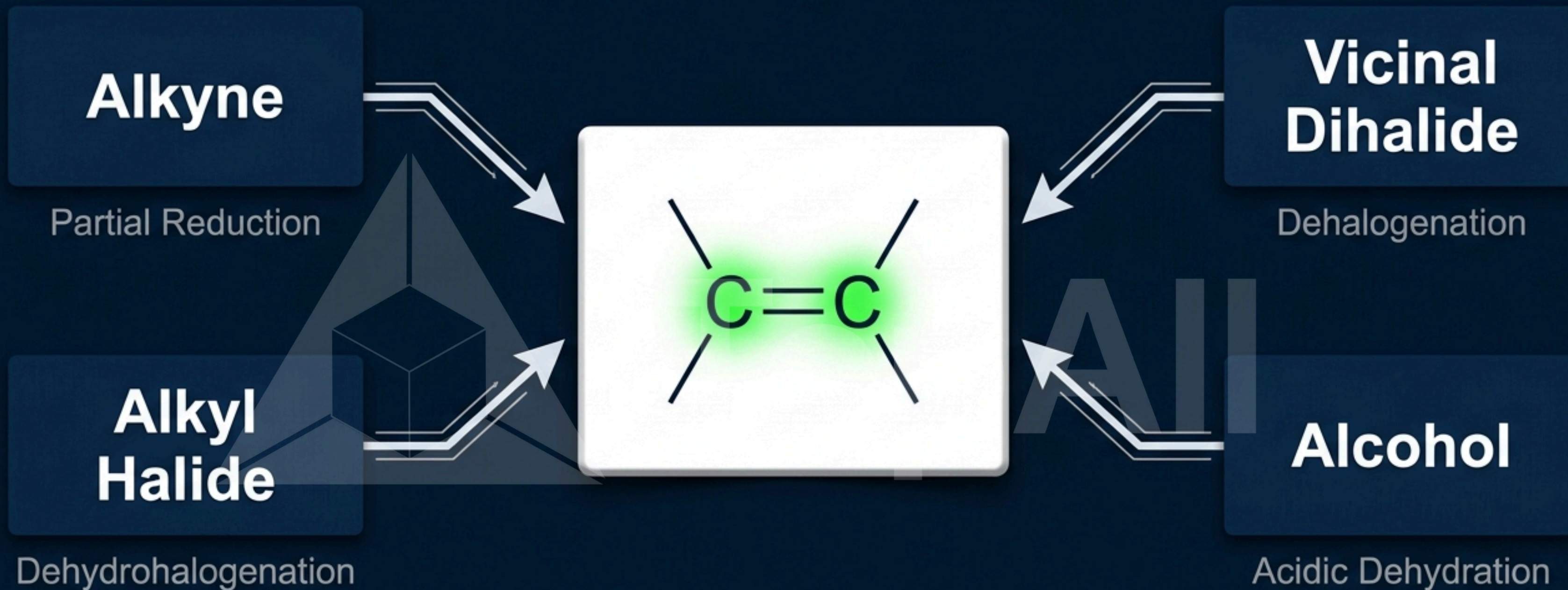
