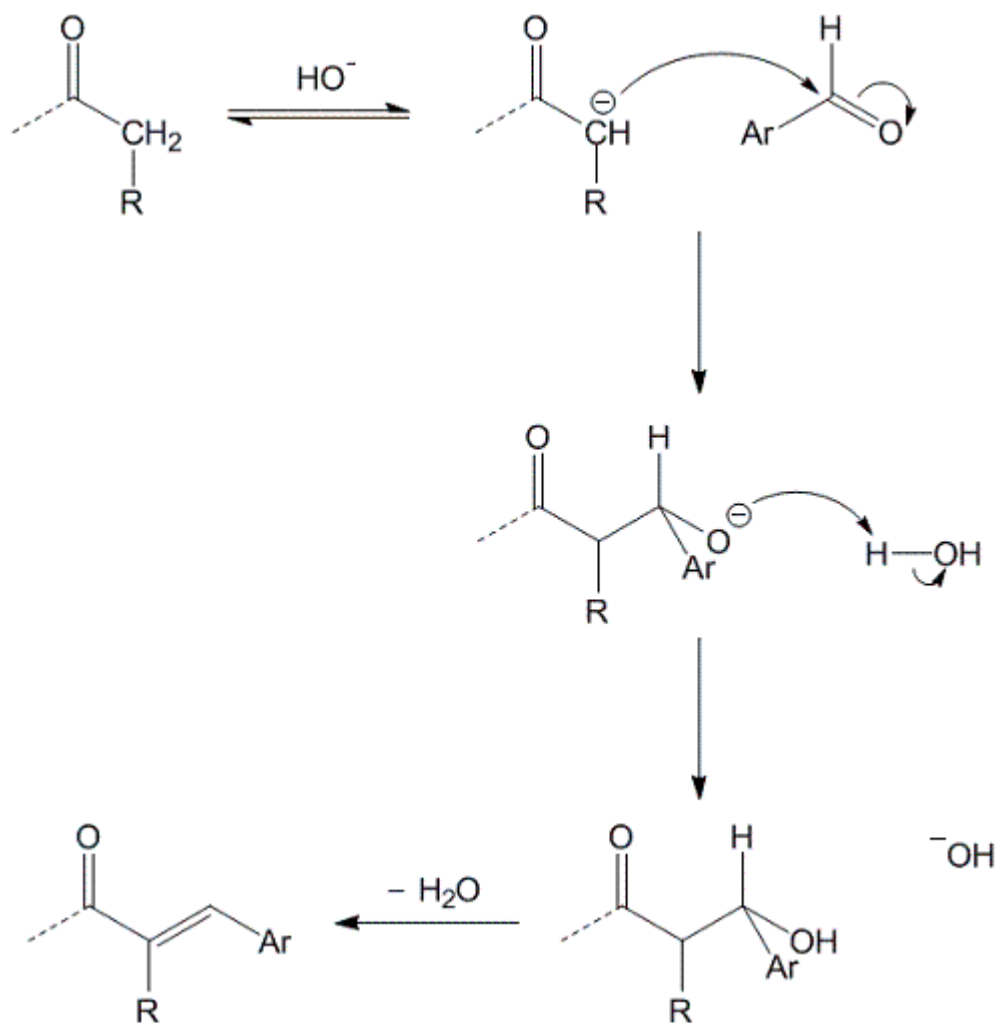


# An Aldol Condensation

by Trevor Rook, Peter McKay

## Experiment Overview

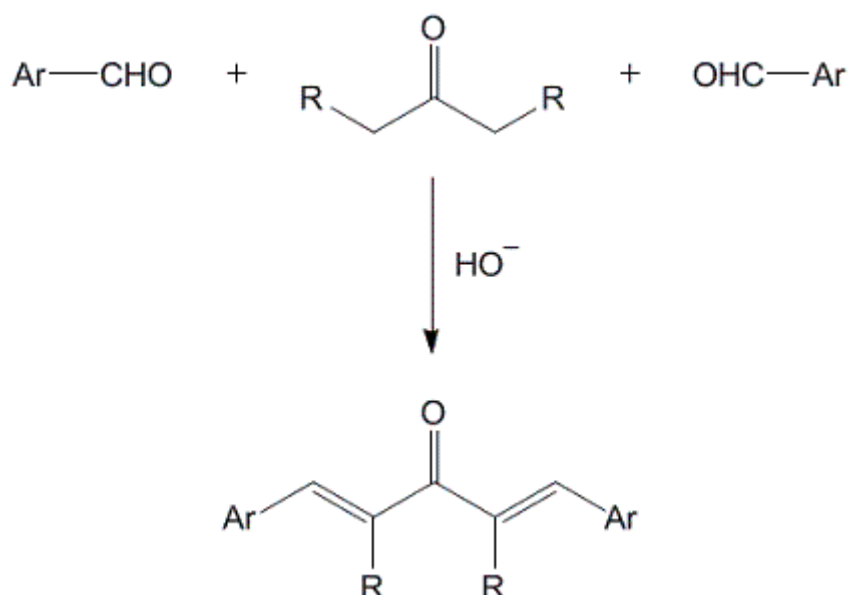
In this reaction a base-catalysed crossed aldol condensation will be performed, in which an enolate anion from a ketone adds to an aromatic aldehyde. It is followed by a virtually spontaneous dehydration:



Aldol reactions with two carbonyl compounds usually give mixtures of products: both reactants might form enolate anions, and each anion could react with either carbonyl compound – hence, four possible products. In this case, however,

- the aromatic aldehydes have no alpha hydrogen, so cannot form enolate anions; hence the anion must derive from the ketone;
- aldehydes react with nucleophiles faster than do ketones; hence the ketone enolate anion will preferentially react with the aromatic aldehyde.

In this practical **two** moles of aldehyde will be reacted per mole of ketone (this gives products that crystallise well):



## Level of Experiment

Second year undergraduate

## Keyword Descriptions of the Experiment

### Domain

organic chemistry

### Specific Descriptors

organic synthesis, aldol condensation

## Course Context

This experiment supports the teaching of the theory of carbonyl condensation reactions. It is also used to reinforce prior learning of recrystallisation, and to introduce the use of infra-red and organic UV/visible spectroscopy as techniques for organic analysis and structure confirmation.

## Prerequisite Knowledge and Skills

Students should be familiar with the theory of carbonyl condensation reactions, and should have prior experience of recrystallisation.

## Time Required to Complete

**Prior to Lab:** 30 min

**In Laboratory:** 6 h (including instrumental parts)

**After Laboratory:** 1.5 h

## Experiment History

This experiment has a long history in the School of Applied Science (formerly the Department of Chemistry) at RMIT University. The authors of the educational analysis are unaware of its original source.

## References

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