

UNIT 6 • HALOALKANES AND HALOARENES

Nature of the C–X Bond

The foundational mechanism driving
haloalkane reactivity.

**Halogen is more
electronegative
than carbon.**



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$$E=mc^2$$



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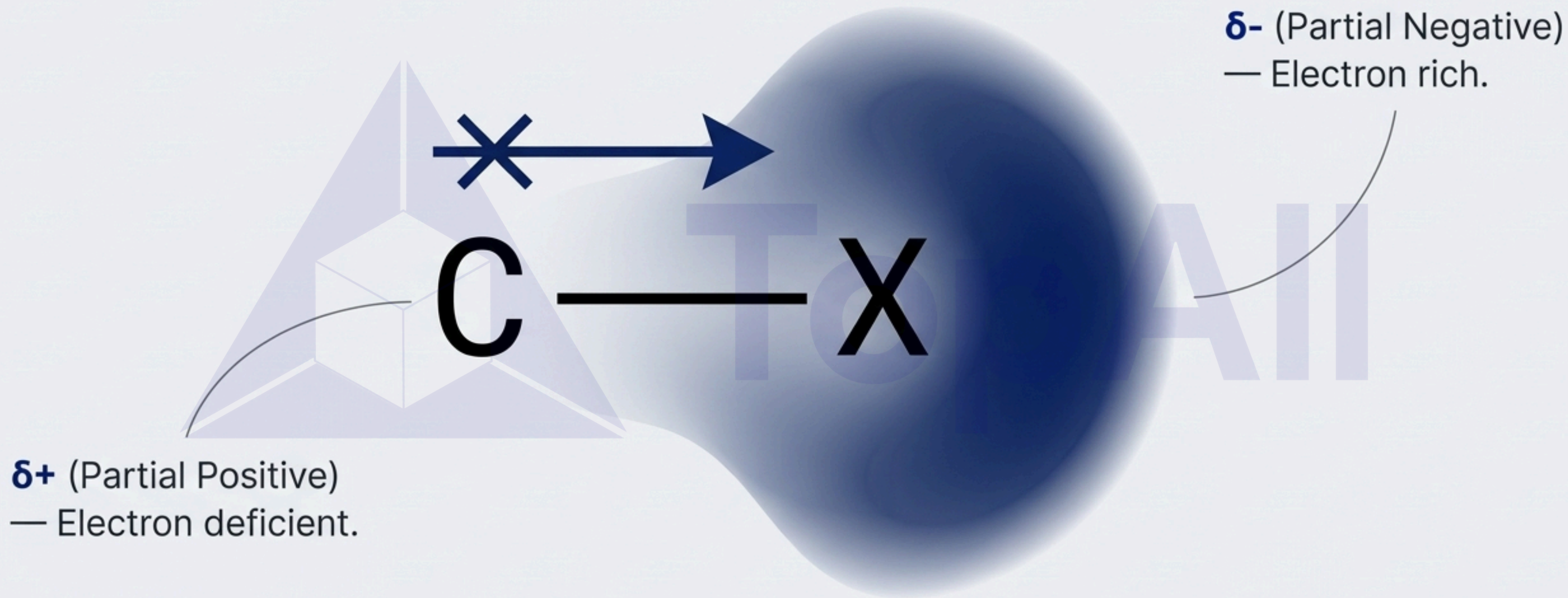
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Key Highlights

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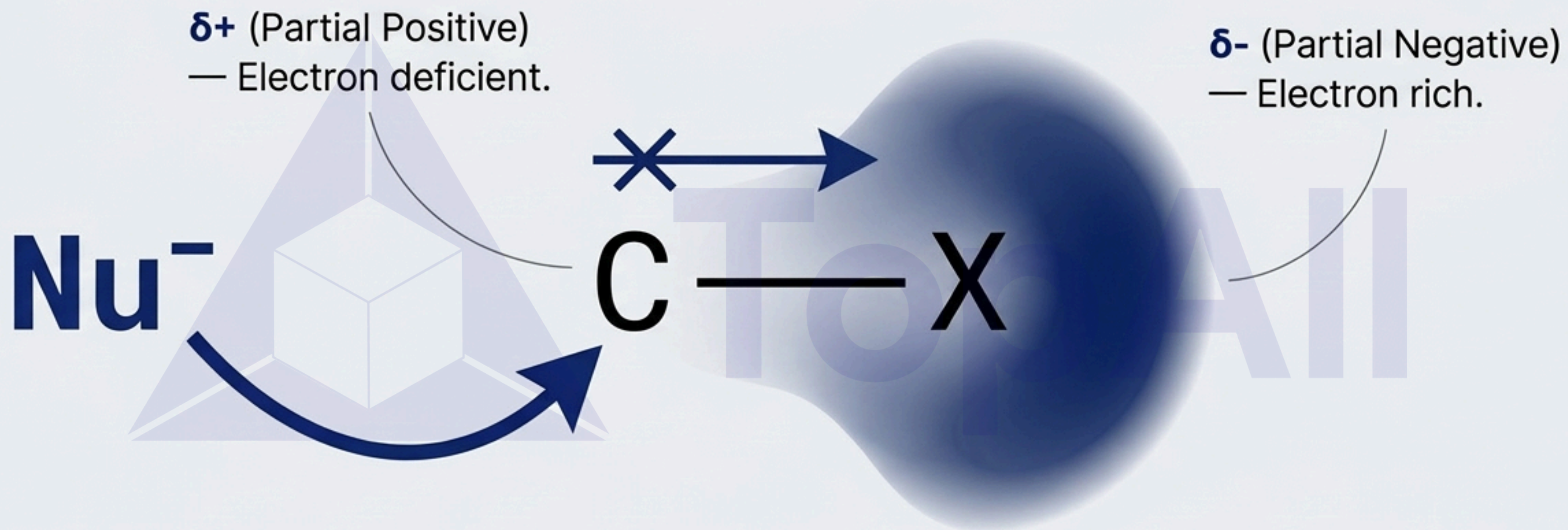


Electron Tug-of-War



The electronegativity difference shifts electron density toward the halogen, polarizing the bond.

Preview: Why this matters



Because the carbon is electron-deficient ($\delta+$), it acts as a magnet for electron-rich species (nucleophiles). This sets the stage for Nucleophilic Substitution.

Watch for this Conceptual Trap

It is easy to memorize that carbon is $\delta+$. But the trap is forgetting why: the halogen's higher electronegativity.

	F	Cl	Br	I
Increasing Atomic Size 	Bond Length 139 pm			Bond Length 214 pm
	Enthalpy 452 kJ/mol			Enthalpy 234 kJ/mol

As bond length increases, bond enthalpy drops—drastically altering how easily this bond breaks during reactions.

Key Takeaways

- ✓ **Electronegativity creates the dipole:** Halogens pull electron density away from carbon, creating a polarized $\text{C}(\delta+) - \text{X}(\delta-)$ bond.
- ✓ **Polarity drives reactivity:** The resulting electron-deficient carbon ($\delta+$) becomes the prime target for nucleophilic attack in upcoming substitution mechanisms.



You've Learned the Theory.

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