Crossed aldol reaction is a variation of aldol reaction.

**aldol reaction:**

\[
\text{enolizable aldehyde/ketone} + \text{H}_2\text{O} \xrightleftharpoons{\text{Catalyst: } \text{OH}} \text{aldol} \\
\text{low temperature}
\]

**crossed aldol reaction:**

\[
\text{enolizable aldehyde/ketone} + \text{H}_2\text{O} \xrightleftharpoons{\text{Catalyst: } \text{OH}} \text{alkol} \\
\text{low temperature}
\]

**eg:**

\[
\text{CH}_2\text{CHO} + \text{HCHO} \xrightarrow{\text{Catalyst: Ni(OH)}} \text{OH} \\
\text{H}_2\text{O} \xrightarrow{\text{low temperature}} \text{HCH}_2\text{CHO}
\]

**Mechanism:**

**Step 1:** The hydroxide ion deprotonates the enolizable aldehyde reversibly.

**Step 2:** Enolate ion 1 preferentially adds to the non-enolizable aldehyde, which has the sterically less hindered and, therefore, more accessible carbonyl carbon.

**Step 3:** Alkoxide ion 2 is protonated by water.

see also crossed aldol condensation

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**Contributors**

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