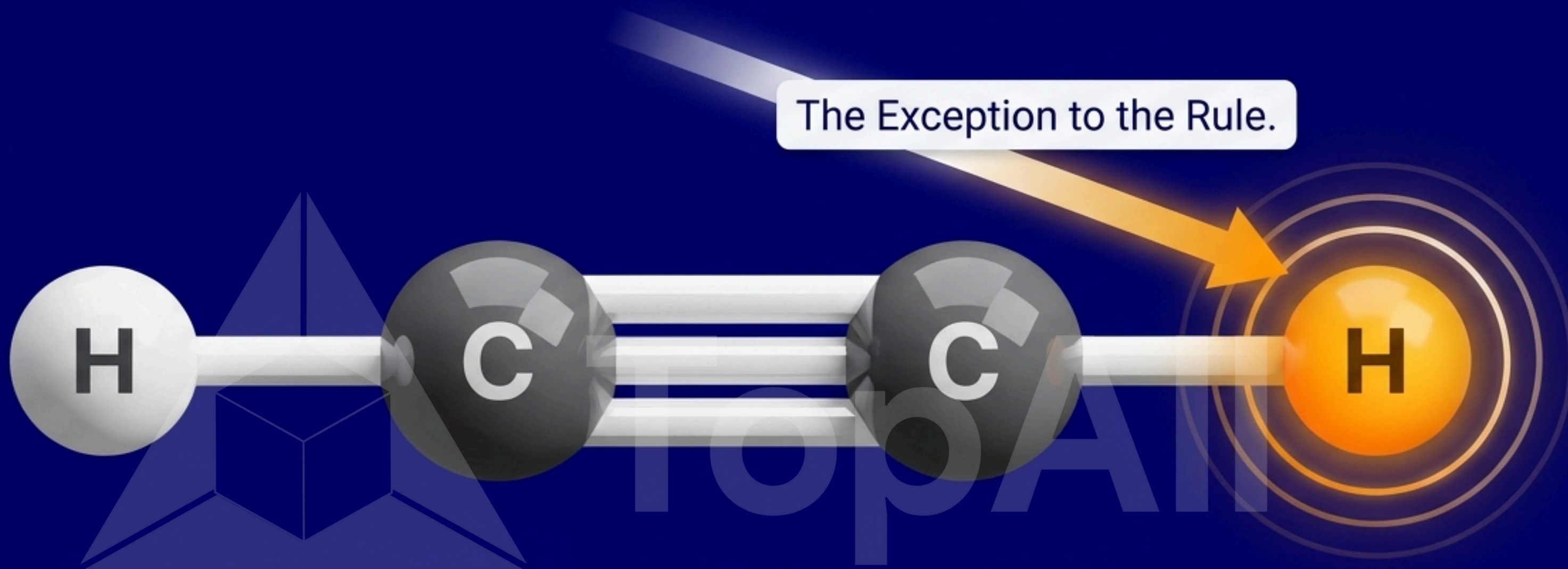


WHY IS A TERMINAL ALKYNE HYDROGEN SPECIAL?



Alkanes and alkenes are famously non-acidic. But attach a hydrogen to a triply bonded carbon, and the rules of hydrocarbon chemistry shift entirely. Why does this specific proton detach so easily?

