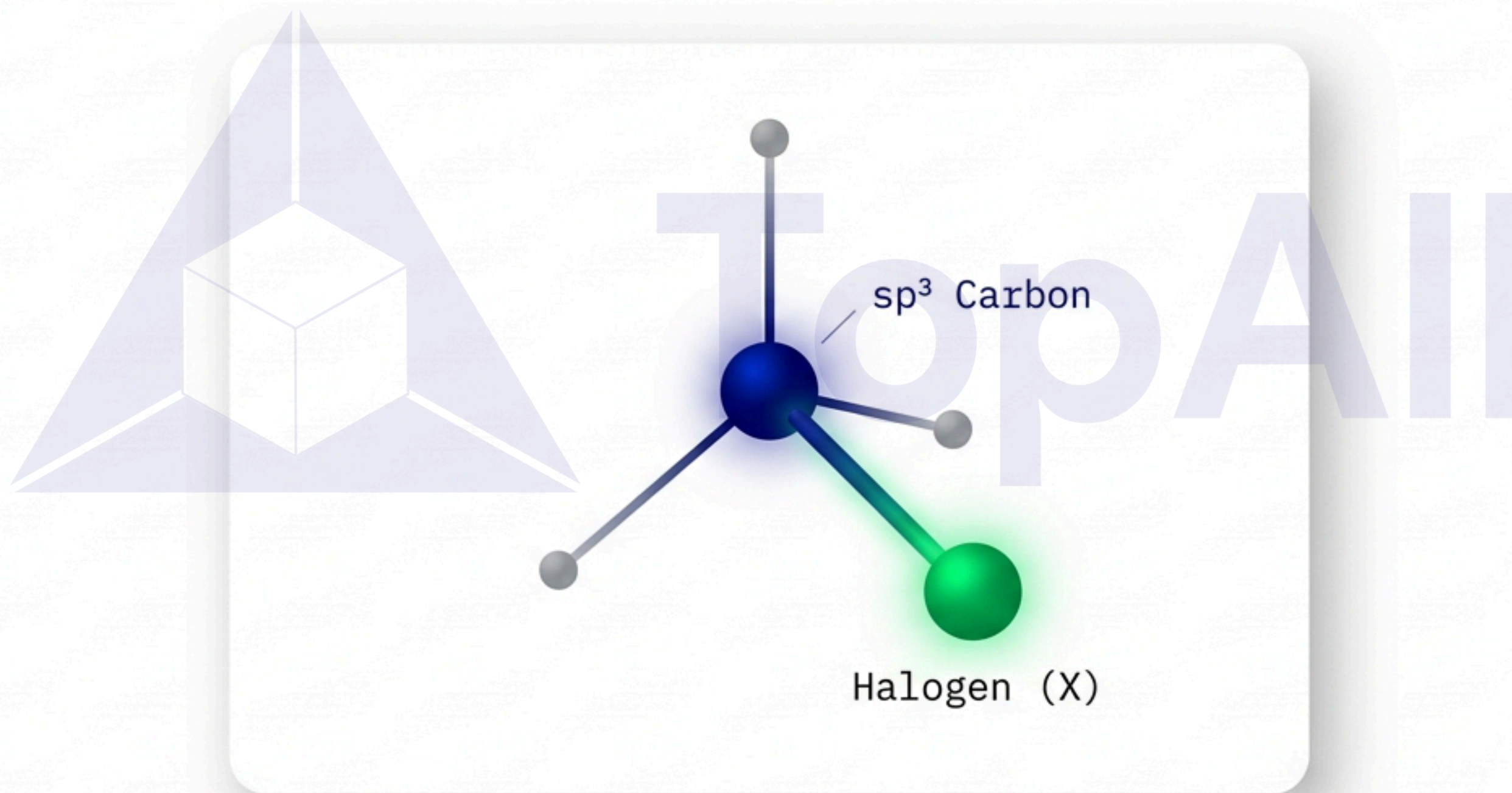
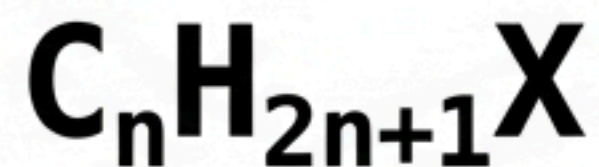


