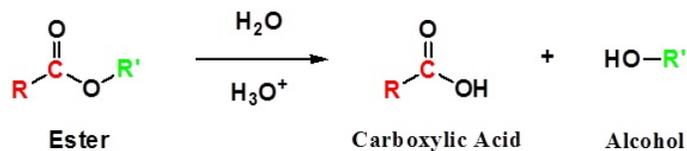


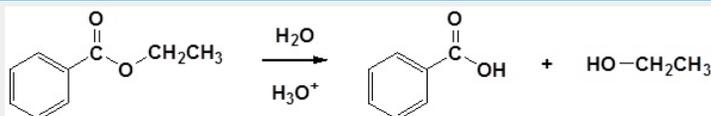
20.2: Reactions of Esters

Esters can be cleaved back into a carboxylic acid and an alcohol by reaction with water and a catalytic amount of acid.

General Reaction

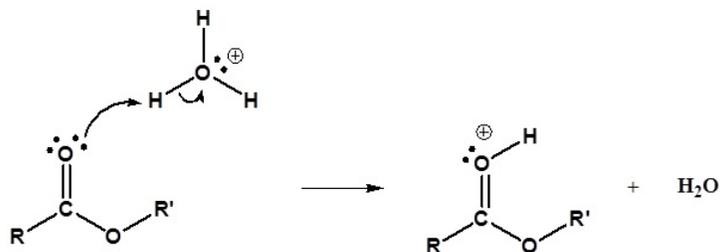


Example 1:

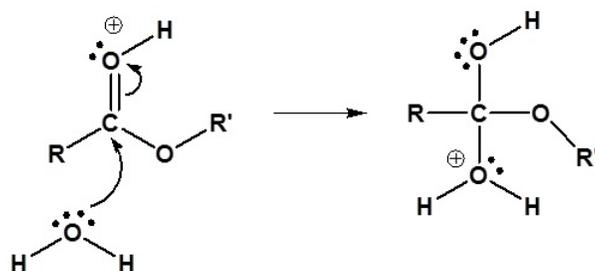


Mechanism

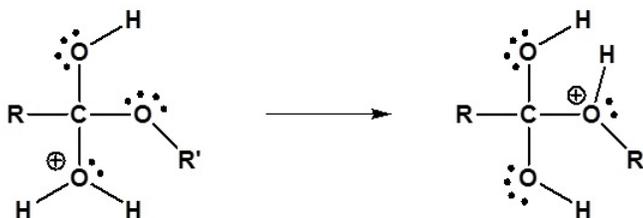
1) Protonation of the Carbonyl



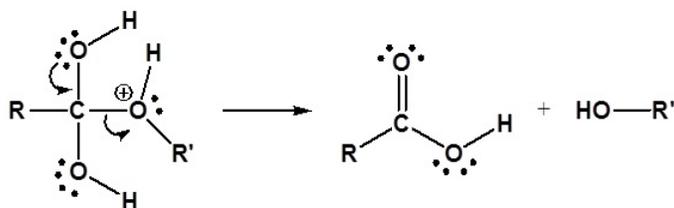
2) Nucleophilic attack by water



3) Proton transfer



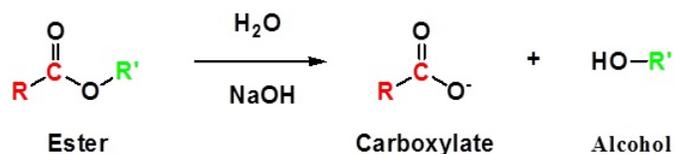
4) Leaving group removal



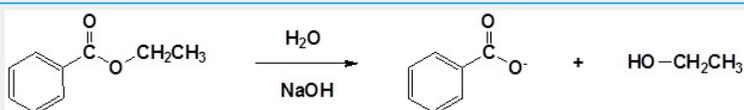
Esters can be cleaved back into a carboxylic acid and an alcohol by reaction with water and a base

The reaction is called a saponification from the Latin *sapo* which means soap. The name comes from the fact that soap used to be made by the ester hydrolysis of fats. Due to the basic conditions a carboxylate ion is made rather than a [carboxylic acid](#).

General reaction

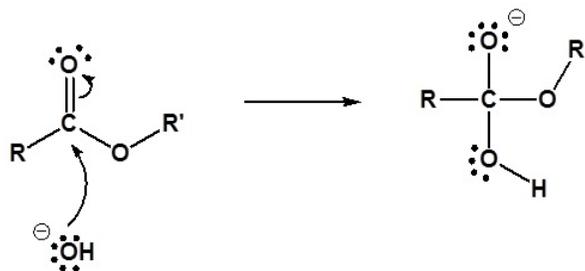


Example 1:

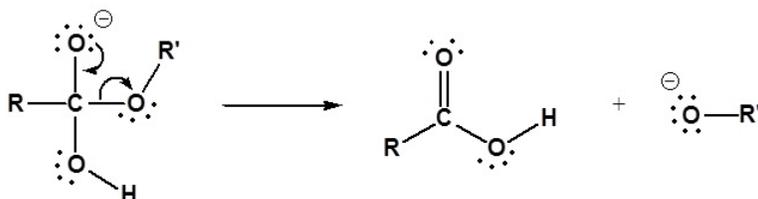


Mechanism

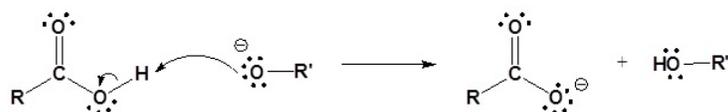
1) Nucleophilic attack by hydroxide



2) Leaving group removal



3) Deprotonation



Contributors

- Prof. Steven Farmer ([Sonoma State University](#))

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