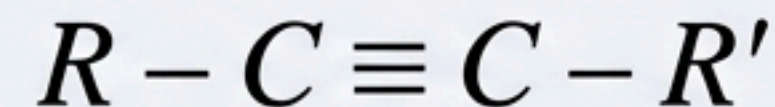
THE ARCHITECTURAL DIVIDE: TERMINAL VS. INTERNAL

Terminal Alkynes



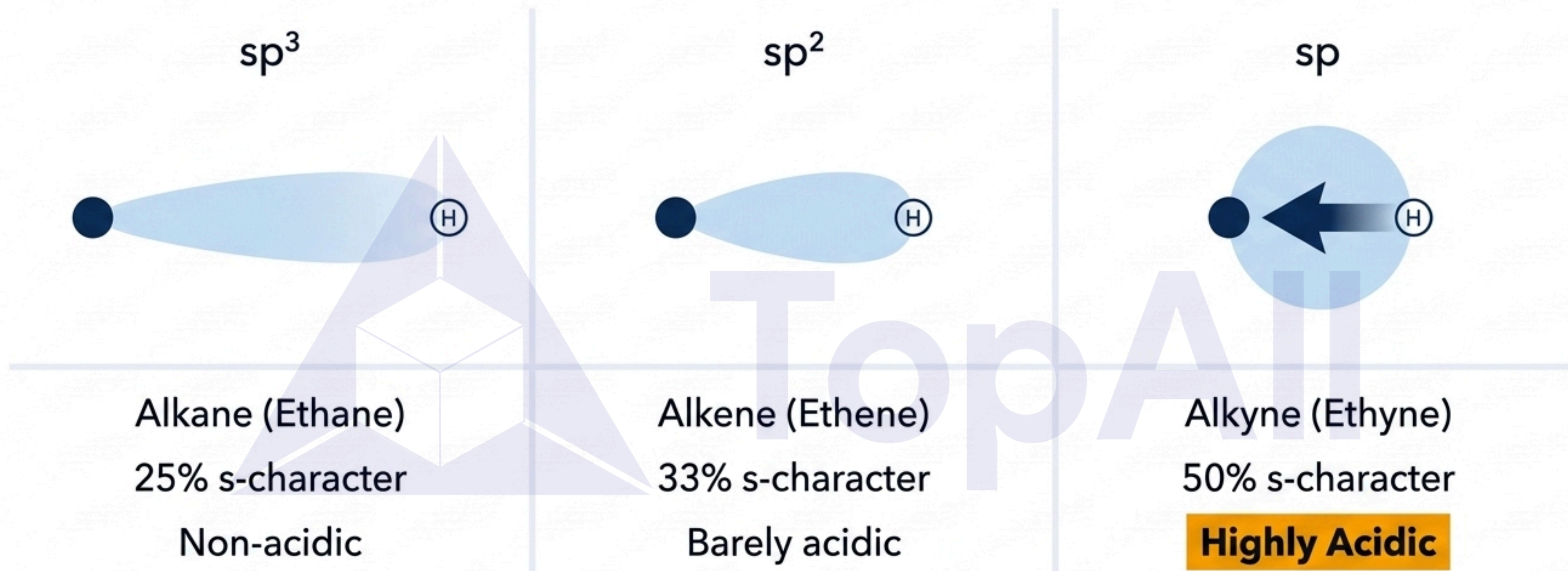
- ✓ The triple bond is at the extreme end of the carbon chain.
- ✓ Key Trait: Contains the highly acidic, replaceable hydrogen atom.

Internal Alkynes



- ✓ The triple bond is buried within the interior of the carbon chain.
- ✓ Key Trait: Lacks acidic hydrogens; chemically shielded.

ORBITAL PULL: THE POWER OF S-CHARACTER



Higher s-character means the sp hybridized orbitals are physically closer to the positively charged carbon nucleus. This massive spike in electronegativity pulls the shared C-H electrons inward, weakening the bond and allowing the H^+ to escape.



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$$E=mc^2$$



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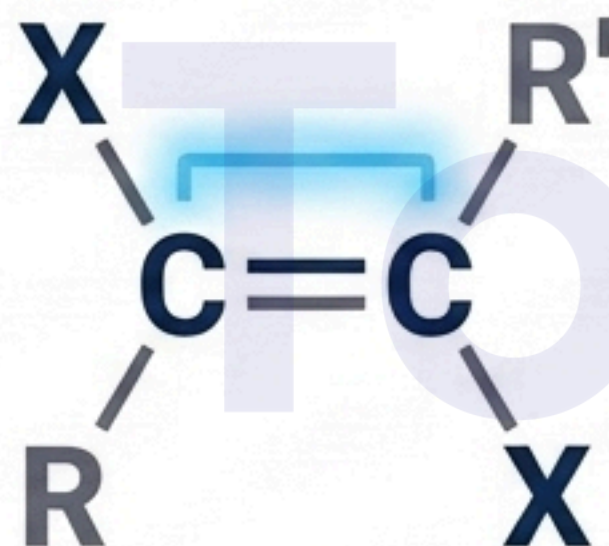


STEPWISE SATURATION: CONSUMING THE π -BONDS

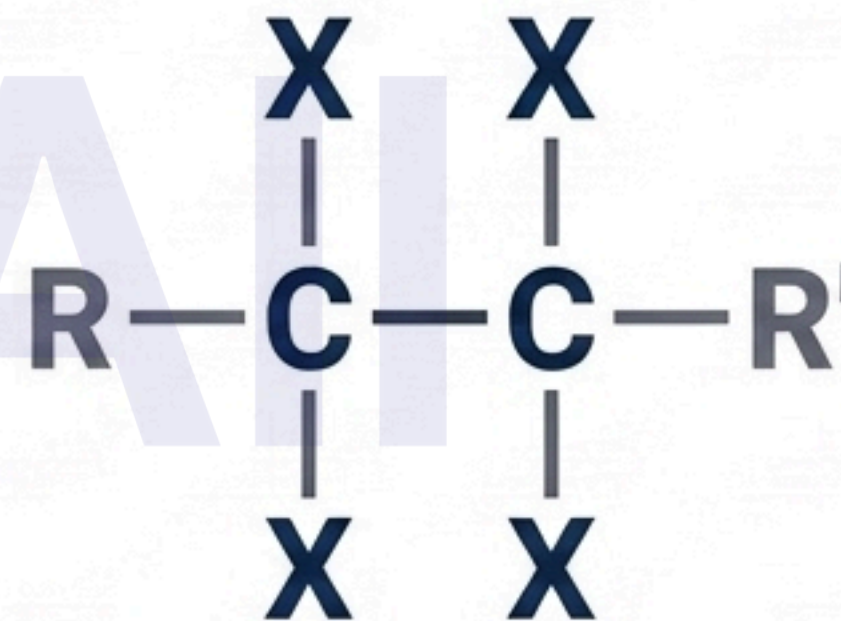
Alkyne
(Unsaturated Powerhouse)



