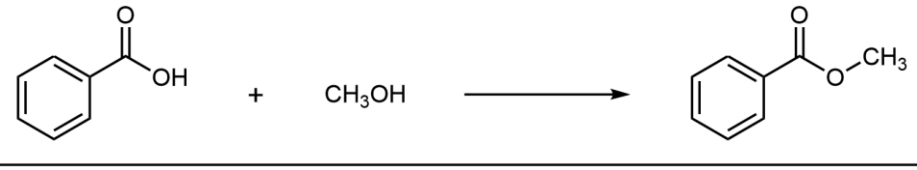
CONCEPT: INTRAMOLECULAR ACID/BASE CATALYSIS

- **Intramolecular Catalyst:** An acid/base or nucleophilic catalyst present within the reacting molecule.

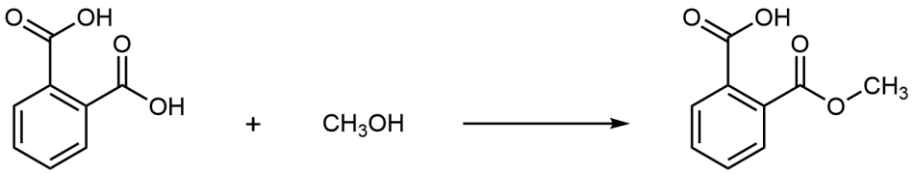
Intramolecular General Acid Catalysis

- Acidic groups can catalyze reactions by intramolecular _____.

Intramolecular General Acid Catalysis

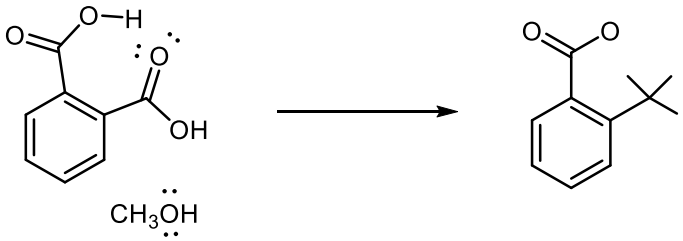


EXAMPLE: Write a plausible mechanism for the following esterification reaction.

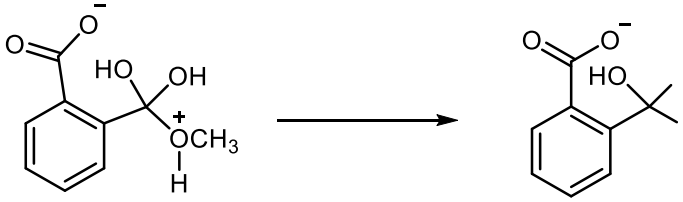


STEP 1: Protonation and Nucleophilic Attack: Carbonyl group is protonated through intramolecular protonation.

□ Methanol molecule attacks the protonated carbonyl group.

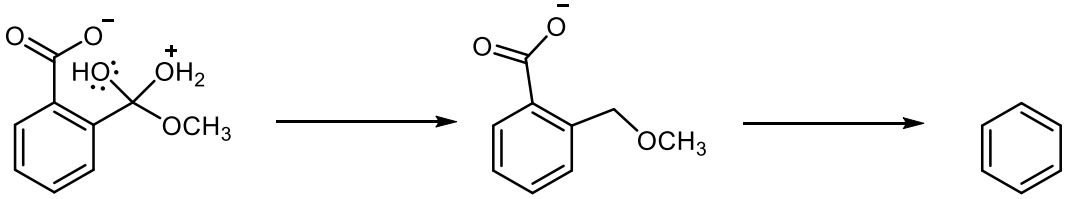


STEP 2: Proton Transfer: An H^+ is transferred from the _____oxy O to a _____oxy O.



STEP 3: Leaving Group and Proton Transfer: Carbonyl group is reformed, and _____ is kicked out.

□ Final product is formed after an intramolecular proton transfer.

