Carboxylic acids react with Thionyl Chloride ($\text{SOCl}_2$) to form acid chlorides. During the reaction the hydroxyl group of the carboxylic acid is converted to a chlorosulfite intermediate making it a better leaving group. The chloride anion produced during the reaction acts as a nucleophile.

**General Reaction**

\[
\begin{align*}
\text{R-COOH} & \quad \overset{\text{SOCl}_2}{\longrightarrow} \quad \text{RCOCl} + \text{HCl} + \text{SO}_2 \\
\end{align*}
\]

**Example**

**Mechanism**

1) Nucleophilic attack on Thionyl Chloride

2) Removal of Cl leaving group

A Chlorosulfite

3) Nucleophilic attack on the carbonyl

4) Leaving group removal
5) Deprotonation

Contributors

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Further Reading

Master Organic Chemistry

Thionyl Chloride

Khan Academy

Acid Chloride Formation

Chemtube3D

Acid Chloride formation