GOAL:

- Perform an aldol condensation reaction with two unknown reagents
- Use ^{1}H NMR and melting point data to identify the product from a list of possible reagent reactions

KEY CONCEPTS:

- Prepare an aldol condensation product using an unknown aldehyde and an unknown ketone.
- Narrow down the possible aldehyde and ketone starting materials by analyzing the melting point of your condensation product. Identify the likely product of the condensation from melting range using potential products literature value melting ranges
    - Ex. Acetone + p-Tolualdehyde, Cyclohexanone + Cinnamaldehyde, etc.
- Finalize Identification via use of ^{1}H NMR of the obtained product.

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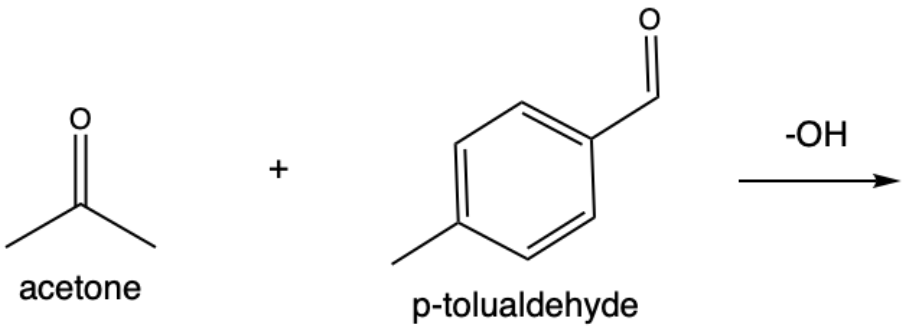
1. **Theory:** Draw the mechanism for the aldol condensation reaction between acetone and p-tolualdehyde.



2. Melting Point Data: You run an aldol condensation reaction using an unknown, aromatic aldehyde and unknown, non-aromatic ketone. The melting range of the reaction product will be used to determine which unknown aldehyde and ketone were utilized at the beginning of the experiment.

a. The experimental melting range obtained from your reaction is 135.5℃ - 156℃. Given the possible melting points of aldol condensation products in the table below, which aldehyde and ketone combinations were most likely used at the beginning of your experiment?

b. What do you do now to narrow down which aldehyde and ketone combination was used as starting material?

Melting Points of the Possible Aldol Condensation Products

Aldehydes	Ketones			
	Acetone	**Cyclopentanone**	**Cyclohexanone**	**4-Methylcyclohexanone**
***p*-Tolualdehyde**	175 °C	235 °C	170 °C	134 °C
***p*-Anisaldehyde**	130 °C	212 °C	159 °C	141 °C
Cinnamaldehyde	144 °C	225 °C	180 °C	163 °C