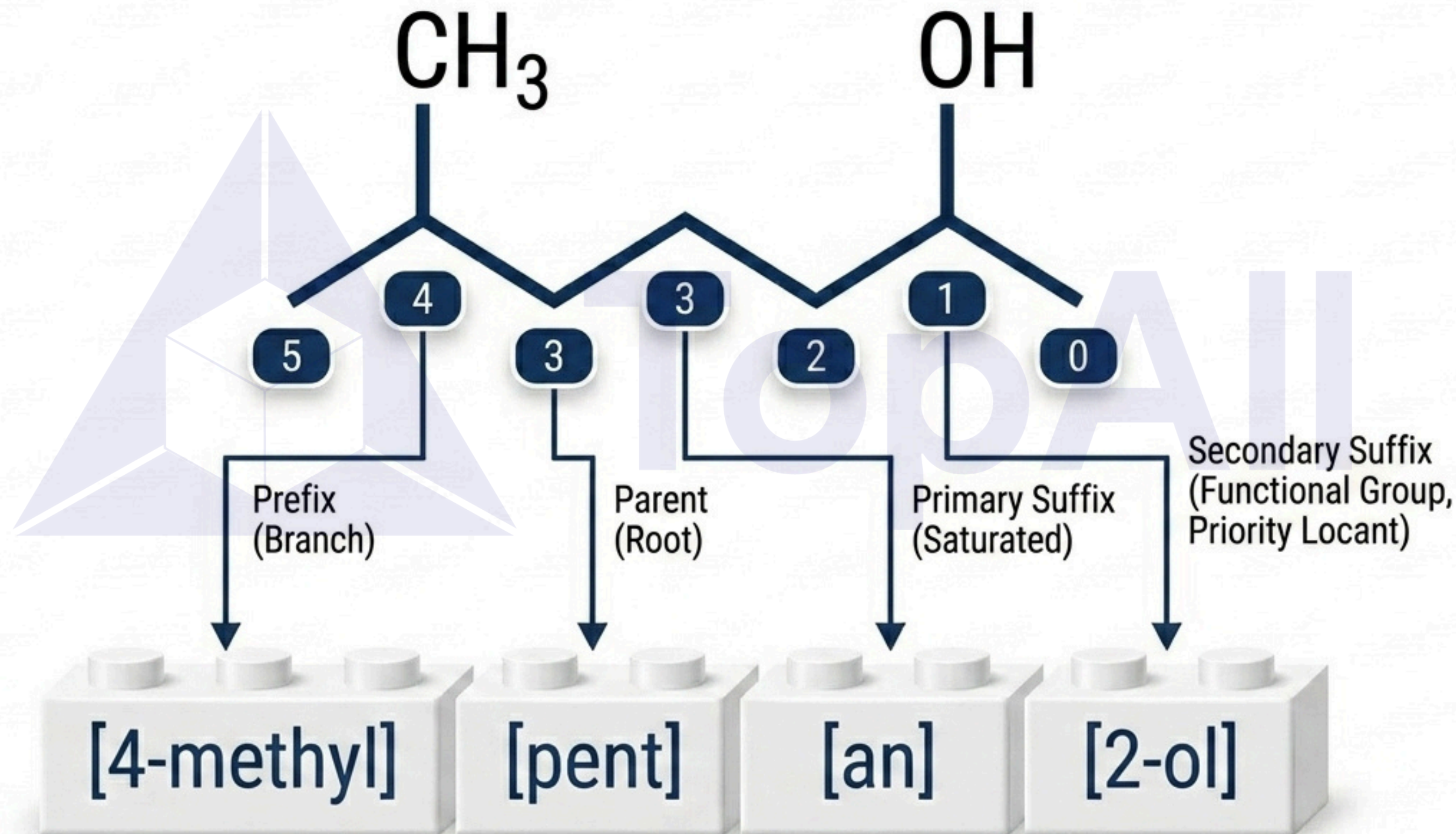
Primary Suffixes

Single bonds (-ane), Double bonds (-ene).

Secondary Suffixes



Decoding a Complete Structure



Key Takeaways: IUPAC Logic

Find the Longest Chain First. The parent hydrocarbon dictates the word root. Always trace the longest possible continuous path, prioritizing double/triple bonds or functional groups if present.

Number for the Lowest Locants. Number the parent chain so that principal functional groups, then double/triple bonds, and finally branched alkyls receive the lowest possible numbers.

Assemble Modularly. Write the name exactly like a formula: Locant-Prefix + Root + Suffix. Alphabetize multiple prefixes (e.g., ethyl before methyl), ignoring numerical multipliers like di- or tri-.



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