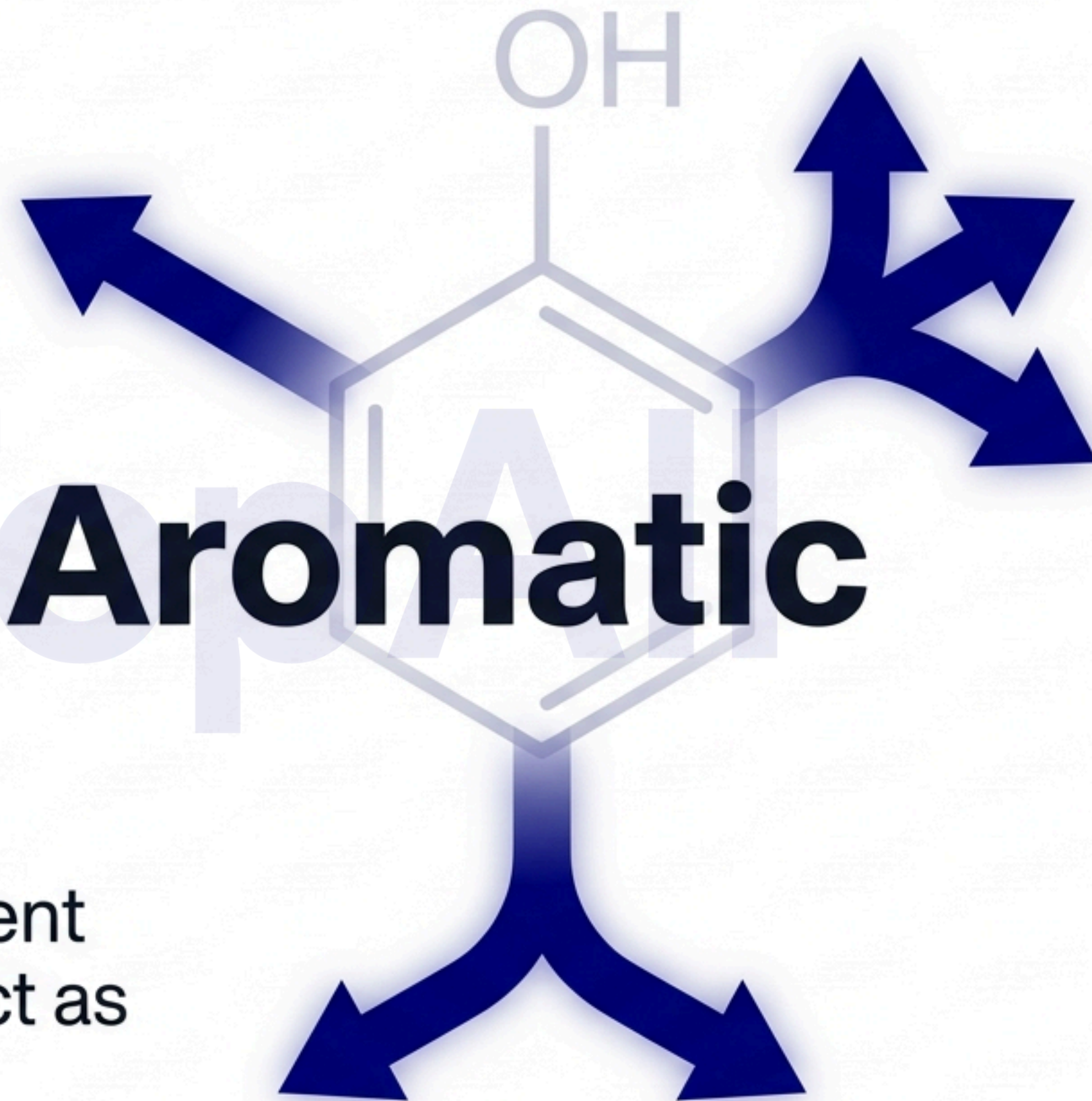


Reactions of Phenols: Electrophilic Aromatic Substitution

Taming an activated ring: How reagent concentration and solvent polarity act as control switches for substitution.