sp^3 C-X Bond: Alkyl, Allylic and Benzylic Halides



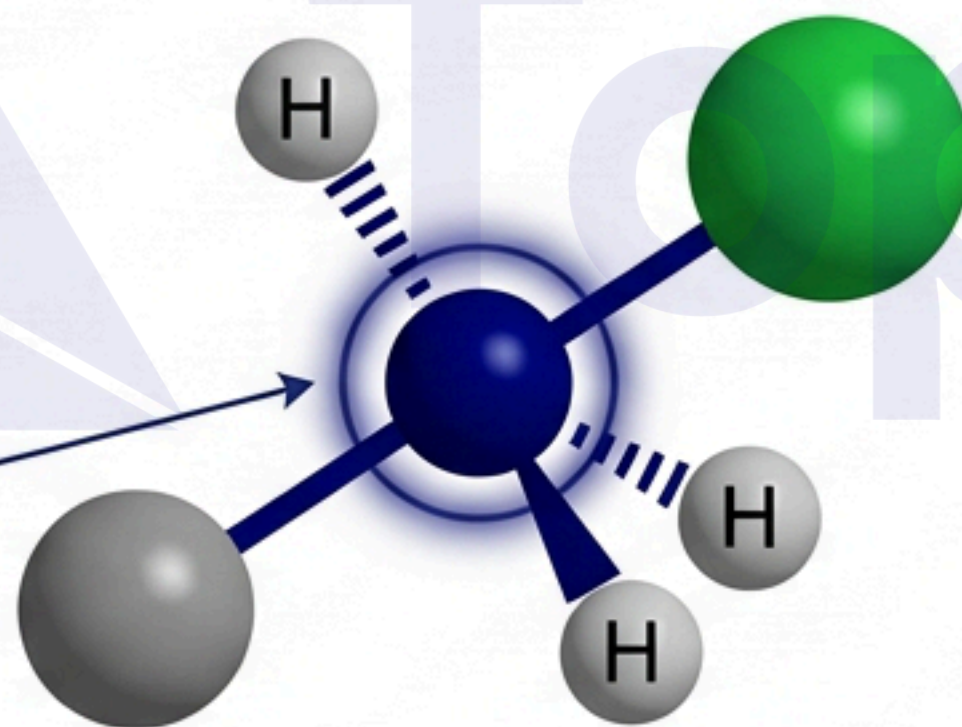
Alkyl Halides form the Foundation

In this homologous series, the halogen atom is bonded exclusively to an alkyl group.



Halogen Atom
(X: F, Cl, Br, I)

