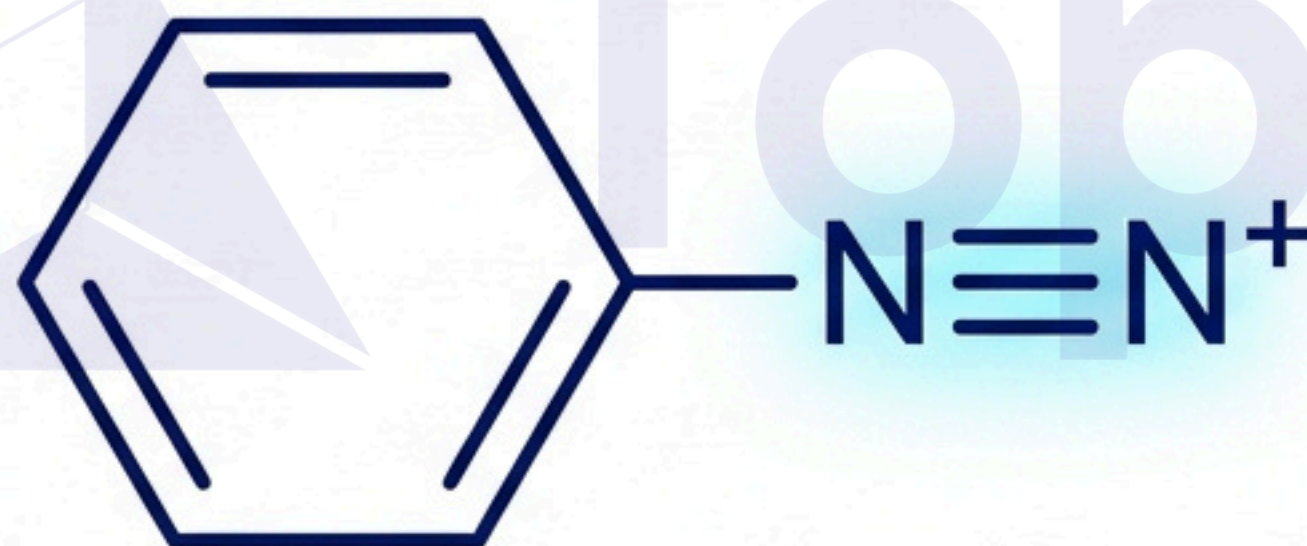


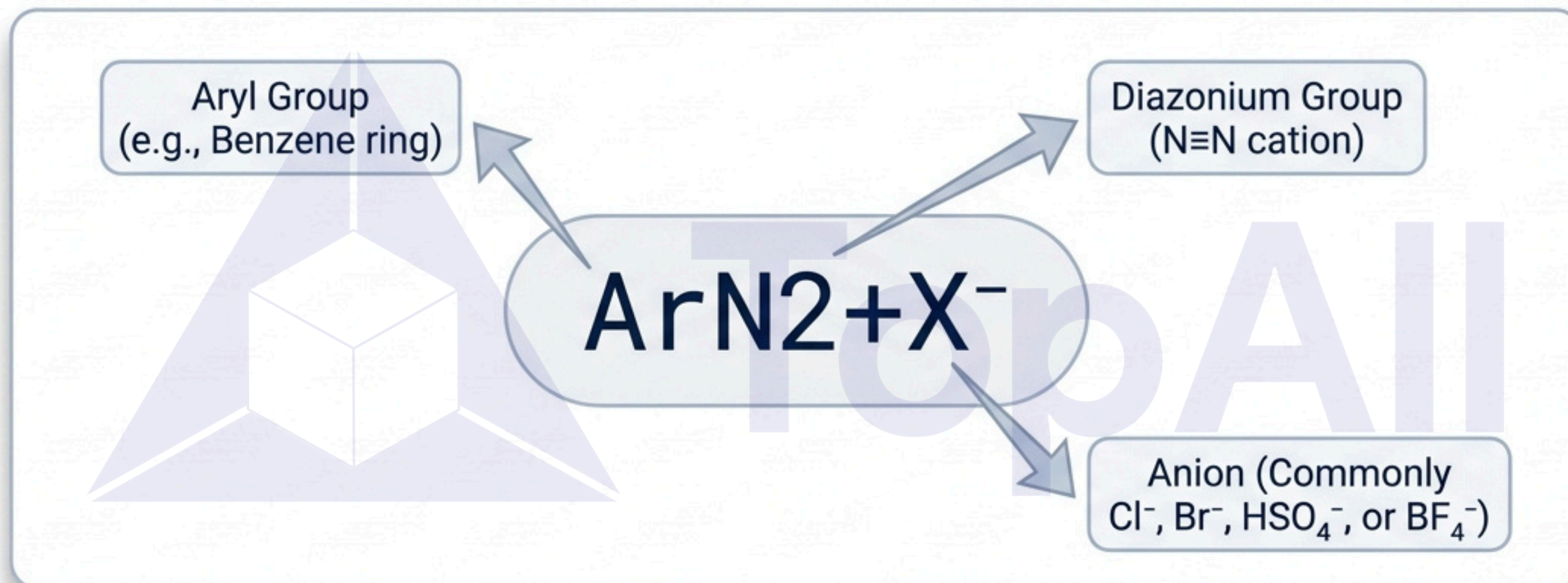
9.7 Method of Preparation of Diazonium Salts