Activating Group

The -OH group pushes electron density into the benzene ring, making it highly reactive towards electrophiles.

Steam Distillation

A separation technique that isolates temperature-sensitive compounds based on their volatility (ability to vaporize).

Picric Acid

The common name for 2,4,6-trinitrophenol. A highly substituted, yellow, acidic compound formed under extreme reaction conditions.



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

$$E=mc^2$$



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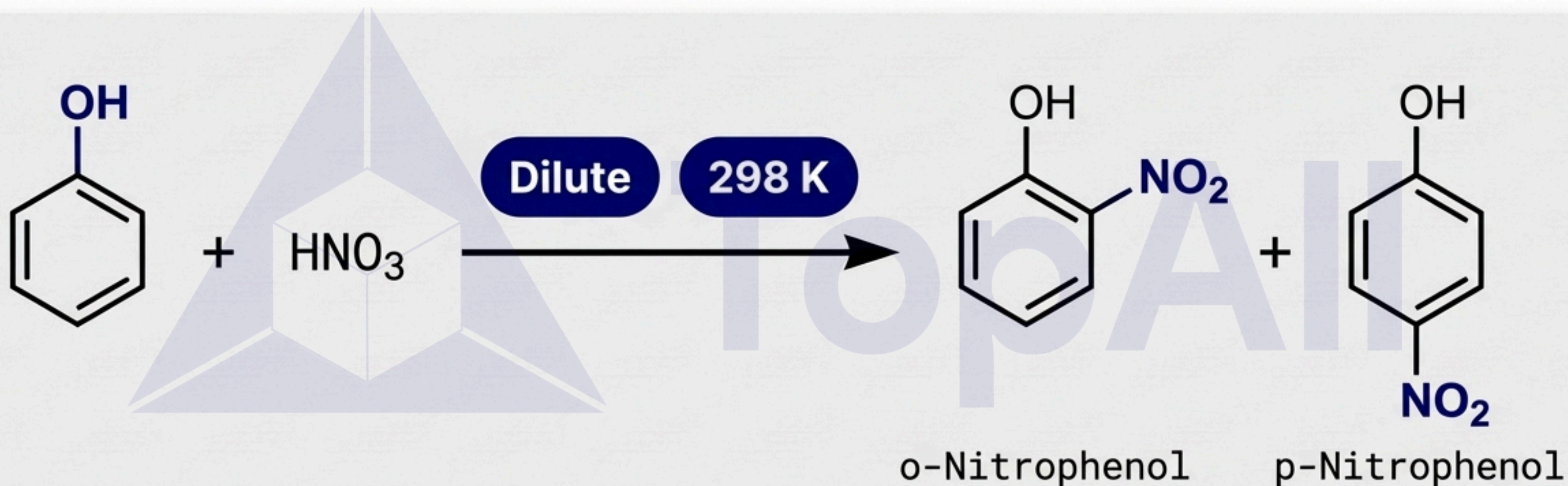
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Key Highlights

- » Free Study Material, Videos & Infographics
- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter