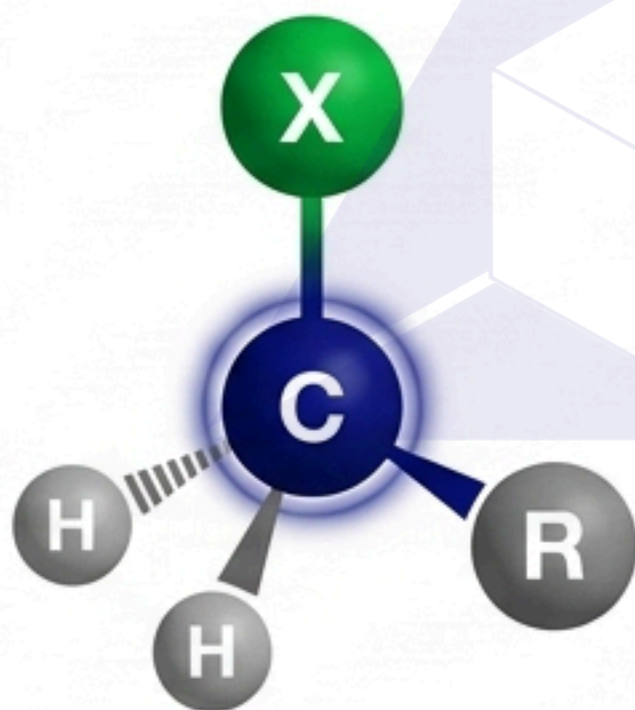
sp^3 Hybridized
Carbon



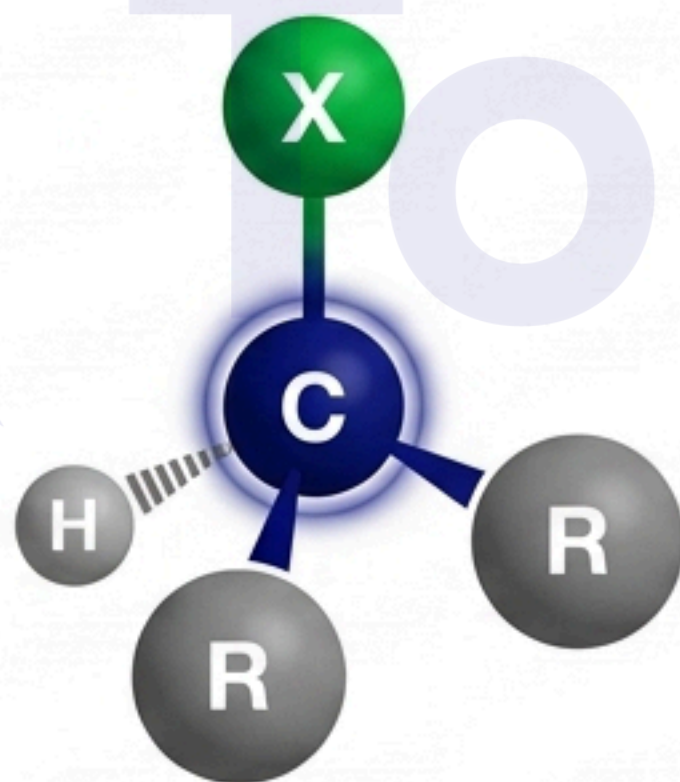
Degrees of Substitution

Alkyl halides are classified by the number of carbon atoms directly attached to the alpha-carbon.

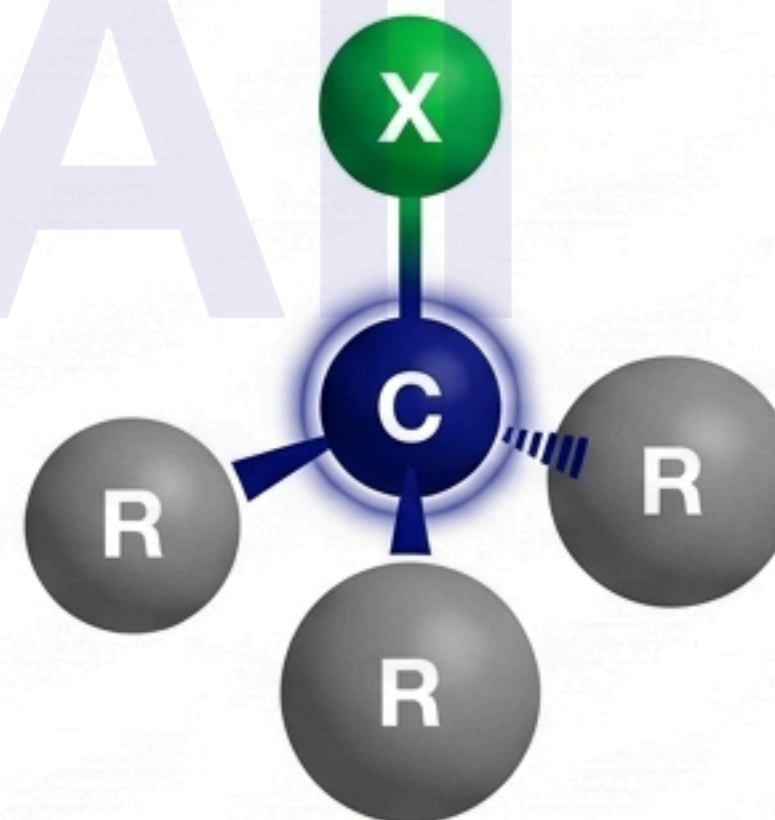
1° Alkyl Halide



2° Alkyl Halide



3° Alkyl Halide





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$$E=mc^2$$



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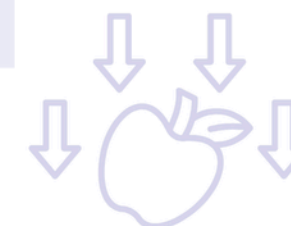
Practice Now



