

UNIT 7 • ALCOHOLS, PHENOLS AND ETHERS

Esterification of Alcohols and Phenols

Mastering the equilibrium driving forces in acid-catalyzed and base-driven routes.

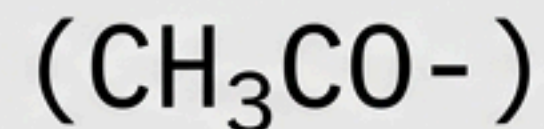
Esterification

The general reaction of an alcohol or phenol with a carboxylic acid (or its derivative) to form an ester.



Acetylation

A specific type of esterification involving the introduction of an acetyl group into an alcohol or phenol.





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$$E=mc^2$$



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Key Highlights

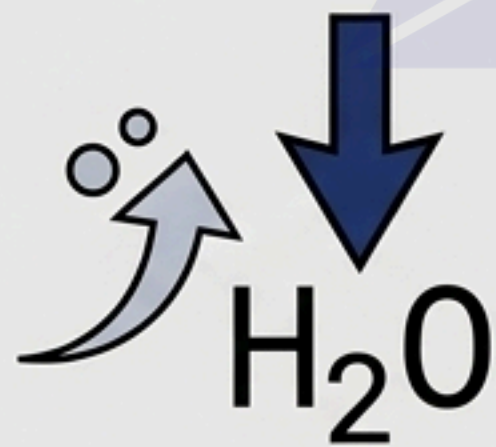
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Carboxylic Acid Route (with Acid Catalyst)



Catalyst:
Concentrated H_2SO_4



Water is physically removed as soon as it forms to shift equilibrium forward.

Acid Chloride Route (with Base)

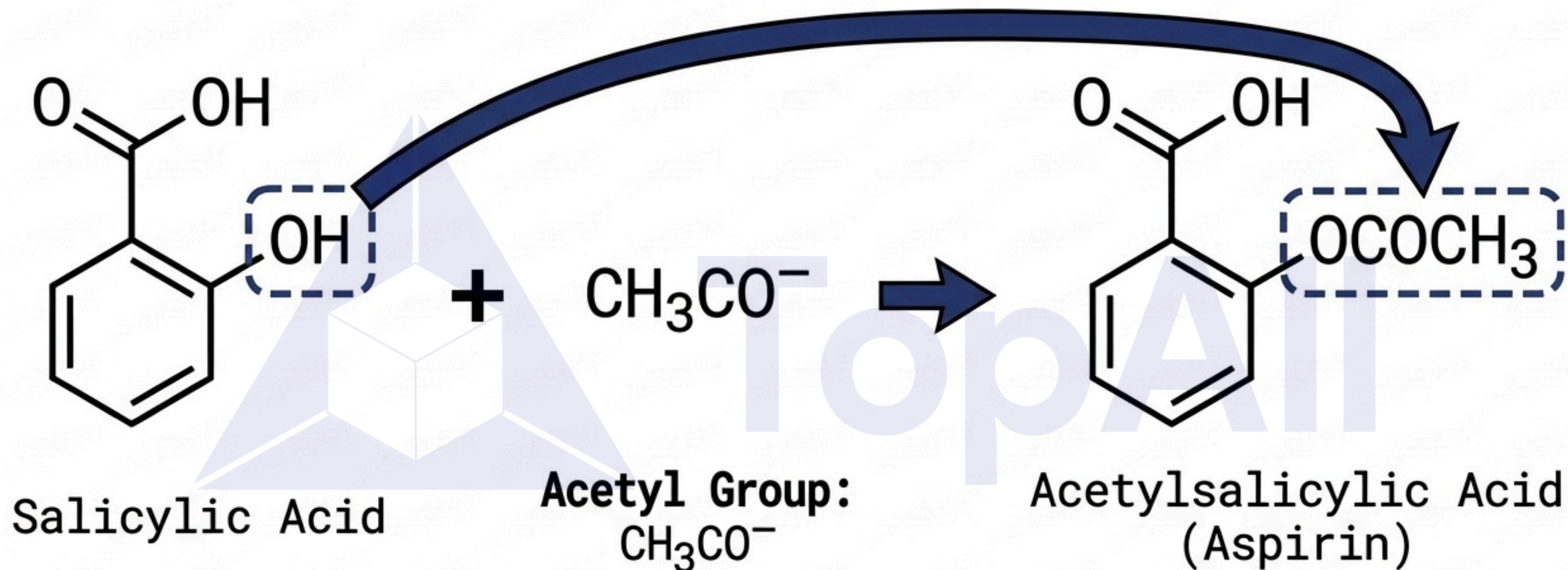


Reagent:
Pyridine



Pyridine chemically neutralizes the HCl by-product, actively forcing reaction to completion.

The Aspirin Spotlight



Aspirin is produced via the direct acetylation of salicylic acid. Notice how the acetyl group specifically targets the phenolic hydroxyl oxygen.

Watch for this: The Equilibrium Trap

The acid-catalyzed route is naturally reversible.



It **must** have continuous **water removal** to drive it forward.

The acid-chloride route produces HCl.



It **needs** pyridine specifically to neutralize the acid and shift the equilibrium.

MCQ Rule: Every esterification route needs its own specific “driving-force trick” to reach completion. **Never** ignore the reaction conditions.

Key Takeaways

- Esterification with carboxylic acids requires an acid catalyst and continuous water removal to overcome reversibility.
- Esterification with acid chlorides uses pyridine to neutralize HCl, while acetylation of salicylic acid yields aspirin.



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