Summary of Reactions of Carboxylic Acids:

1) Reaction with water:

O O
$$\parallel$$
 $R - C - OH + H_2O \rightleftharpoons R - C - O^- + H_3O^+$

2) Neutralization (reaction with OH⁻):

O
$$\parallel$$
 $R-C-OH + NaOH (aq)$ \rightleftarrows $R-C-O^-Na^+(aq) + H_2O$

3) Esterification (reaction with alcohol):

This –OH group is replaced by this –OR' group.

$$\begin{array}{c}
O\\
R-C-OH\\
A carboxylic\\
acid
\end{array}$$

This –OH group is replaced by this –OR' group.

$$\begin{array}{c}
O\\
H^+ \text{ catalyst}\\
R-C-OR'\\
An ester
\end{array}$$

An ester

4) Decarboxylation:

$$\begin{array}{cccc}
\mathbf{O} & & & \\
\parallel & & & \\
\mathbf{R} - \mathbf{C} - \mathbf{O} - \mathbf{H} & \rightleftharpoons & \mathbf{R} - \mathbf{H} + \mathbf{CO}_{2}
\end{array}$$