Alkene
(Intermediate)

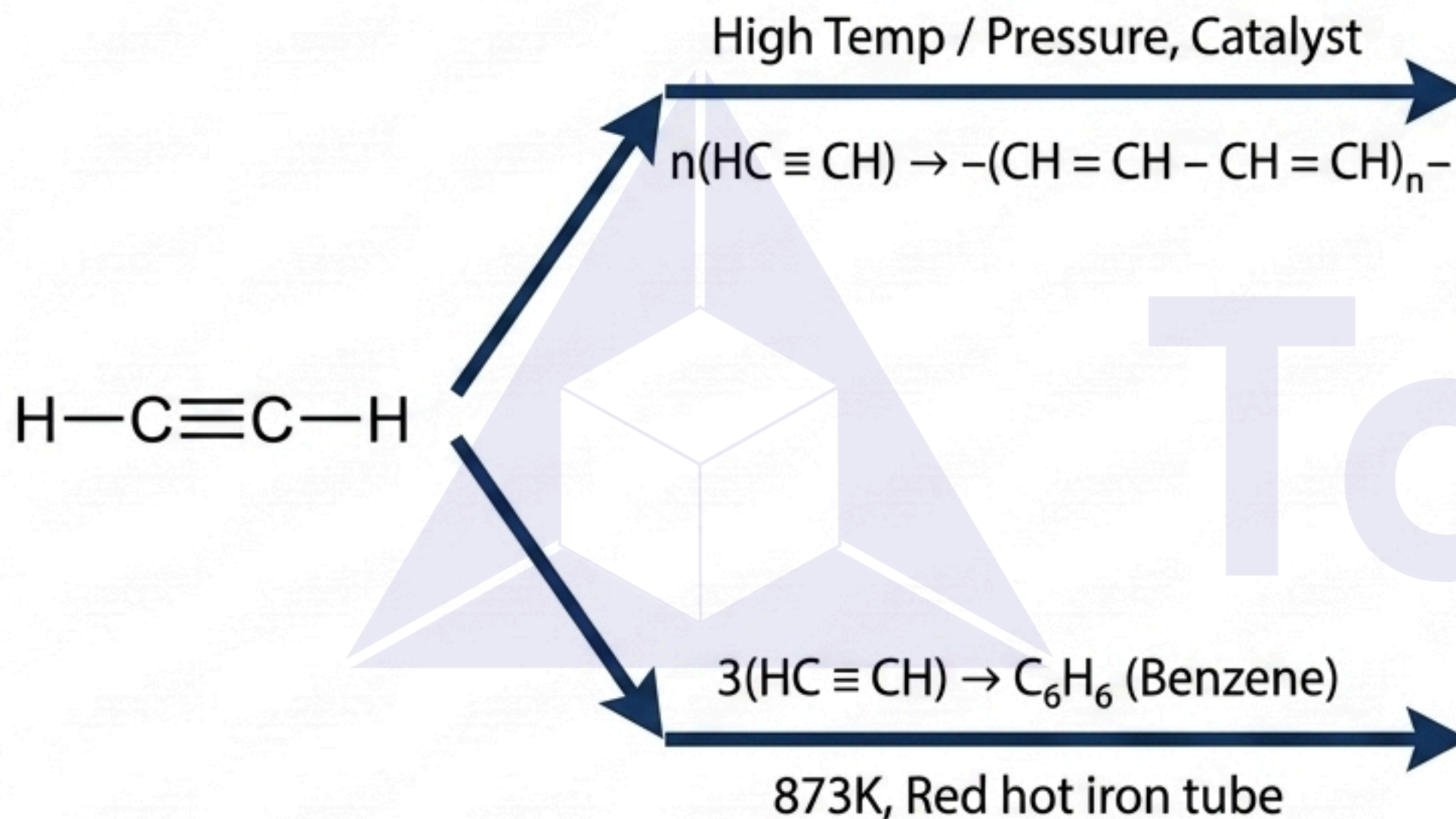


Alkane
(Fully Saturated)

