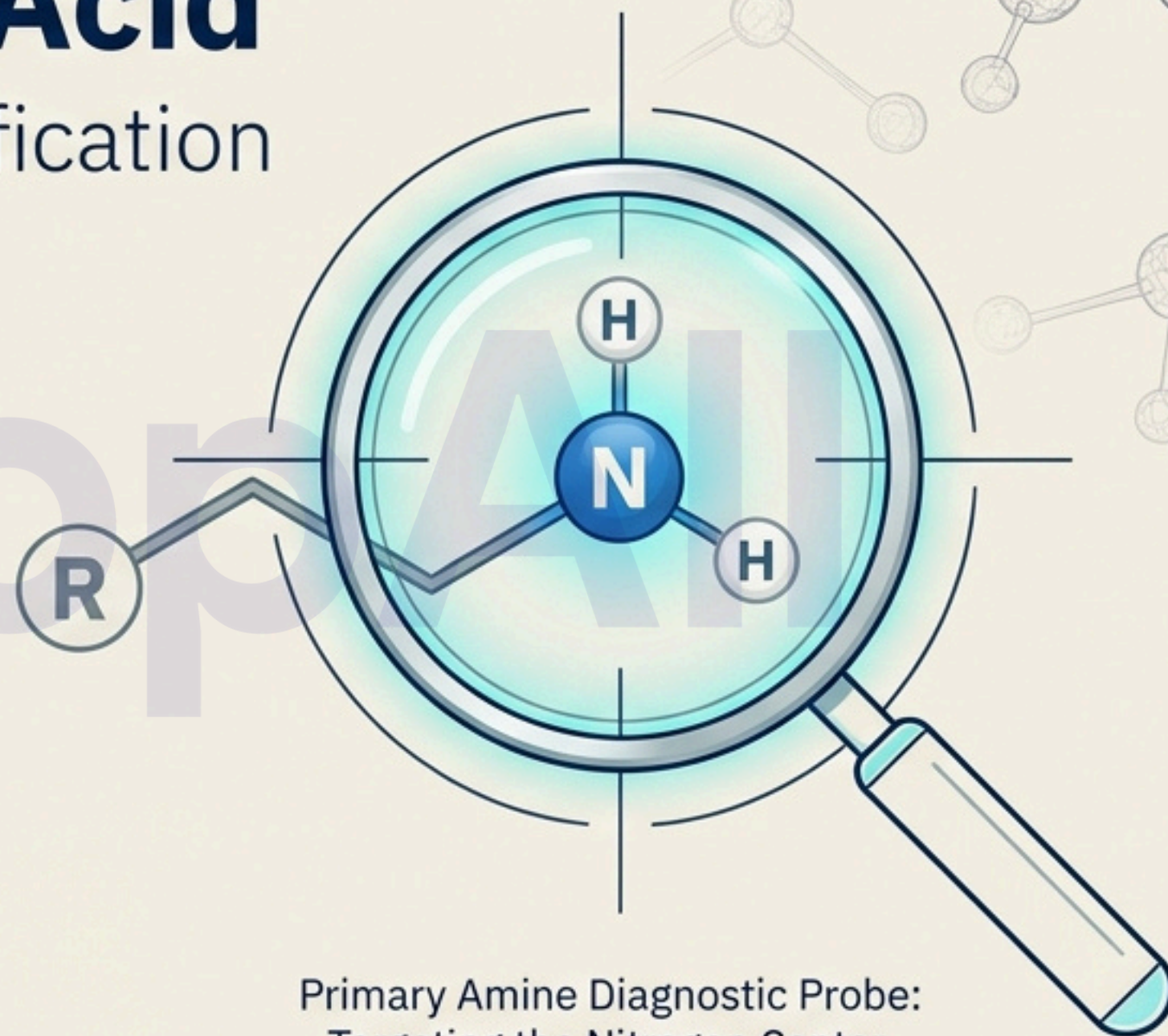


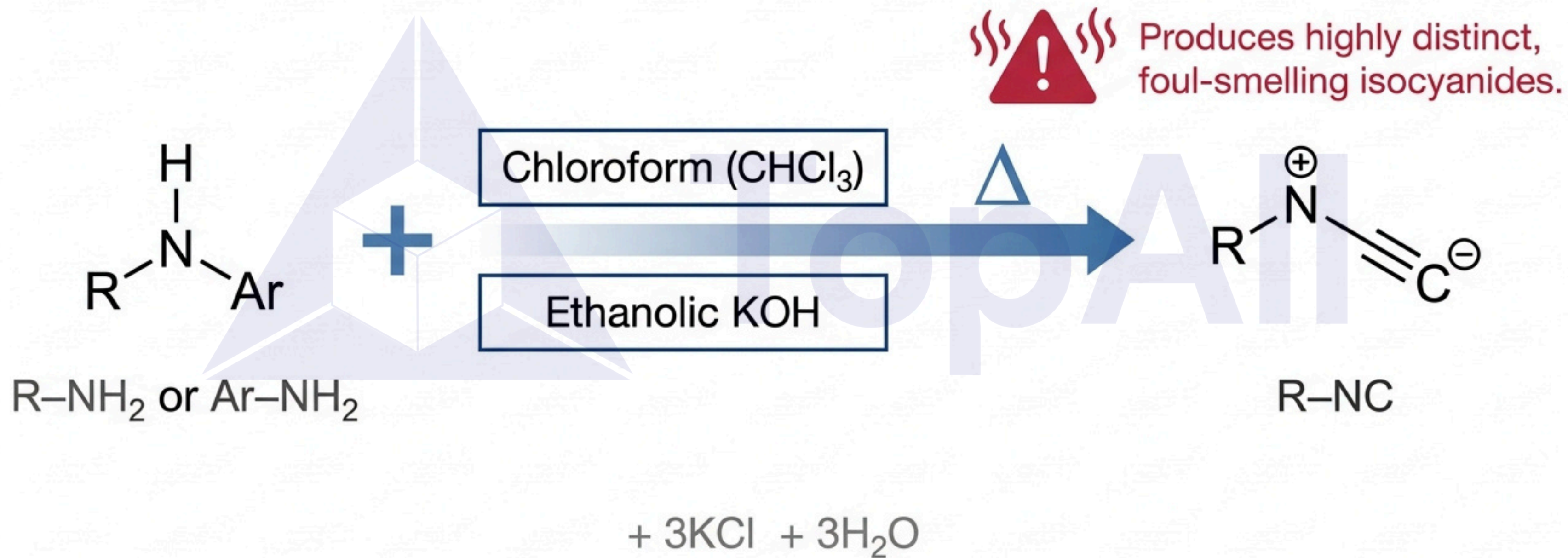
9.6.3 Carbylamine Reaction and Reaction with Nitrous Acid

