

FUNDAMENTAL CONCEPTS IN ORGANIC REACTION MECHANISMS

The Electromeric Effect (E Effect)

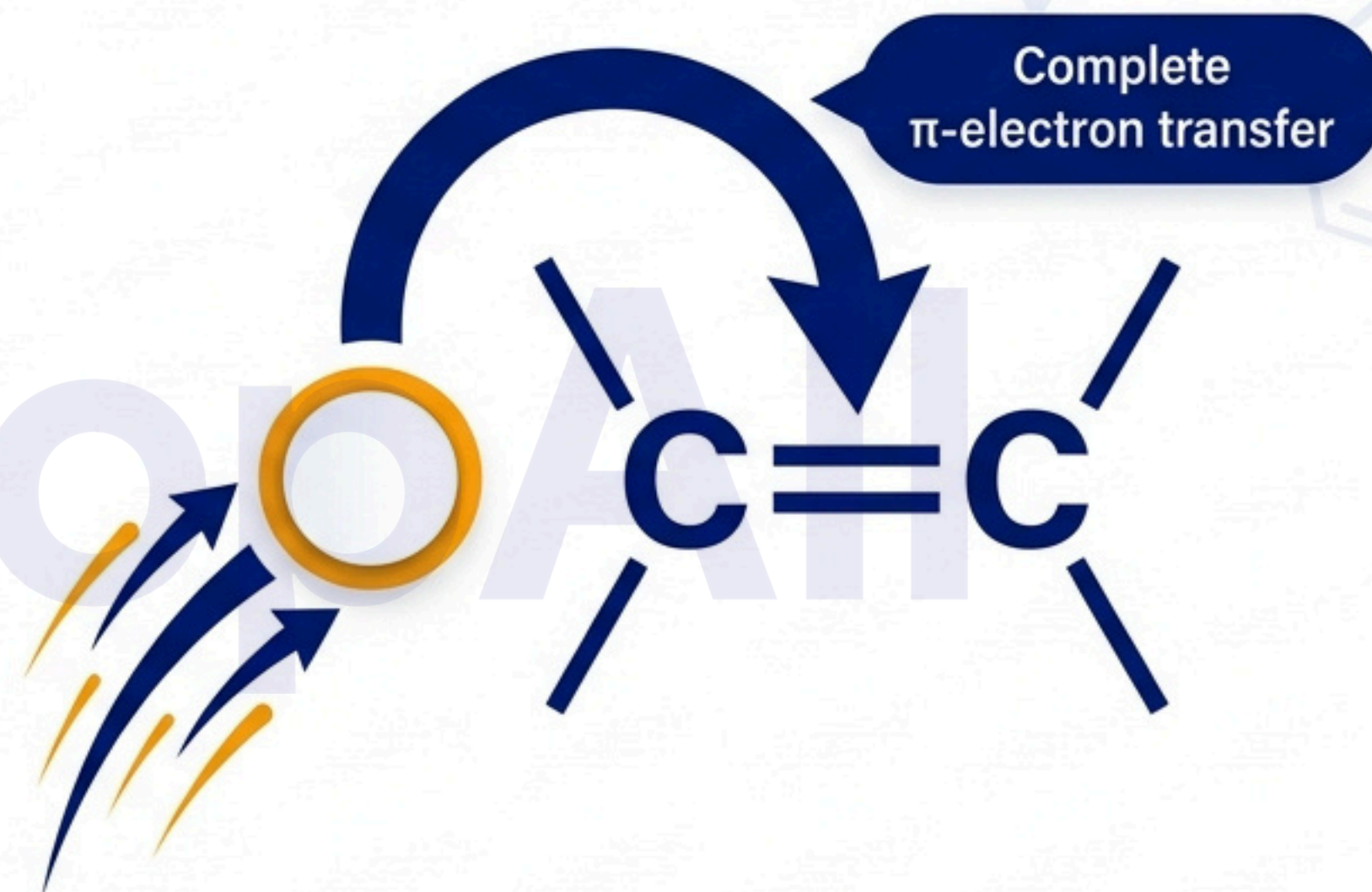
Temporary π -Electron Transfer

Understanding complete electron shifts in the presence of attacking reagents.

CORE DEFINITION

A Temporary State of Polarization

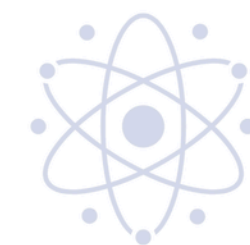
- Involves the **complete transfer** of a shared pair of π -electrons to one of the atoms joined by a multiple bond.
- **Strictly temporary**: The effect only appears in the presence of an attacking reagent.
- **Reversible**: The effect is annulled, and the molecule reverts to its original state, the moment the attacking reagent is removed from the domain of the reaction.