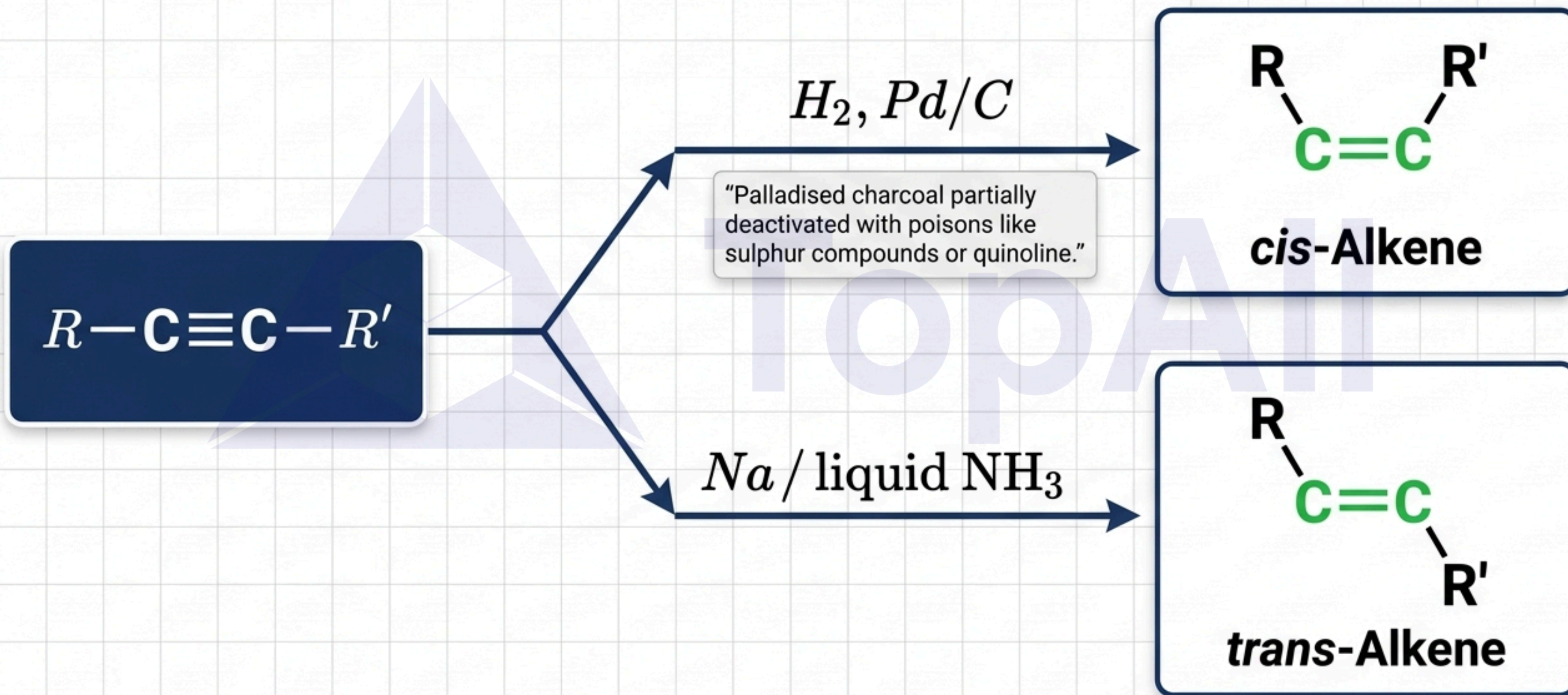


