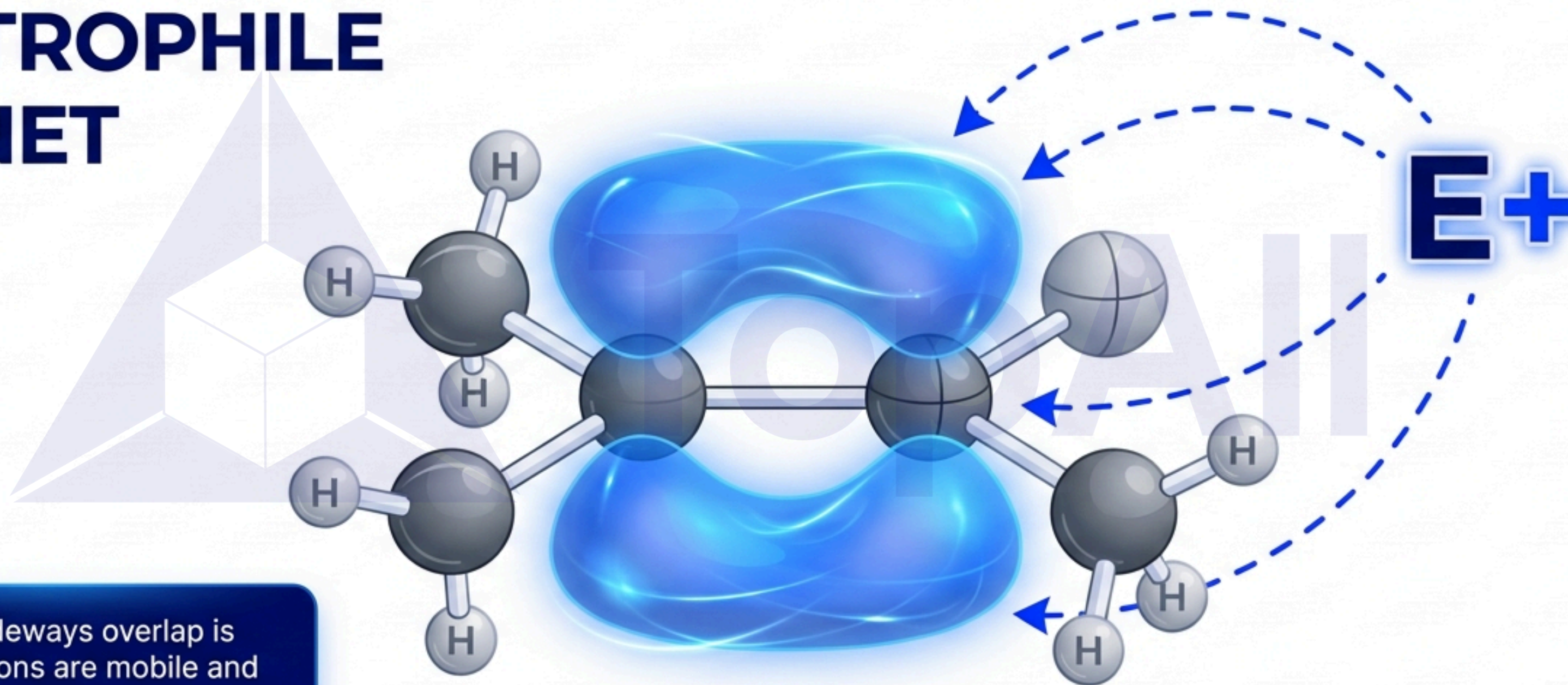


THE π BOND IS AN ELECTROPHILE MAGNET

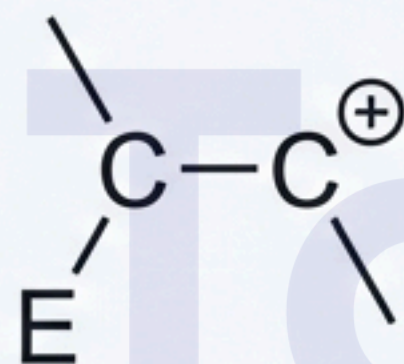


Because 2p sideways overlap is weak, pi electrons are mobile and loosely held—perfect targets for electron-deficient species (electrophiles).

