

6. Reactions of Esters:

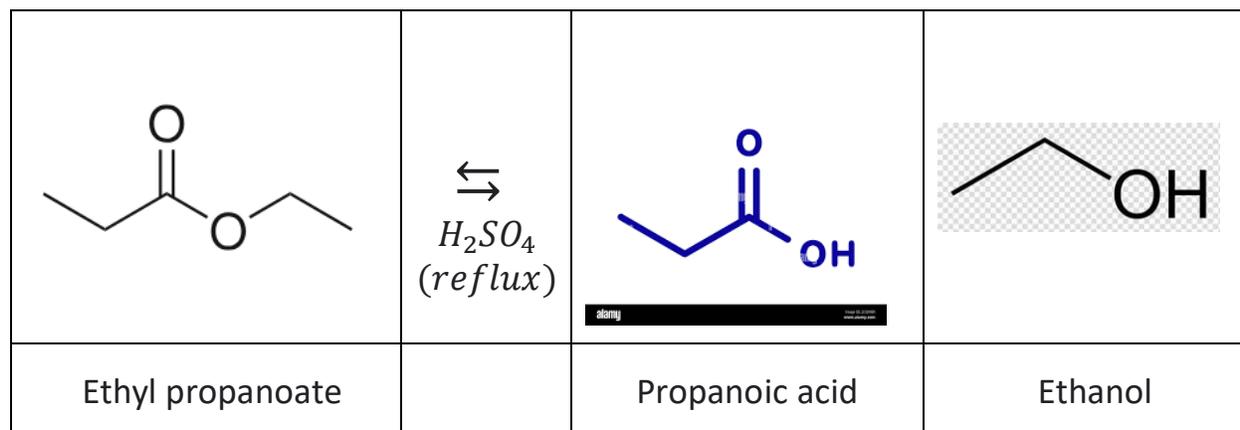
The most common reaction of esters is cleavage reaction. It is an acid or base catalyzed-hydrolysis reaction. Carboxylic acid and alcohol are the products.

Cleavage reaction also may happen thermally (thermal decomposition) where carboxylic acid and alkene are the products.

Acid and base-catalyzed hydrolysis reactions of ethyl propanoate are shown below:

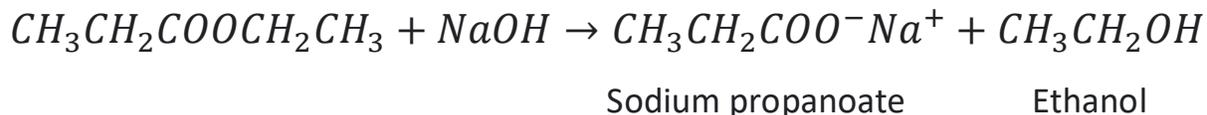
➤ Acid-catalyzed hydrolysis:

Ethyl propanoate reacts with water/ H_2SO_4 /heat (reflux) to give propanoic acid and ethanol. The reaction does not go to completion. It is reversible. An equilibrium (reversible) is reached between the reactants and products. The products are increased by adding more water.



➤ Base-catalyzed hydrolysis (Saponification):

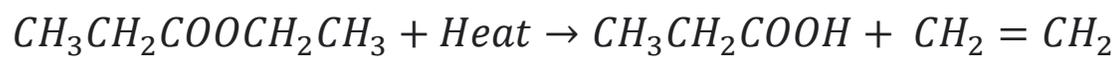
This reaction uses a strong base (e.g., NaOH) and is typically faster and irreversible because in basic medium the carboxylic acid product is converted into a non-reactive carboxylate salt (sodium propanoate).



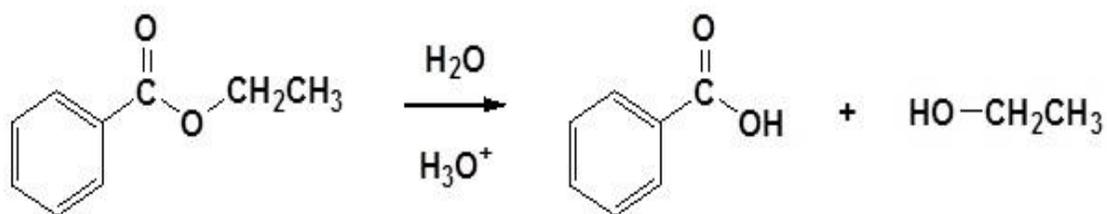
Acidification of sodium acetate gives the propanoic acid:



Thermal decomposition of propyl acetate produces propanoic acid and ethylene.



One more example:



The End