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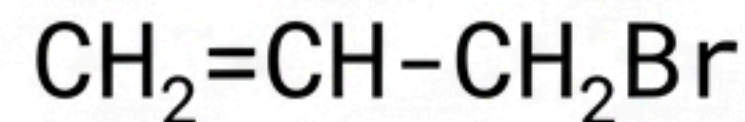
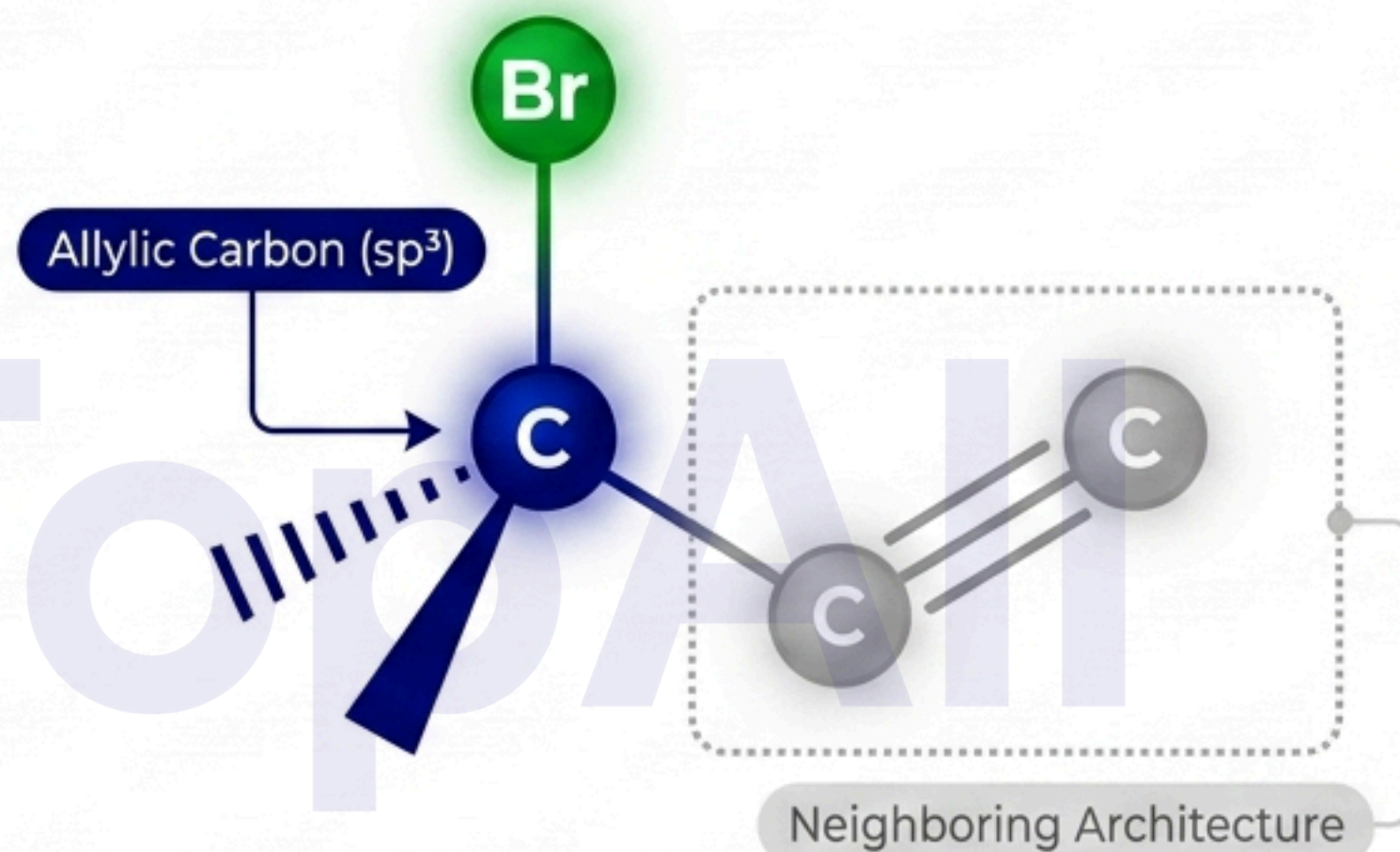
Key Highlights