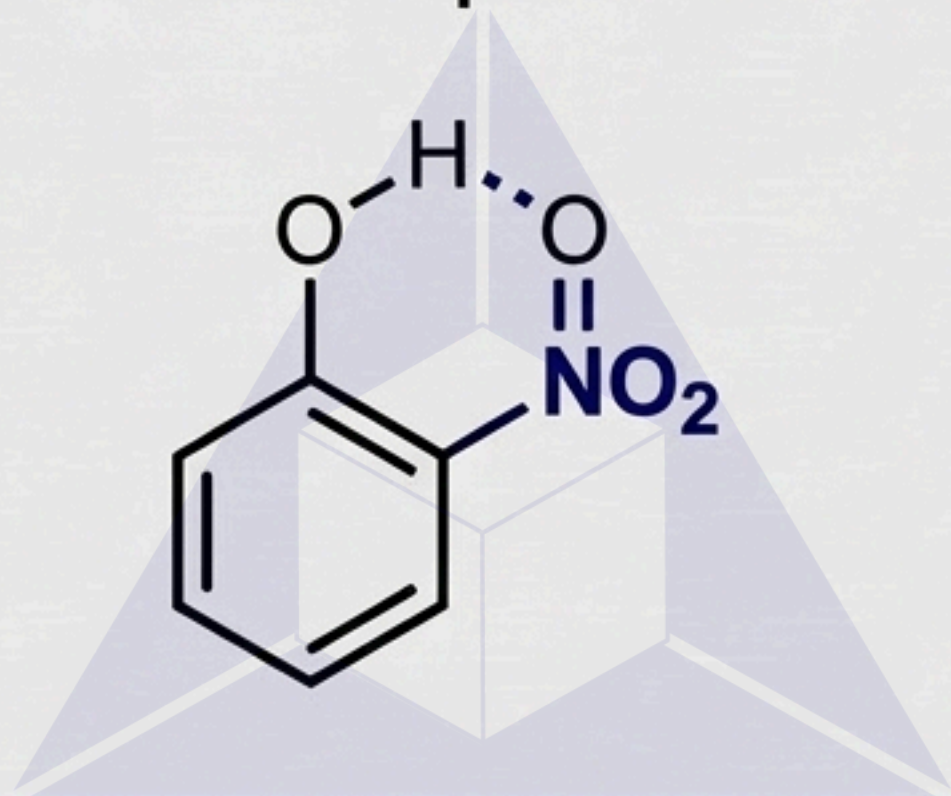
The Tamed Reaction: Mononitration



Yields a mixture of ortho and para isomers. How do we separate them? →

Separation by Steam Distillation

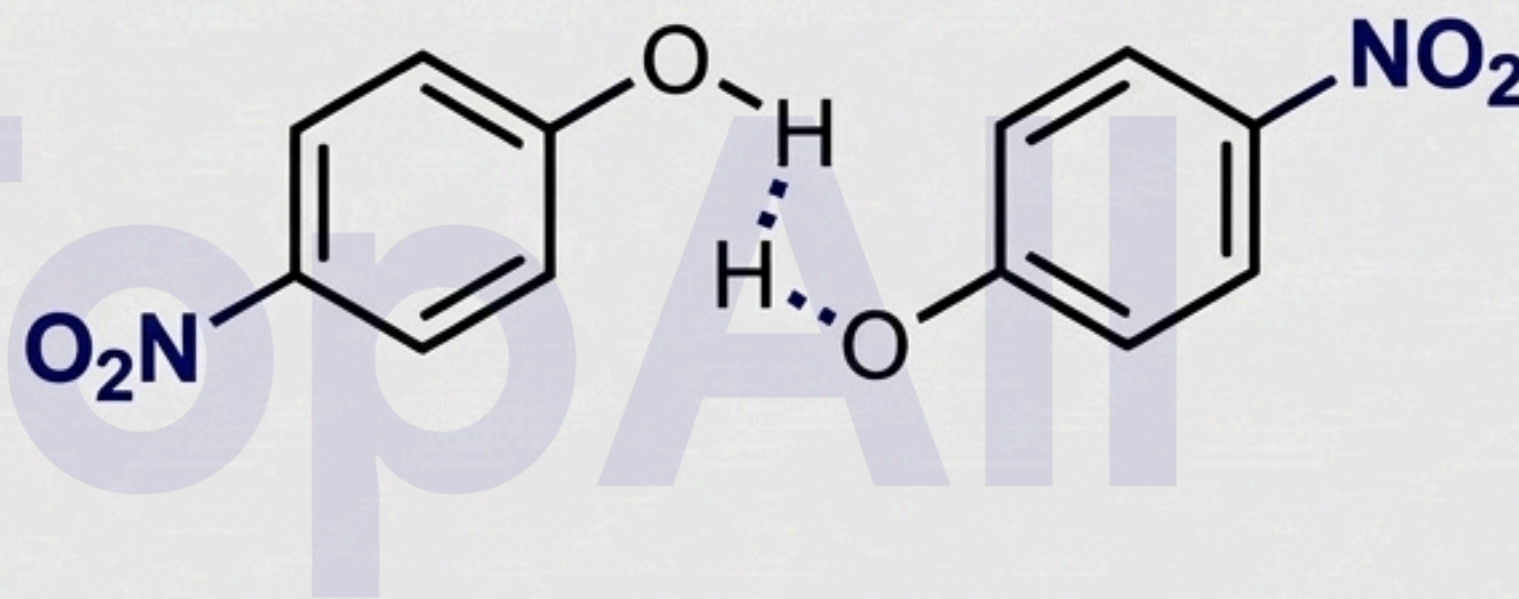
o-Nitrophenol