A Diagnostic Toolkit for Amine Classification



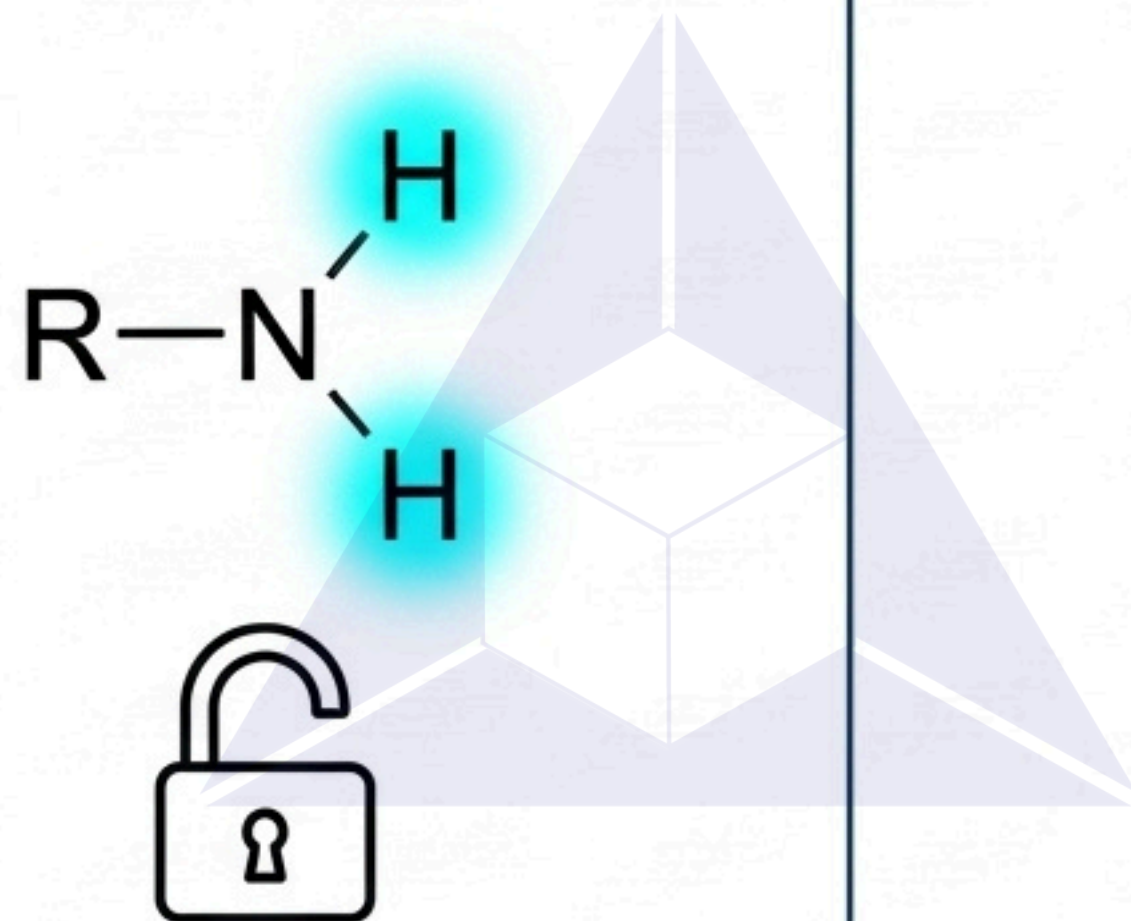
Primary Amine Diagnostic Probe:
Targeting the Nitrogen Center