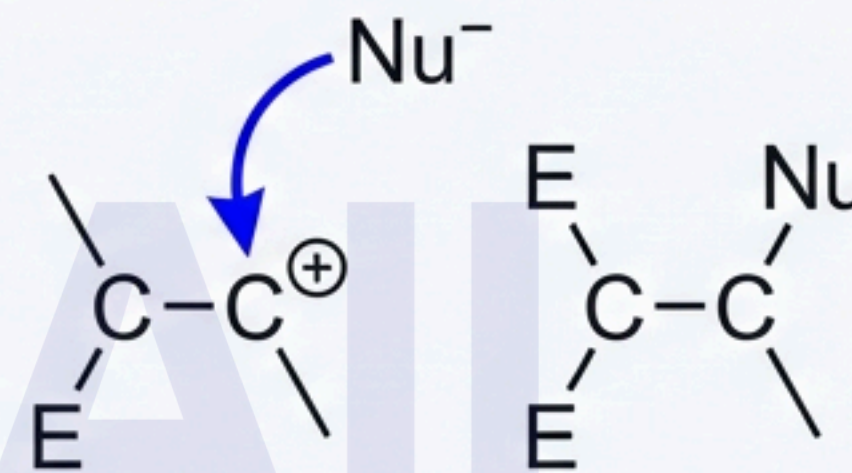
The Core Reaction Pattern: Two-Step Electrophilic Addition



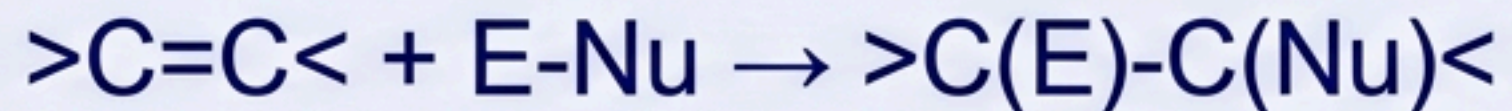
Step 1: π bond attacks electrophile.



Step 2: Carbocation is formed.
(Slow, rate-determining step).



Step 3: Nucleophile attacks.
(Fast step).





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

$$E=mc^2$$



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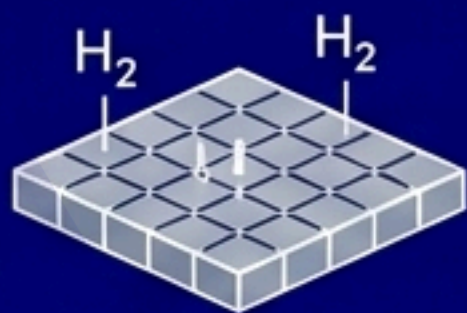
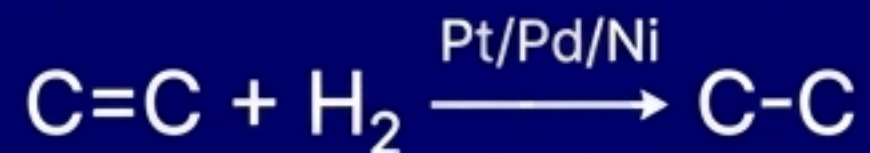
Key Highlights

- » 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

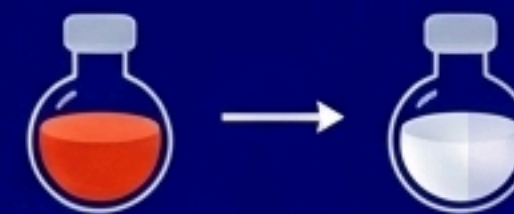


The Major Addition Dashboard

Hydrogenation



Halogenation (Unsaturation Test)



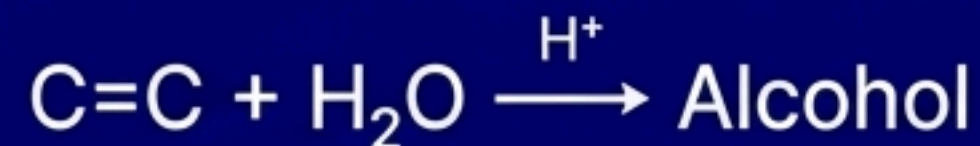
Discharge of reddish-orange color acts as a test for unsaturation.