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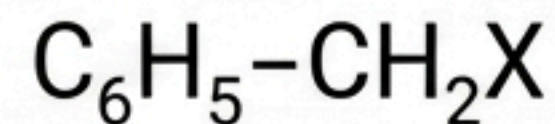
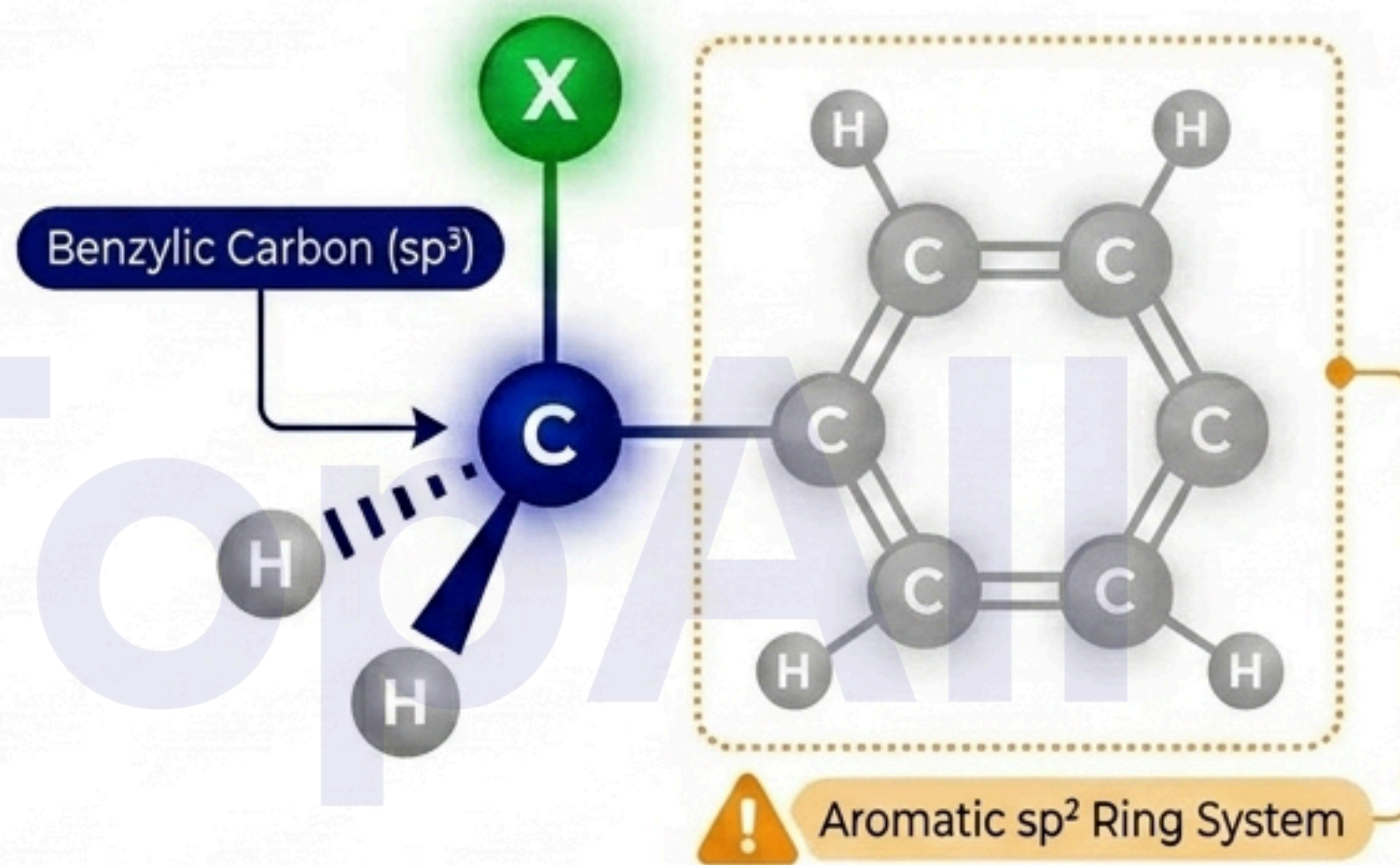
Allylic Halides: The Double Bond Neighbor

The halogen is bonded to an sp^3 -hybridized carbon atom that is positioned immediately adjacent to a C=C double bond.