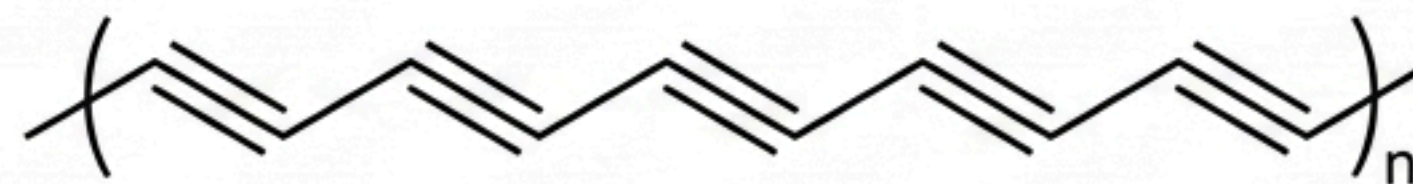


Bromine Water Test: Addition of Br_2 in CCl_4 discharges the reddish-orange colour. A visual proof of unsaturation.

MOLECULAR ASSEMBLY: LINEAR CHAINS & AROMATIC RINGS

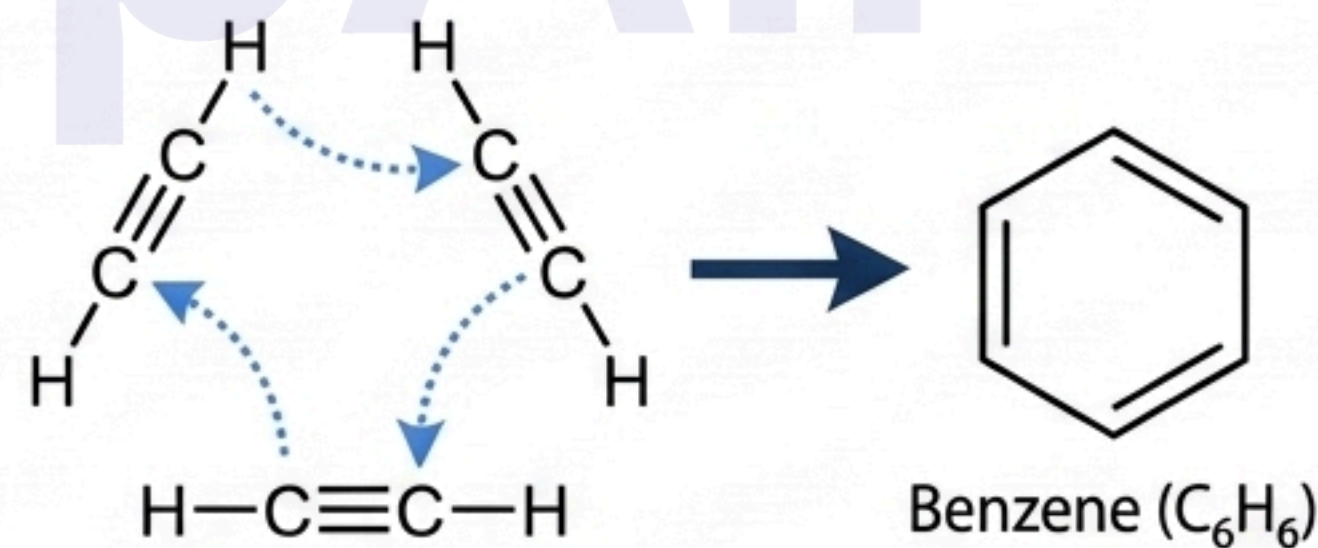


Linear Polymerisation



Insight: These thin polymer films conduct electricity and are used in modern battery electrodes.

Cyclic Polymerisation - JEE Favorite



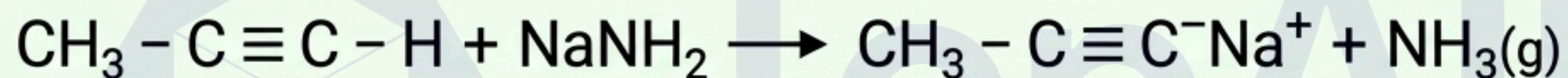
Insight: The ultimate bridge from aliphatic chains to aromatic rings.

JEE TRAP ALERT: THE BASE TEST

TRAP WARNING: Examiners will tempt you to react internal alkynes with strong bases (Na or NaNH₂). Without a terminal sp-hybridized hydrogen, the reaction is impossible.



Terminal Alkyne + Sodamide



Internal Alkyne + Sodamide



Key Takeaways:

- sp hybridization (50% s-character) drives terminal alkyne acidity.
- Alkynes undergo stepwise electrophilic addition.
- Cyclic polymerization of ethyne yields benzene at 873K.



You've Learned the Theory.

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