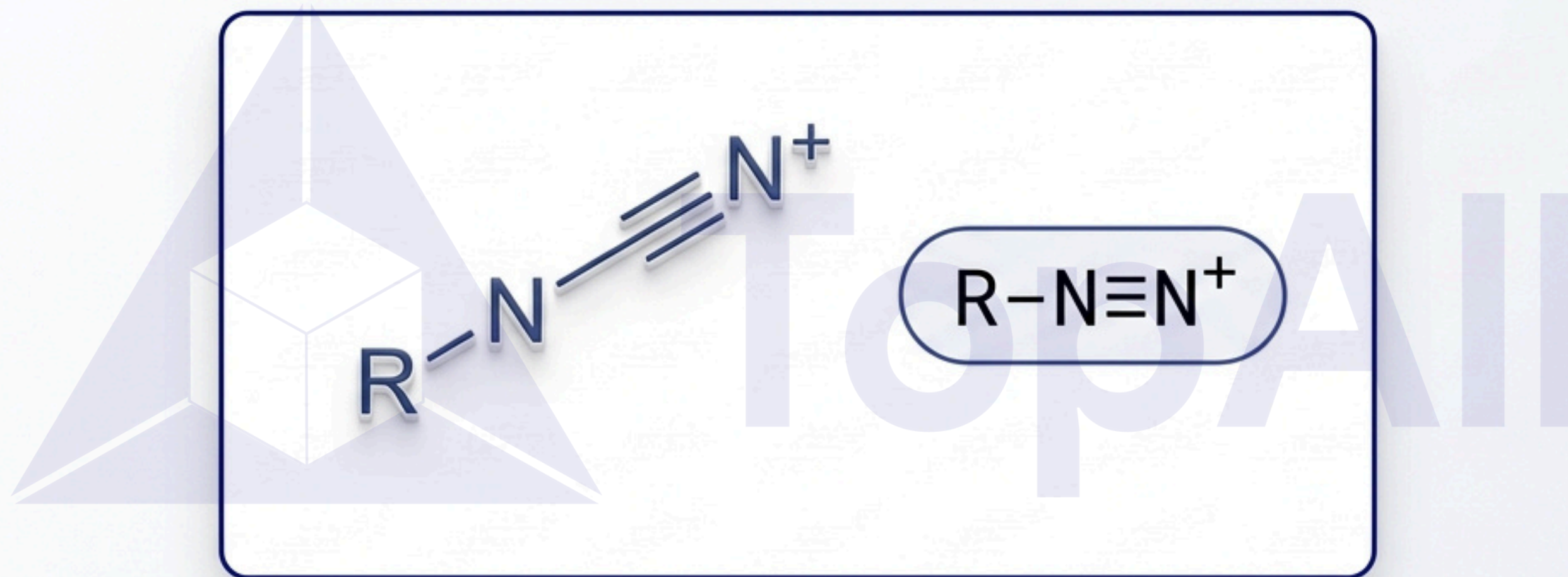


9.8 Physical Properties of Diazonium Salts



A high-yield diagnostic breakdown of solubility, thermal stability, and anion-dependent properties for competitive revision.

Benzenediazonium Chloride



State

Colorless crystalline solid at standard conditions.



[Solvation]

Solubility

Readily soluble in water.

[C₆H₅N₂⁺ Cl⁻]

•

[Type: Ionic Salt]

Recap Behaves like a typical ionic salt in aqueous solutions due to its highly polar nature.



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$$E=mc^2$$



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TEMPERATURE DEPENDENCE

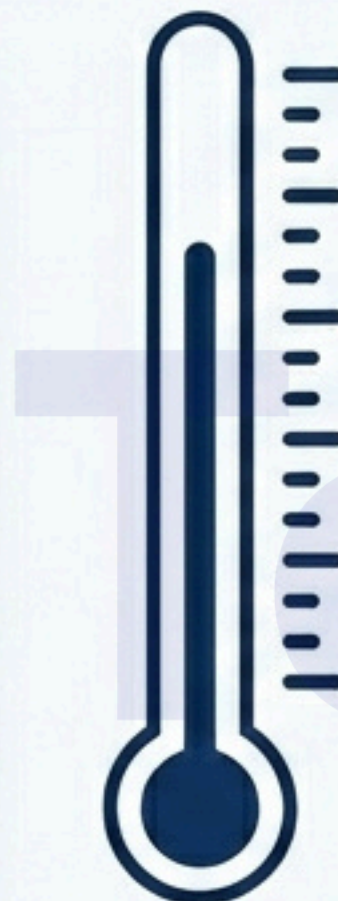
Stability in Cold vs Warm Conditions

[273 – 278 K]

[0 – 5 °C]

Stable.

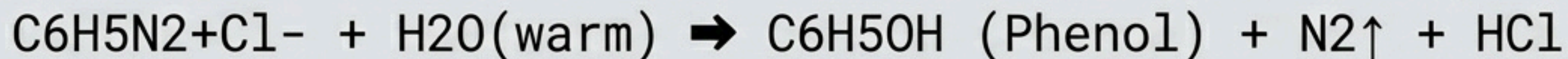
The diazonium group remains intact in aqueous solution.



[> 283 K]

Reacts.

Hydrolyzes readily when warmed.



Recap Temperature control is strictly required; warming forces the displacement of nitrogen gas.

Dry-State Instability



The Risk

Decomposes easily—and often explosively—in the dry state.

Laboratory Protocol

Never isolated or stored dry. Must be prepared in situ and used immediately following diazotization.

[Status: Highly Unstable]



[Action: Use immediately]

Recap

Hydration acts as a stabilizing buffer; removing the solvent triggers rapid decomposition.

Fluoroborate Comparison

Benzenediazonium Chloride (Cl ⁻)	Benzenediazonium Fluoroborate (BF ₄ ⁻)
[Soluble in Water] [Unstable at Room Temp]	[Water Insoluble] [Stable at Room Temp]

[C₆H₅N₂⁺ BF₄⁻]



Recap

Substituting the chloride ion for a bulky fluoroborate anion yields a water-insoluble salt stable enough to be stored at room temperature.



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