Intramolecular H-bonding

Steam Volatile (molecules remain independent, easier to vaporize).

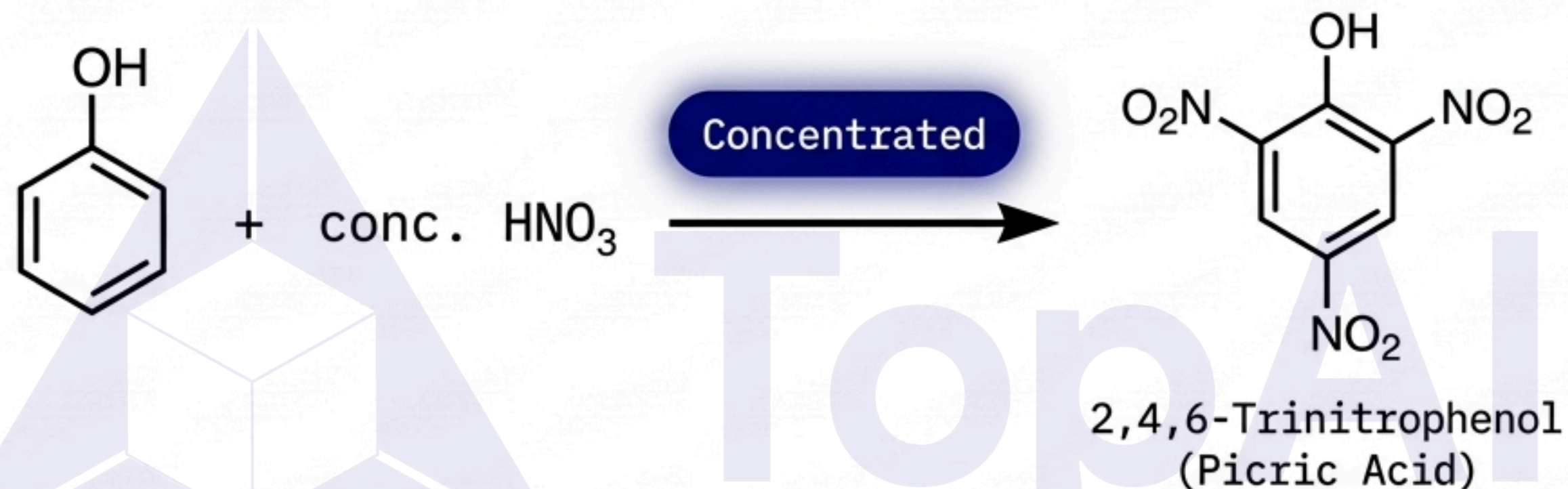
p-Nitrophenol



Intermolecular Association

Less Volatile (molecules stick together, harder to vaporize).