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$$E=mc^2$$



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Key Highlights

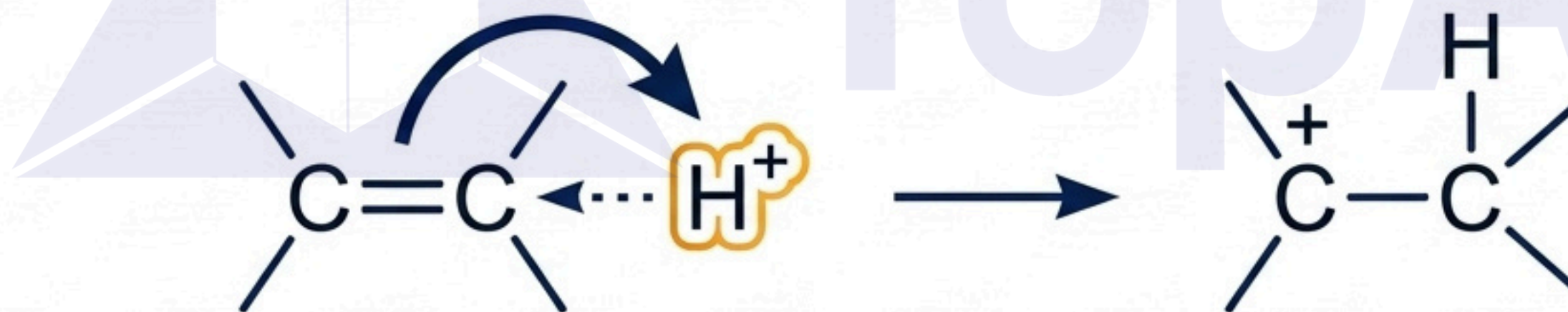
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MECHANISM PATHWAYS

Positive Electromeric Effect (+E)

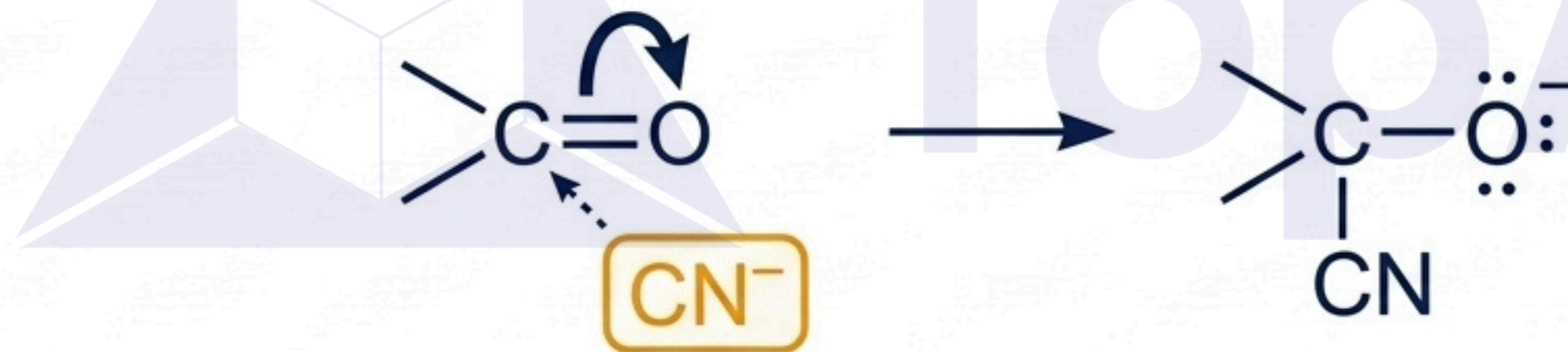
π -electrons of the multiple bond are transferred to the atom to which the attacking reagent gets attached.



Electrons move **TOWARD** the **attacker**

Negative Electromeric Effect (-E)

π -electrons of the **multiple** bond are transferred to the atom to which the attacking reagent does not get attached.



Electrons move AWAY from the attacker

Differentiating +E and -E Effects

Feature	+E Effect	-E Effect
Attacking Reagent	Typically Electrophiles (e.g., H^+)	Typically Nucleophiles (e.g., CN^-)
Electron Flow	Toward the point of attachment	Away from the point of attachment
Common Substrate	Alkenes ($>\text{C}=\text{C}<$)	Carbonyls ($>\text{C}=\text{O}$)

⚡ Rule of Dominance

When Inductive (I) and Electromeric (E) effects operate in opposite directions, the E Effect predominates.

SUMMARY

Essential Exam Takeaways



Strictly Temporary

The effect only exists while the attacking reagent is present. Remove the reagent, and the π -electrons revert to their original state.



Requires Multiple Bonds

Can only occur in compounds containing double or triple bonds, where highly mobile π -electrons are available for shifting.



Complete Transfer

Unlike the inductive effect (which is a partial shift), the E effect involves the absolute, complete transfer of a shared π -electron pair.



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