A visual revision guide to diazotisation, reaction conditions, and intermediate stability



CONCEPT DEFINITION

Understanding the Diazonium Ion



Nomenclature Example



Benzenediazonium chloride

THE CORE PROCESS

What is Diazotisation?

The chemical conversion of primary aromatic amines into diazonium salts.

Primary Aromatic Amine
(e.g., Aniline)

Reagents & Low Temp (273–278 K)



Arenediazonium Salt

Aliphatic vs. Aromatic Stability

Primary Aliphatic Amines

Form highly unstable alkyldiazonium salts that immediately decompose.

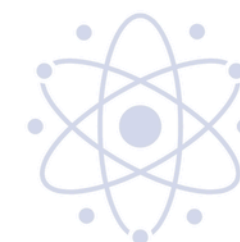
Primary Aromatic Amines

Form arenediazonium salts that are temporarily stable in cold solutions due to resonance stabilization.



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

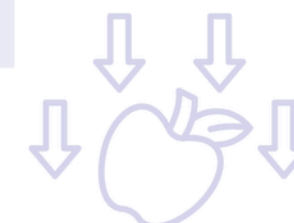
$$E=mc^2$$



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Key Highlights

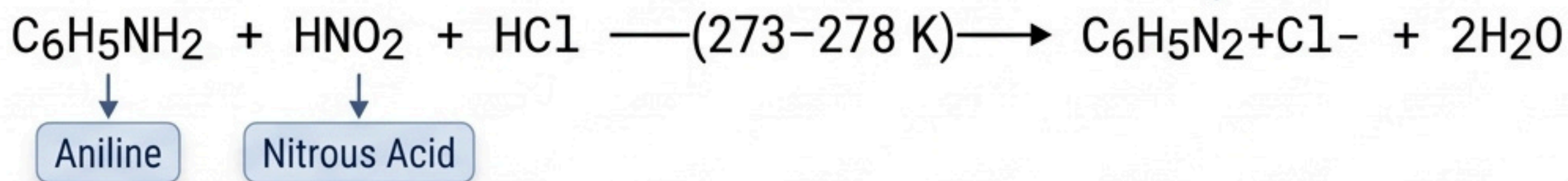
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Synthesizing Benzenediazonium Chloride

Nitrous acid is highly unstable and must be produced in situ.



Step 2 Card (Main Reaction Strip)



REACTION CONDITIONS

The 273–278 K Stability Window

0–5°C / 273–278 K
Stable Window

The arenediazonium ion is preserved. Stability is temporarily maintained by the dispersal of **positive charge over** the benzene ring via resonance.



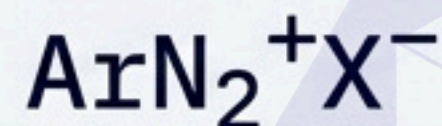
>5°C / >278 K
Decomposition

The short **stability window** closes. The salt decomposes easily; warming with water hydrolyzes it into phenol and liberates nitrogen (N₂) gas.

Rule of Thumb: Do not store. Prepare in cold and use immediately.

Diazonium Salts as Reactive Intermediates

The Identity



Readily soluble in water, colourless crystalline solid (decomposes easily in dry state).

The Preparation

Process: Aniline treated with $\text{NaNO}_2 + \text{HCl}$.

Condition: Strictly controlled at 273–278 K.

The Utility

Highly reactive intermediates. Crucial for introducing $-\text{F}$, $-\text{Cl}$, $-\text{Br}$, $-\text{I}$, $-\text{CN}$, or $-\text{OH}$ groups into aromatic rings (via Sandmeyer/Gattermann reactions) or forming conjugated azo dyes via coupling reactions.



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