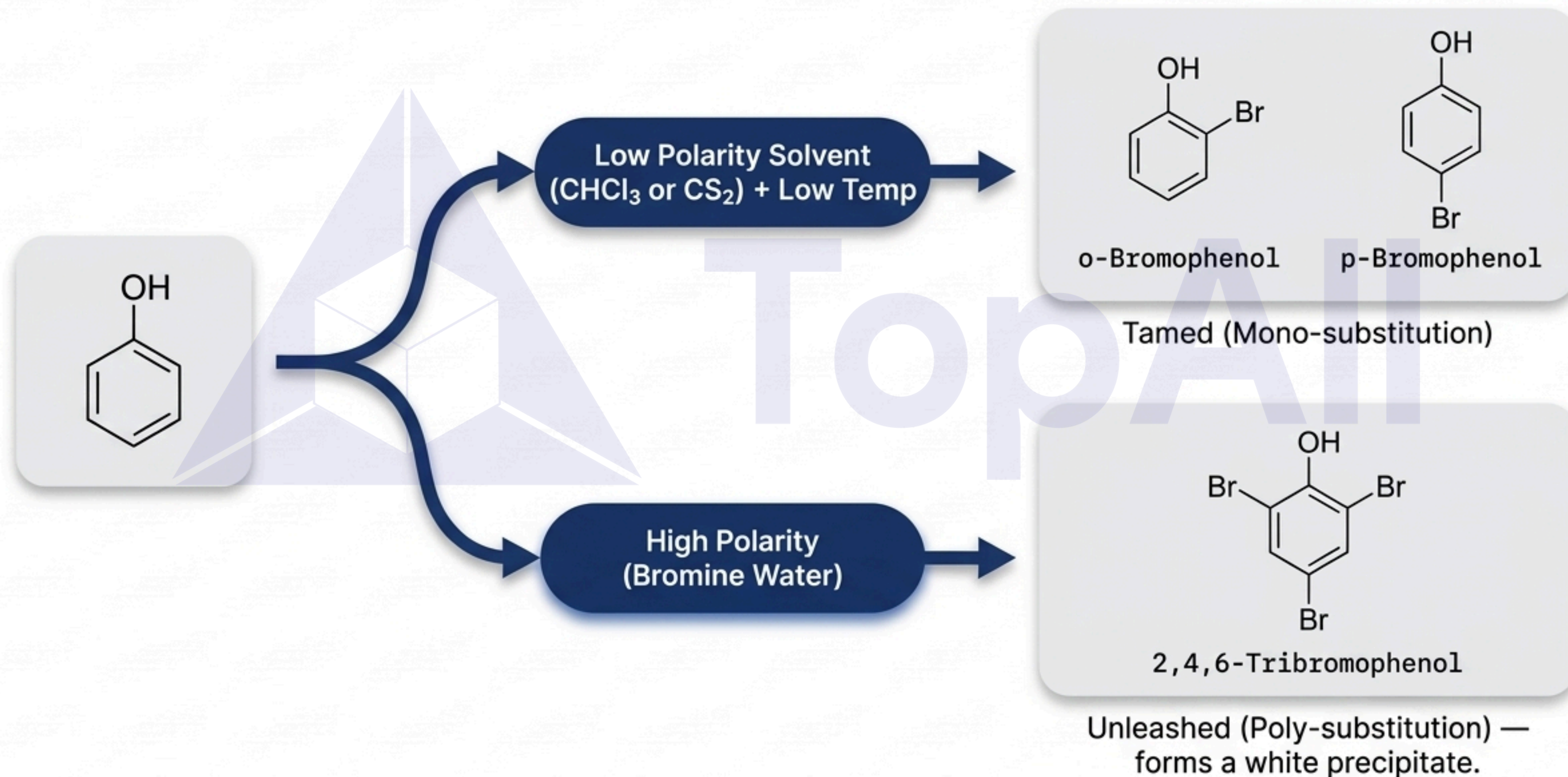
The Unleashed Reaction: Poly-Nitration



Direct synthesis with conc. HNO_3 gives a poor yield.



The Halogenation Fork: Polarity as a Switch



JEE Trap Alert: The Missing Catalyst



Watch for this: Phenol's halogenation does NOT require a Lewis acid catalyst (unlike plain benzene).

The -OH group is such a strong activating group that it polarises the halogen molecule entirely on its own.
No assistant needed.

Mastering the Control Board

- **Reaction Conditions are Switches.** Low polarity solvents or dilute reagents yield mono-substitution. High polarity solvents or concentrated reagents unleash poly-substitution.
- **Geometry Dictates Volatility.** Isomer separation hinges on H-bonding. Ortho isolates itself (intramolecular = volatile); Para links up with neighbors (intermolecular = less volatile).





You've Learned the Theory.

Now Let's Test It.

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