Hydrohalogenation



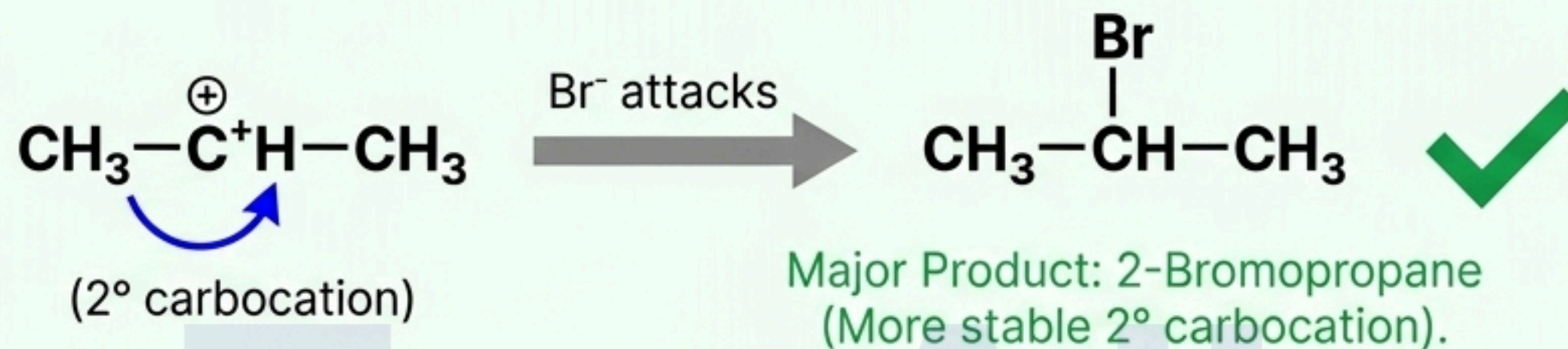
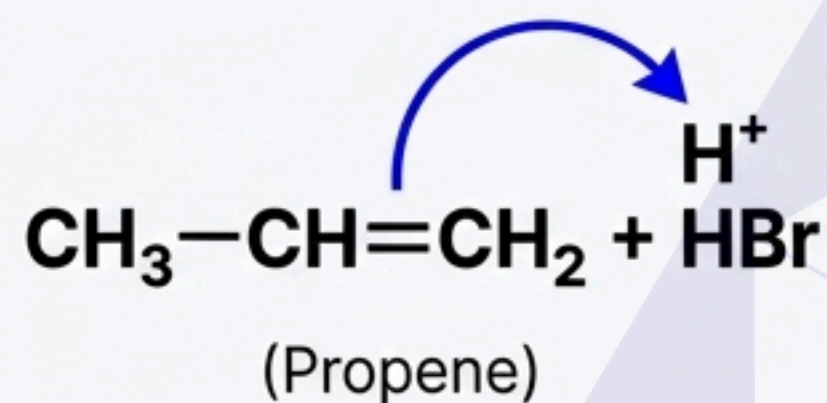
Reactivity order: $\text{HI} > \text{HBr} > \text{HCl}$

Hydration



Requires cold concentrated H_2SO_4 catalyst.

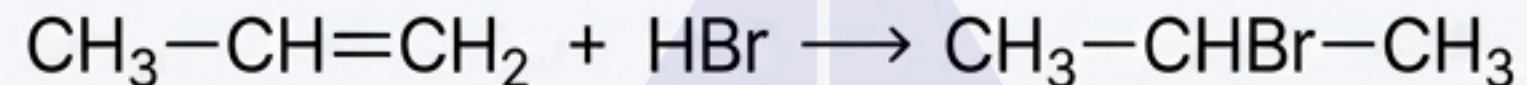
Asymmetry & Regioselectivity: Markovnikov's Rule



The negative part of the addendum (Br⁻) gets attached to the carbon atom which possesses a lesser number of hydrogen atoms.