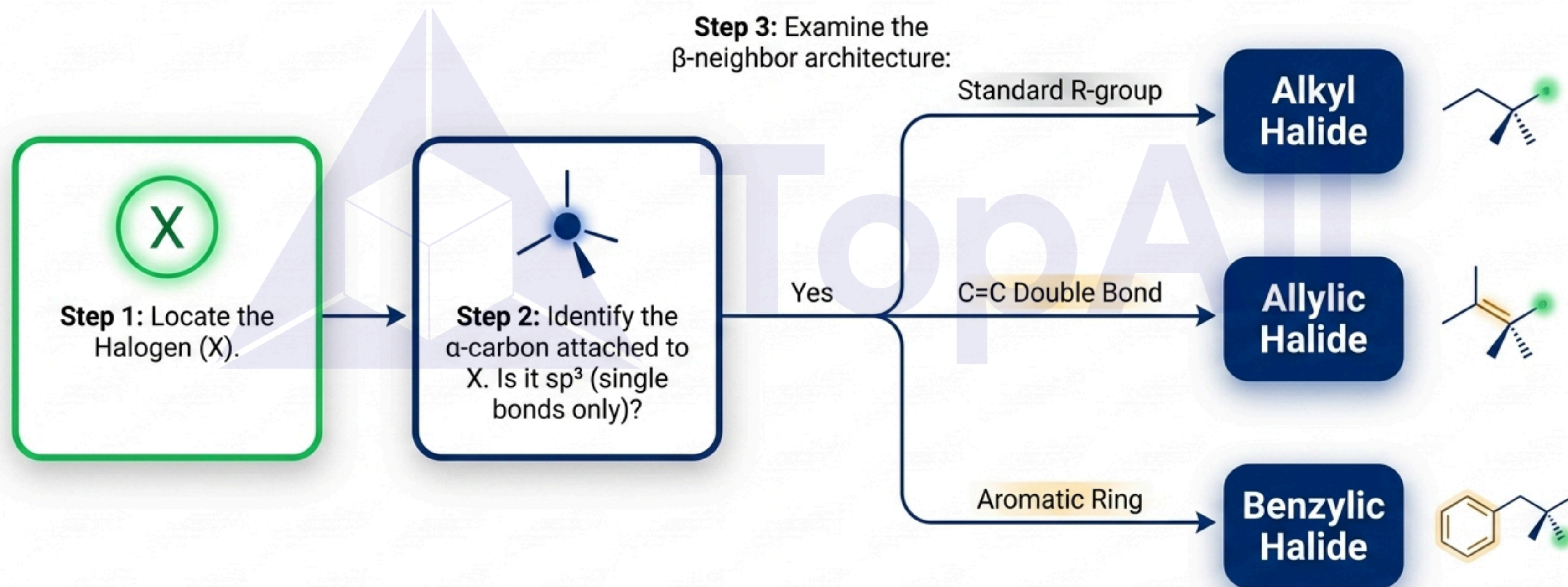


Benzylic Halides: The Aromatic Neighbor

The halogen is bonded to an sp^3 -hybridized carbon atom that is directly attached to an aromatic ring.



Diagnostic Flowchart for Molecule Identification

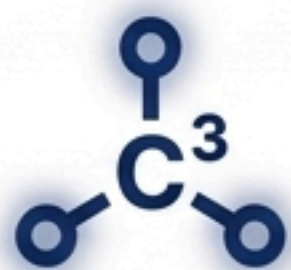


Key Structural Takeaways



The Base Rule: sp^3 C-X Bond

Halogens attached to tetrahedral, single-bonded carbons form the foundation of these three classes.



The Substitution Rule: 1° / 2° / 3° Classification

Determined entirely by the number of carbon atoms directly attached to the halogen-bearing alpha-carbon.



The Neighbor Rule: Allylic & Benzylic Context

The classification changes when the adjacent architecture features a double bond (Allylic) or an aromatic ring (Benzylic).



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