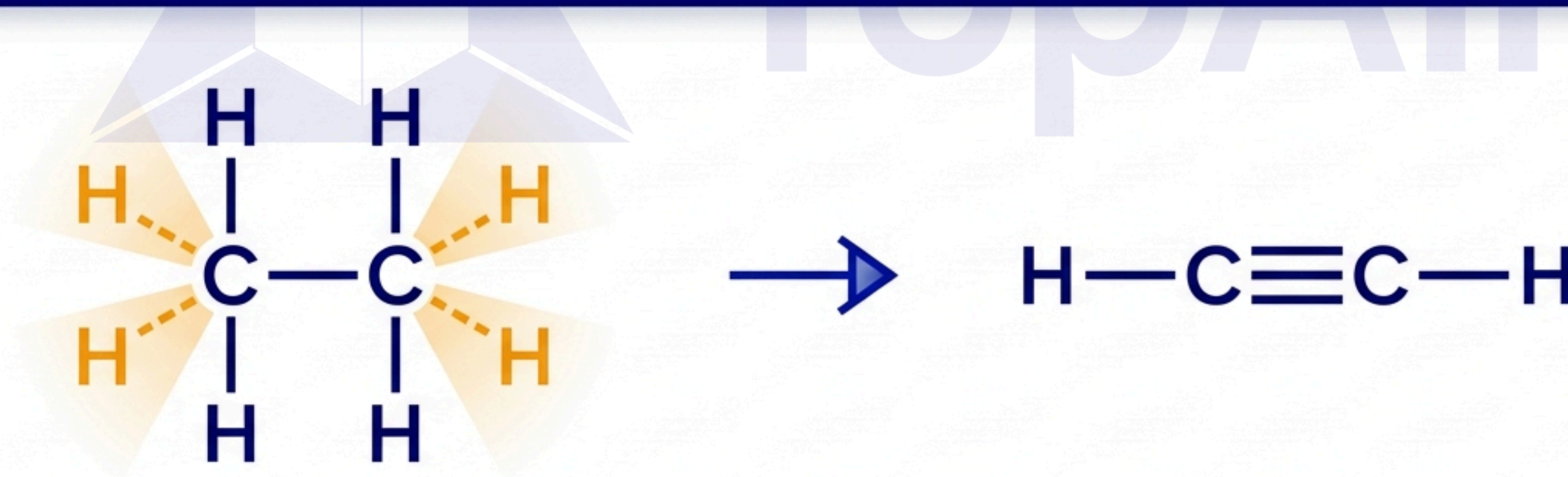




FOUR HYDROGENS FEWER THAN THE CORRESPONDING ALKANE.