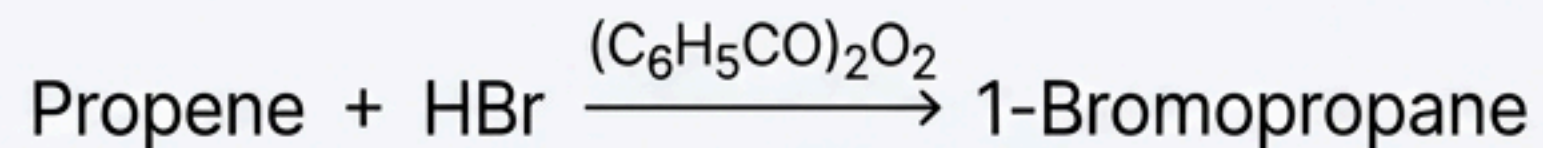
The Exception: Peroxide (Kharash) Effect

Normal Conditions



- Mechanism: Ionic (Carbocation intermediate)
- Rule: Markovnikov

Peroxide Added



- Mechanism: Free Radical intermediate (2° radical is more stable)
- Rule: Anti-Markovnikov

SPECIAL EXCEPTION

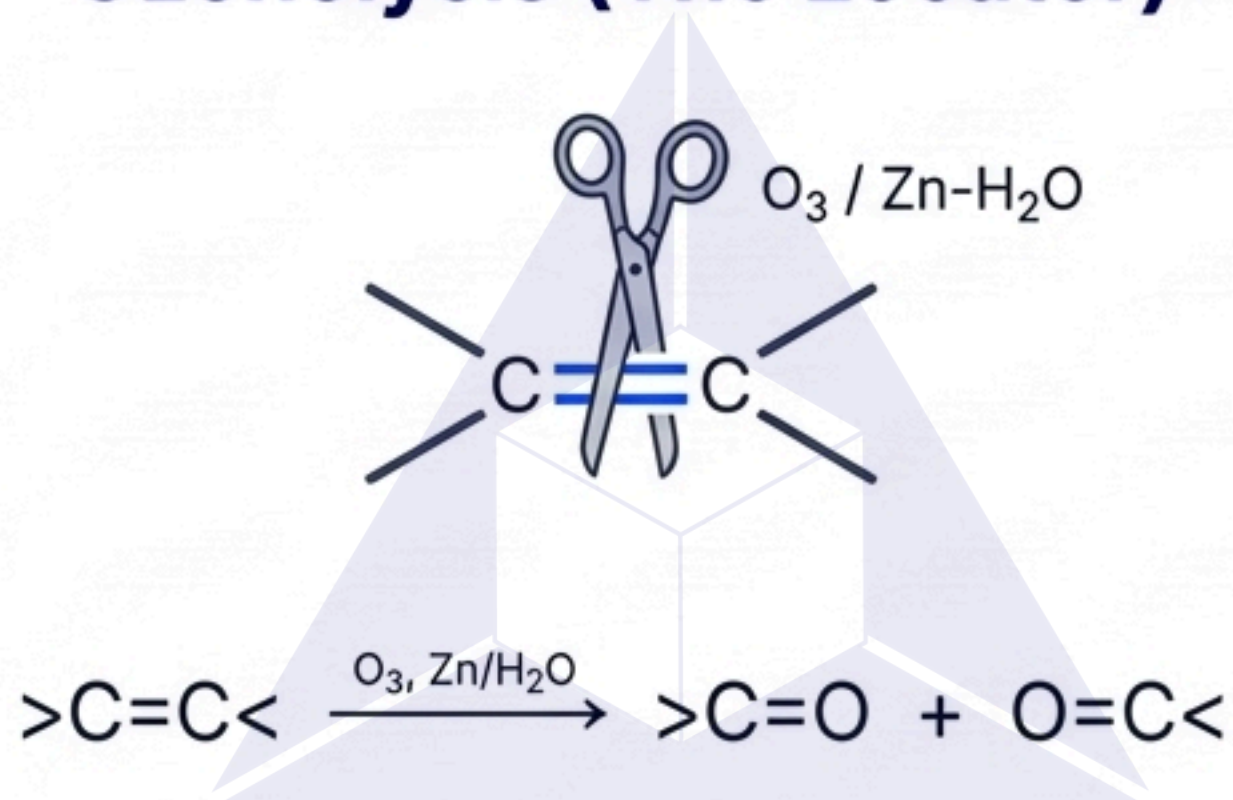


The Peroxide effect ONLY works with HBr!

- HCl bonds are too strong (430.5 kJ/mol) to cleave homolytically.
- HI bonds are weak (296.8 kJ/mol), but iodine radicals combine to form I₂ rather than attacking the double bond.

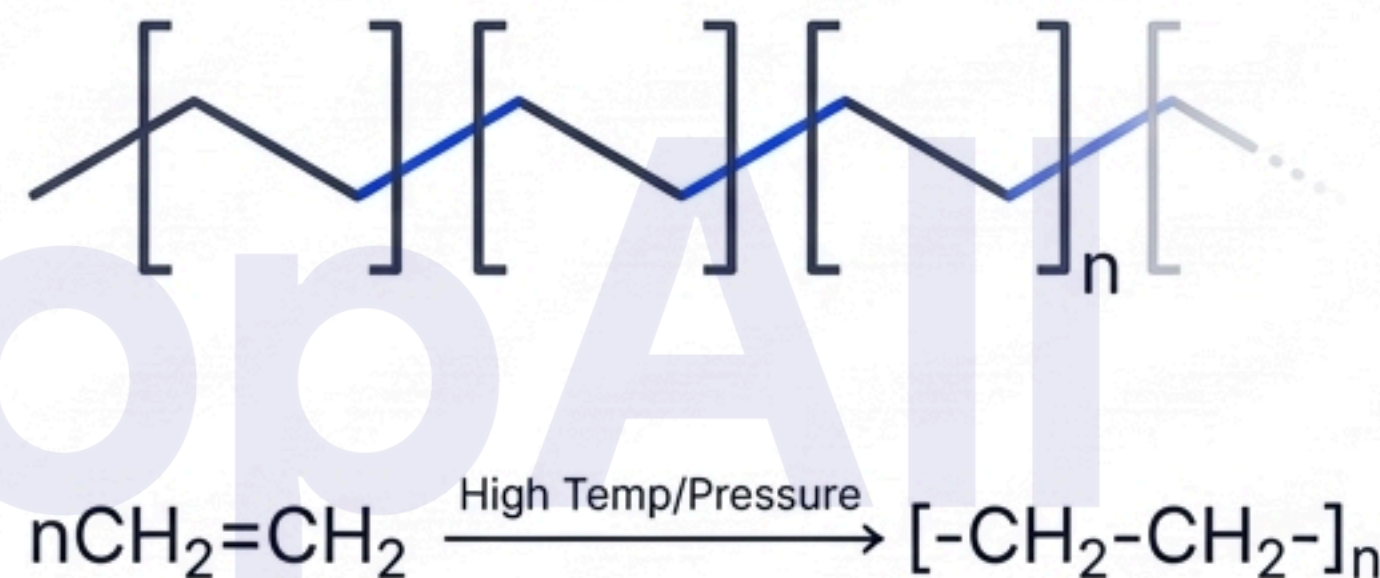
Beyond Addition: Cleavage & Aggregation

Ozonolysis (The Locator)



Cleaves C=C to map unknown structures.

Polymerisation (The Builder)



Links π bonds infinitely to create materials.

Key Takeaways:

1. π bonds are nucleophilic; their exposed electrons attract electrophiles.
2. Regioselectivity (Markovnikov) is entirely driven by thermodynamic stability (carbocation intermediates).
3. Changing conditions (adding peroxides) can fundamentally rewrite a mechanism from ionic to radical.



You've Learned the Theory.

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