

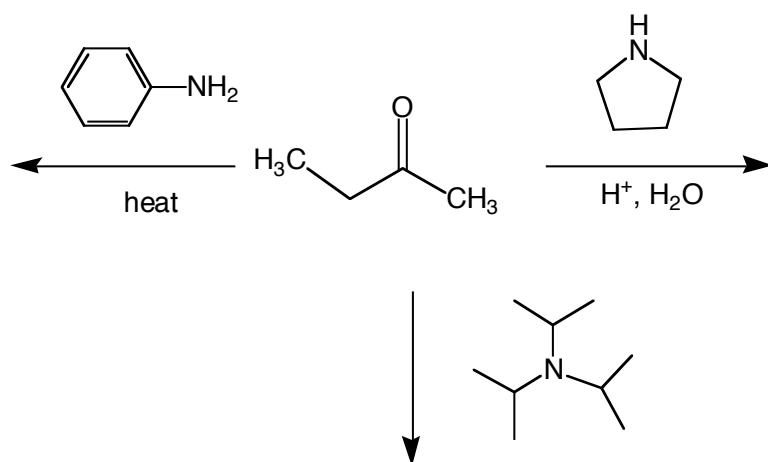
PRACTICE EXAM QUESTIONS: CARBONYL CHEMISTRY MODULE

Predict the reaction products for the following reactions. You should be able to write curly-arrow mechanisms for each reaction.

$\text{Ph}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H} + \text{Ph}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H} \xrightarrow[\text{H}_2\text{O}]{\text{NaOH (low concentration)}} \text{Ph}-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$	
$\text{Ph}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H} + \text{Ph}-\overset{\text{O}}{\parallel}{\text{C}}-\text{H} \xrightarrow[\text{H}_2\text{O}]{\text{H}_2\text{SO}_4} \text{Ph}-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{H}$	
$\text{Ph}-\overset{\text{O}}{\parallel}{\text{C}}-\text{OH} + \text{H}_2\text{C}^{\ominus}-\overset{\oplus}{\text{N}}\equiv\text{N} \longrightarrow$	
$\text{H}_3\text{C}-\overset{\text{O}}{\parallel}{\text{C}}-\text{OEt} \xrightarrow[2) \text{HCl}]{1) \text{NaOH}/\text{H}_2\text{O}}$	
$\text{EtO}-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{OEt} \xrightarrow[\text{EtOH}]{1) \text{NaOEt} \quad 2) \text{CH}_3\text{Br}}$	

The ketone shown below is subjected to reaction with the amines shown below.

- Which of the three reactions will give a product with an enamine?
- Draw the curved arrow mechanism that results in formation of a neutral tetrahedral intermediate species in the reaction to make an enamine.
- Why won't the other two amines form an enamine?
- What will be the outcome of the other two reactions?



Match the reactants on the right with the products on the left.