Preparation of Alkenes | Build the Double Bond

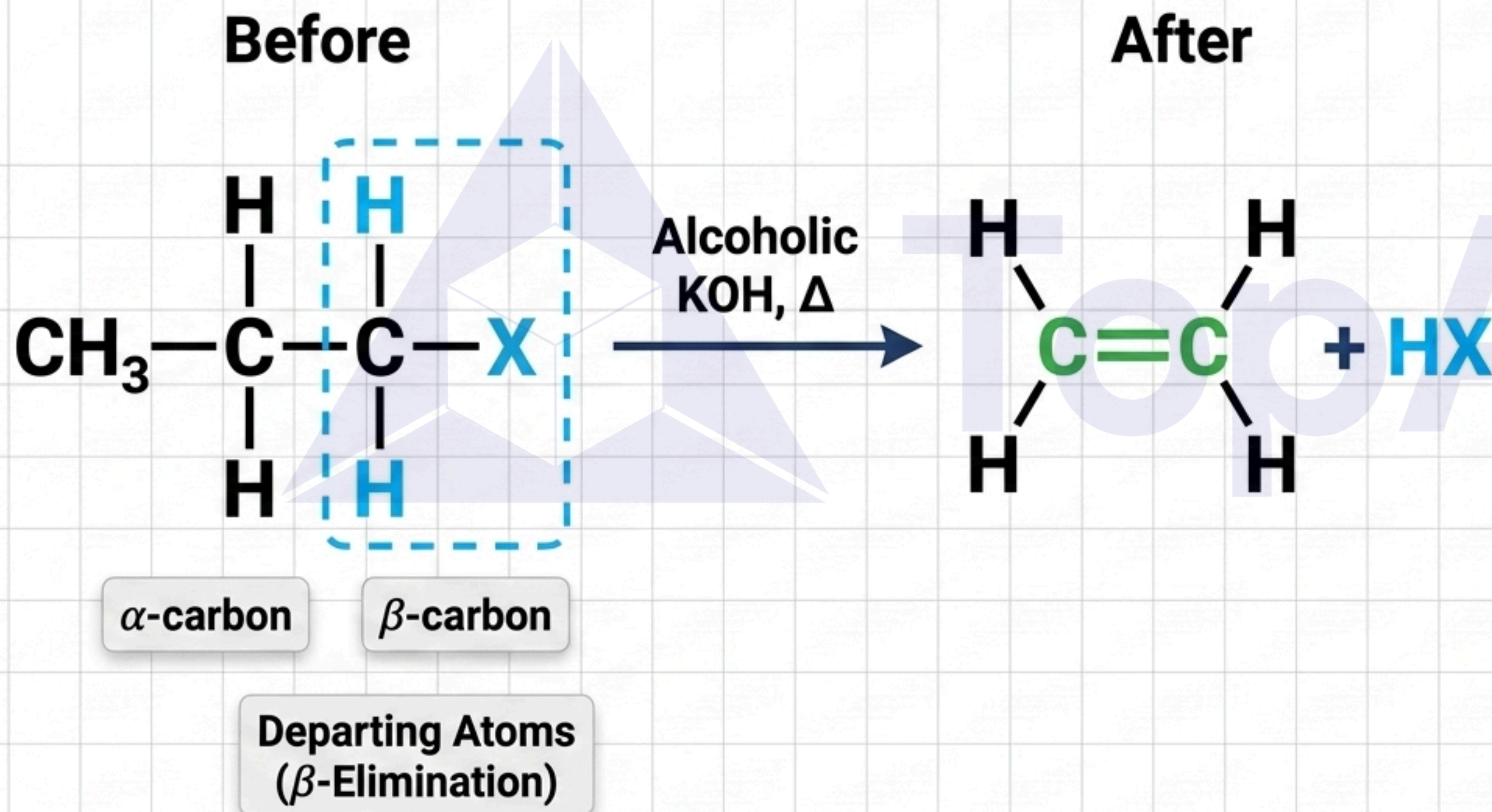


The **Molecular Blueprint**: 4 distinct pathways to engineer a carbon-carbon double bond.

Pathway 1: Partial Reduction of Alkynes



Pathway 2: Dehydrohalogenation of Alkyl Halides



Reaction Rates

Halogen leaving group:



Alkyl group structure:

Tertiary > Secondary > Primary



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Let's Test Them Now.**

$$E=mc^2$$



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Key Highlights

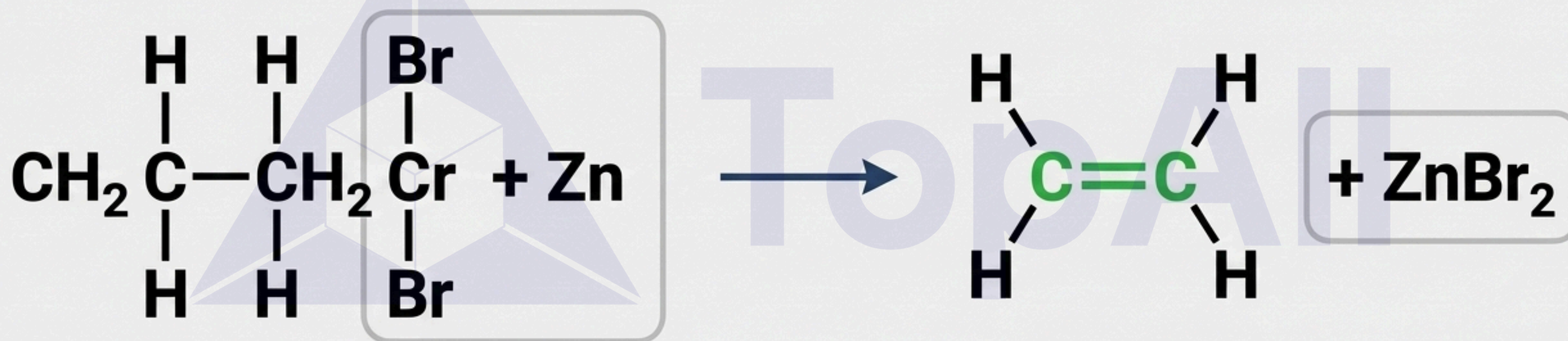
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Pathway 3: Dehalogenation of Vicinal Dihalides