The Carbylamine Test: A Binary Probe



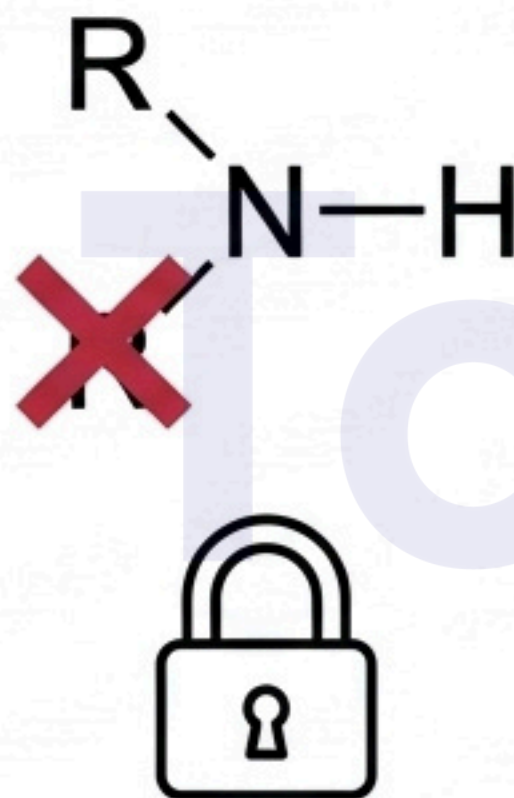
Diagnostic Specificity: The Two-Hydrogen Requirement

Primary Amine (1°)



Passes the test.

Secondary Amine (2°)



Pathway blocked.

Tertiary Amine (3°)



Pathway blocked.

Secondary and tertiary amines lack the required hydrogen atoms and DO NOT respond to the Carbtamine test.



