Fischer esterification is the esterification of a Carboxylic acid by heating it with an alcohol in the presence of a strong acid as the catalyst.

\[
\begin{align*}
R'\text{CO}_2\text{H} + \text{HO-R} & \xrightarrow{\text{H}_2\text{SO}_4} R'\text{CO}_2\text{R} + \text{H}_2\text{O} \\
\end{align*}
\]

Going from reactants to products simplified

Example

Mechanism

The overall reaction is reversible; to drive the reaction to completion, it is necessary to exploit Le Châteliers principle, which can be done either by continuously removing the water formed from the system or by using a large excess of the alcohol.

1) Protonation of the carbonyl by the acid. The carbonyl is now activated toward nucleophilic attack.

\[
\begin{align*}
\text{C}=\text{O} & \xrightarrow{\text{H}^+} \text{C}(\text{H})\text{O}^+ \\
\end{align*}
\]

2) Nucleophilic attack on the carbonyl

\[
\begin{align*}
\text{C}(\text{H})\text{O}^+ & \xrightarrow{\text{B}^-} \text{C}(\text{H})\text{O}^- + \text{B}^\ominus \\
\end{align*}
\]

3) Proton transfer
4) Water leaves

5) Deprotonation

Contributors

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