Vicinal = Halogens on adjacent carbon atoms.

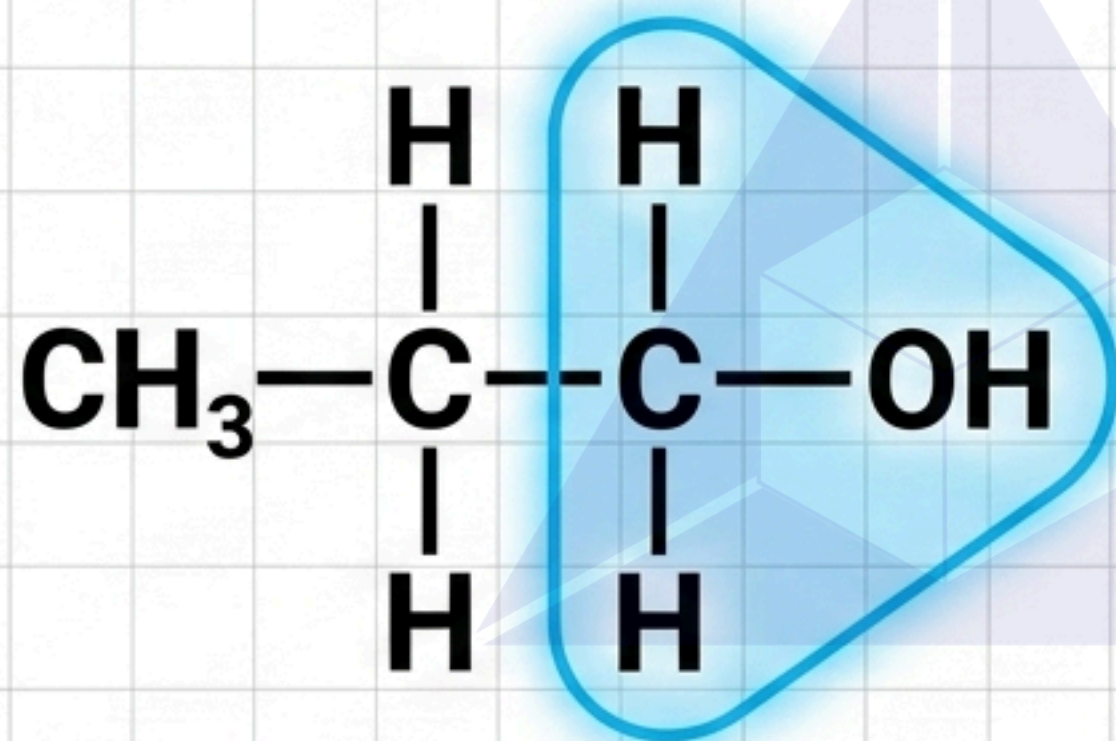
Reaction Anatomy Block



Example: Propene formation

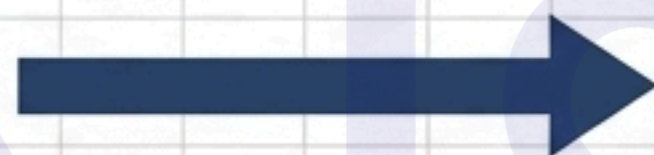
Pathway 4: Acidic Dehydration of Alcohols