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

$$E=mc^2$$



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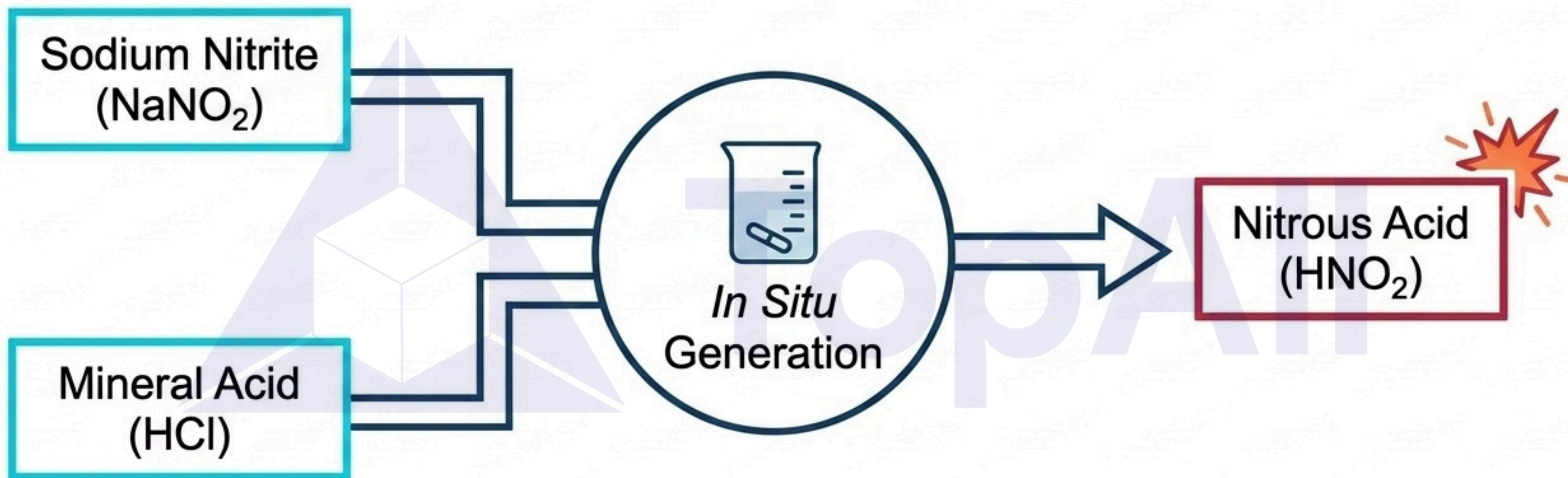
At prep.topall.app

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Nitrous Acid: The Granular Probe



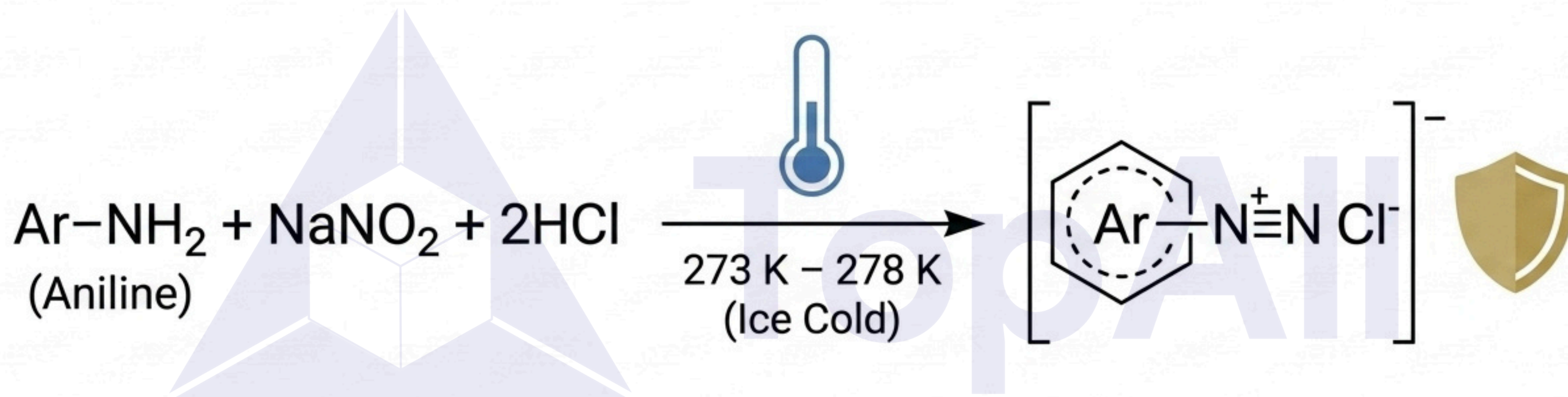
Nitrous Acid is too unstable to store. It must be generated directly inside the reaction mixture to act as a diagnostic probe.

Primary Aliphatic Amines + Nitrous Acid



Analytical Application: The quantitative evolution of N₂ gas is used to estimate amino acid and protein concentrations.

Primary Aromatic Amines + Nitrous Acid



At low temperatures, aromatic rings provide resonance stabilization, yielding a stable diazonium salt intermediate.

The Master Diagnostic Matrix

	1° Aliphatic	1° Aromatic	2° Amines	3° Amines
Carbylamine Test	 Isocyanide (Foul Smell)	 Isocyanide (Foul Smell)	 No Reaction	 No Reaction
Nitrous Acid Test	 N ₂ Gas Evolution + Alcohol	 Stable Diazonium Salt (273-278 K)	 Non-diazonium pathways	 Non-diazonium pathways



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