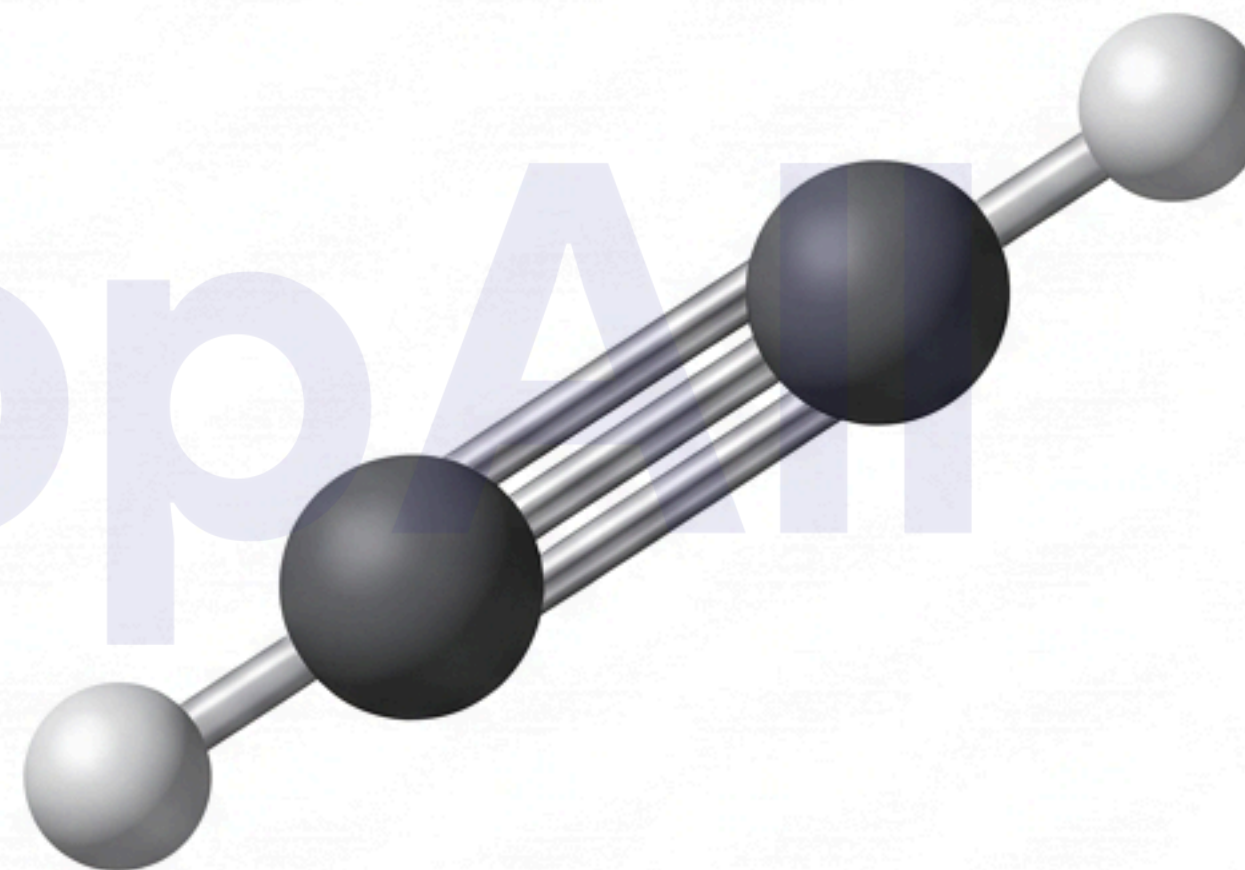
What is an Alkyne?

- **Unsaturated** aliphatic hydrocarbons.
- Must contain at least **one triple bond**.



First stable member: Ethyne

(Commonly known as Acetylene)



C_2H_2



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

$$E=mc^2$$



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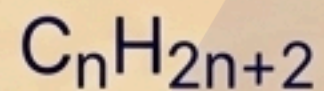
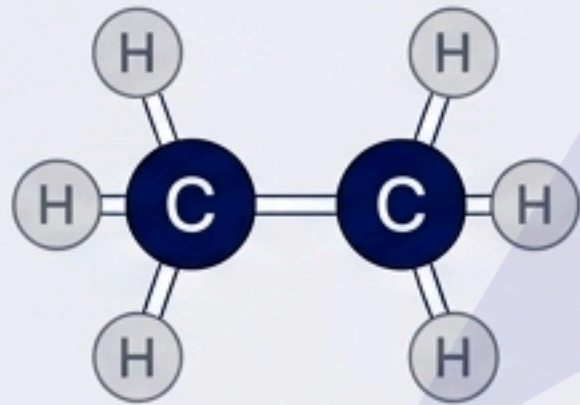
Key Highlights

- » 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



Hydrocarbon Diagnostic Matrix

Alkane



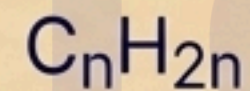
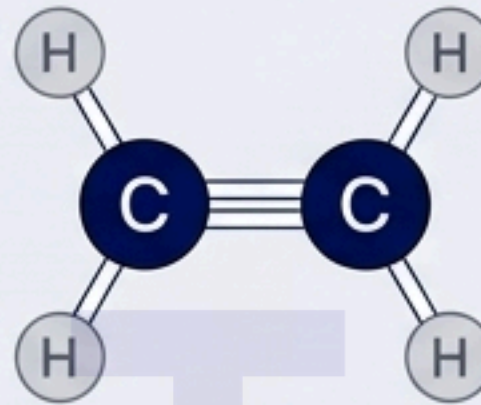
sp^3