Before



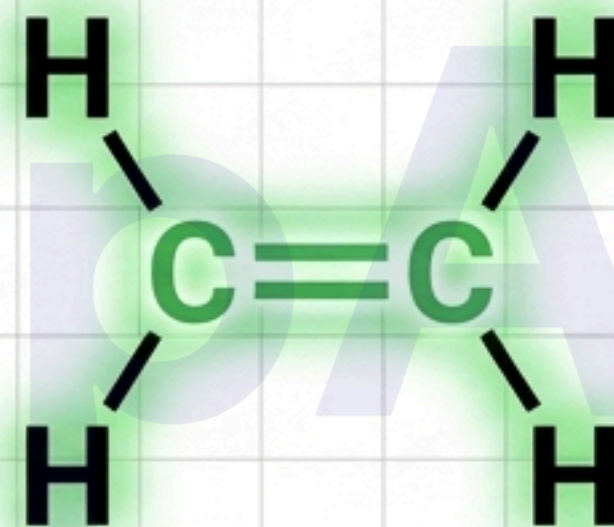
β-elimination reaction

conc. H_2SO_4 , Δ



*Elimination of a
water molecule*

After



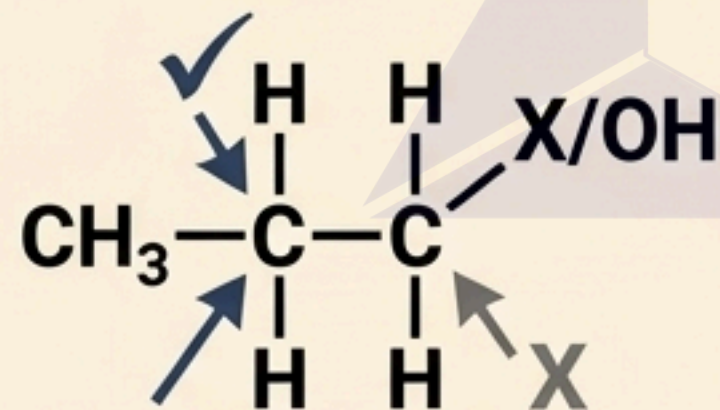
+ H_2O

Examiner Traps & Key Distinctions

⚠ Amber Warning ⚠

Identify the β -Carbon

Elimination must remove a hydrogen from the β -carbon (adjacent to the halogen/OH), **NOT** the α -carbon.



Dehydrohalogenation

Substrate:
Alkyl Halide

Reagent:
Alcoholic KOH

Byproduct:
HX

Dehydration

Substrate:
Alcohol

Reagent:
Conc. H_2SO_4 , Heat (Δ)

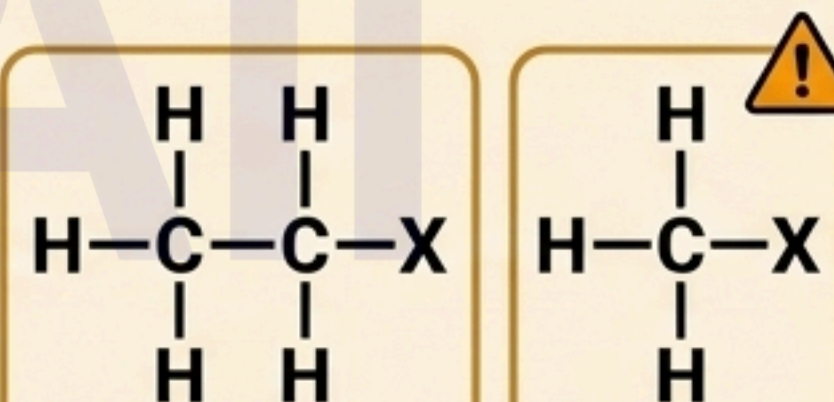
Byproduct:
 H_2O

⚠ Amber Warning ⚠

Vocabulary Matters:

Vicinal = Adjacent carbons.

(Note: Geminal = Same carbon)



Vicinal

Geminal

All four methods are essentially elimination reactions engineered to collapse single bonds into a stable $\text{C}=\text{C}$ double bond.



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