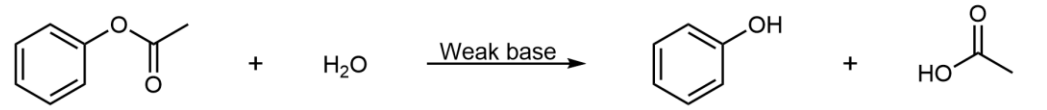
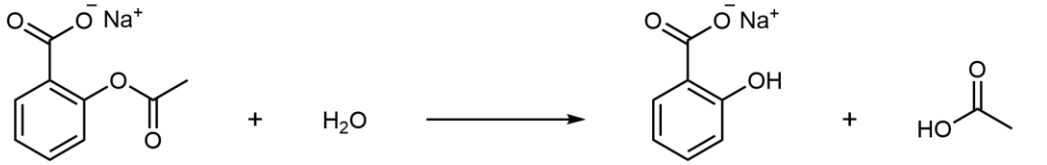


CONCEPT: INTRAMOLECULAR ACID/BASE CATALYSIS

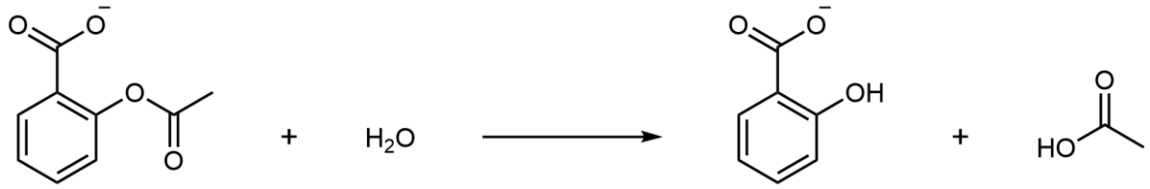
Intramolecular General Base Catalysis

● Basic groups can catalyze hydrolysis reactions by _____ of water.

Intramolecular General Base Catalysis

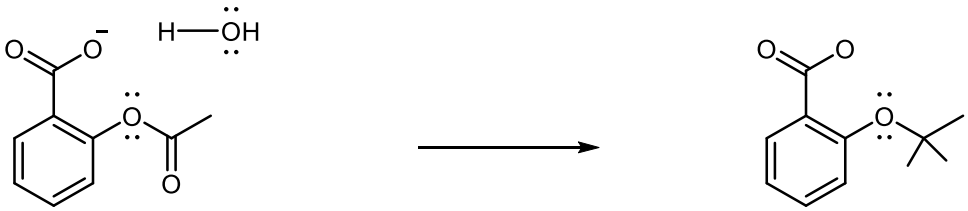
Reaction	Relative Rate
	_____
	_____
	_____

EXAMPLE: Write a plausible mechanism for the following hydrolysis reaction.



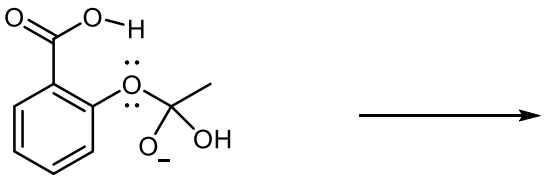
STEP 1: Deprotonation and Nucleophilic Attack: Carboxylate anion deprotonates H_2O to produce ____.

□ OH^- ion attacks the carbonyl group to form a tetrahedral intermediate.



STEP 2: Leaving Group and Intramolecular Proton Transfer: Alkoxy ___ kicks out the phenoxide ion.

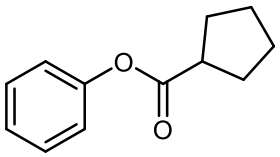
□ An intramolecular H^+ transfer takes place as the phenoxide is kicked out.



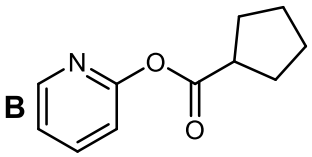
CONCEPT: INTRAMOLECULAR ACID/BASE CATALYSIS

PRACTICE: Which of the following compounds should undergo hydrolysis faster at neutral pH? Write mechanism for the hydrolysis of that compound.

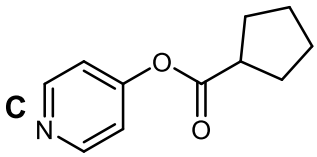
A



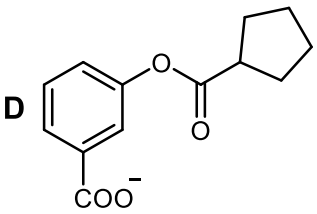
B



C



D



PRACTICE: The following compound, when heated in a solution, undergoes hydrolysis without an acid catalyst. Write a plausible mechanism for the hydrolysis reaction.