Tetrahedral

154 pm

348 kJ/mol

Alkene



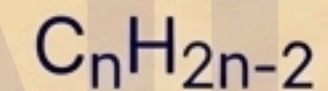
sp^2

Planar

133 pm

681 kJ/mol

Alkyne

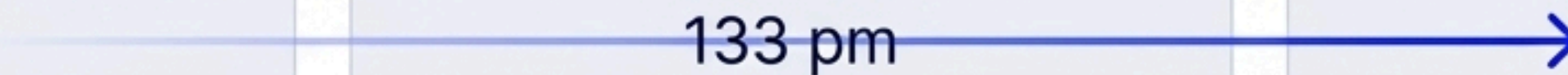


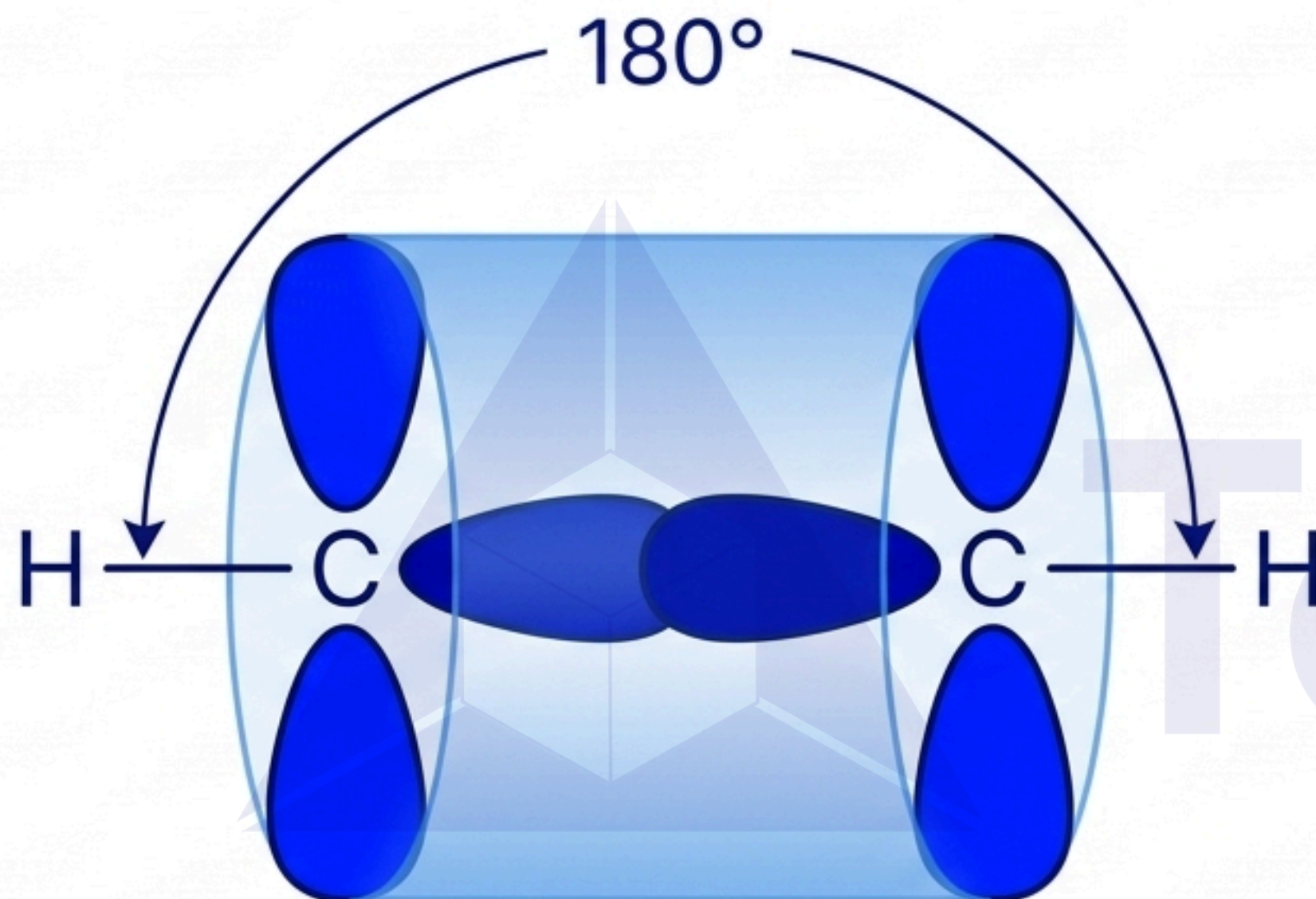
sp

Linear (180°)

120 pm

823 kJ/mol





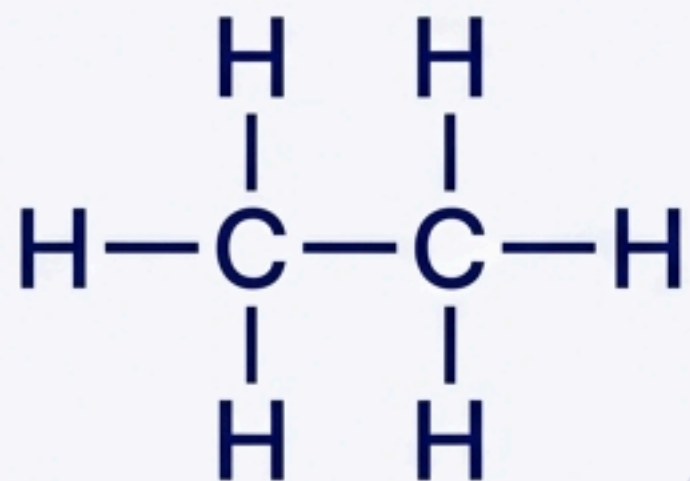
The Linear Architecture

Two *sp* hybridized carbons form a linear axis. The sideways overlap of two *p-orbitals* creates a cylindrically symmetrical *pi-electron cloud*.

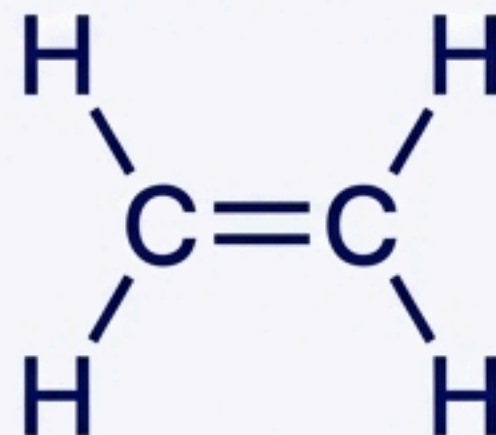
Real-World Anchor



When mixed with oxygen gas, ethyne produces the oxyacetylene flame, burning hot enough for industrial arc welding.



0 Degrees



1 Degree



2 Degrees

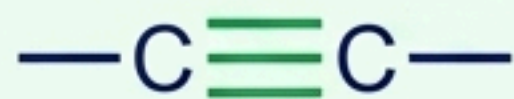
A $\text{C}\equiv\text{C}$ triple bond contributes two degrees of unsaturation to a molecule.



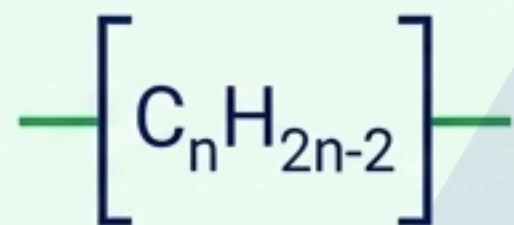
Don't confuse the number of pi-bonds with the number of triple bonds when calculating structures! A single triple bond contains 2 pi-bonds, meaning:

1 Triple Bond = 2 Degrees of Unsaturation (DoU)

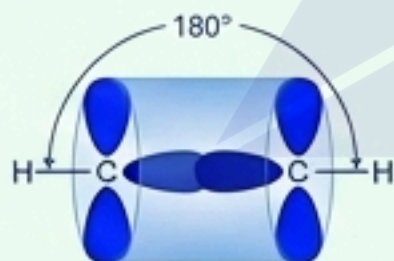
Final Blueprint: The Alkyne Profile



- **Classification:** Alkynes are unsaturated hydrocarbons defined by at least one carbon-carbon triple bond.



- **Mathematical Anchor:** General formula is $\text{C}_n\text{H}_{2n-2}$ (4 hydrogens fewer than alkanes).



- **Architecture:** Ethyne (C_2H_2) is linear (180°), driven by sp hybridized carbons and a cylindrically symmetrical pi-cloud.



- **JEE Metric:** Each triple bond consists of 1 sigma and 2 pi bonds, contributing exactly 2 Degrees of Unsaturation.



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