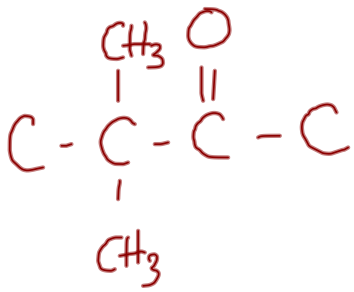
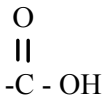
Aldehydes and Ketones Sheet

f) 

Carboxylic Acids

Carboxylic Acid - contain a carbonyl and a hydroxyl functional group together (**carboxyl group**)

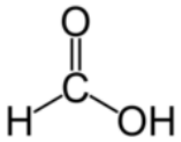


or - COOH ← **this is how it is often written**

- small carboxylic acids mix with water but large carboxylic acids do
- give a positive litmus test (blue to red).

Naming
- carboxylic acids are named by replacing the "e" in the alkane name by oic and adding acid.
- compounds with more than one carboxyl group are usually identified with a common name.

Ex.



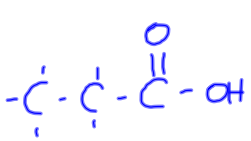
methanoic acid

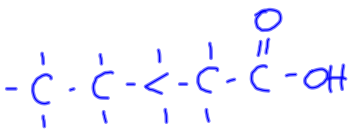
SAMPLE PROBLEM - Name the following:

(a) $CH_3 - C(=O) - OH$ (b) $CH_3CH_2CH_2 - C(=O) - OH$

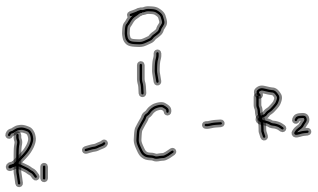
ethanoic acid. butanoic acid

(c) propanoic acid (d) pentanoic acid





Alcohol $R-OH$

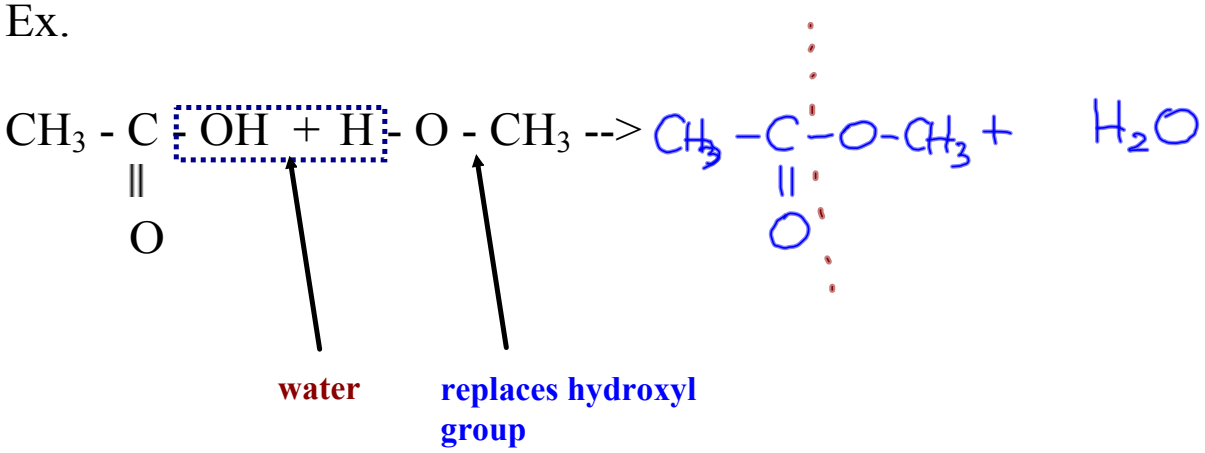


Reactions

Condensation Reaction:
a carboxylic acid combines with another compound to produce an organic compound and a second product (such as water)

A condensation reaction between a carboxylic acid and an alcohol is called esterification.
(formation of an ester and water)

Ex.

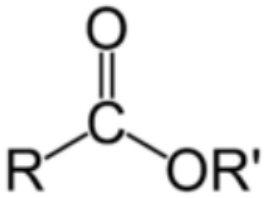


Uses of Carboxylic Acids

Carboxylic acids are found in foods (vinegar), sting/poison treatment, and are used in the preparation of many other chemicals.

Esters

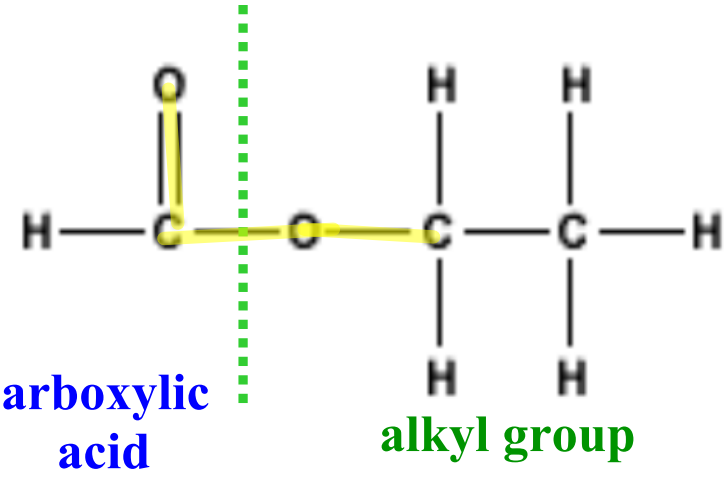
General Formula for ester:



-the functional group is similar to the carboxylic acid functional group but with the H of the carboxyl group replaced with a hydrocarbon branch (R)

Naming esters - two parts

I. name the alkyl group in the alcohol used in the esterification.
II. name of the acid but change the " oic acid " to oate.



ethyl methanoate

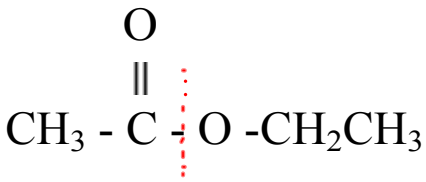
Uses of Esters

Esters are often used as adhesives, perfumes, flavourings and painkillers.

Esters

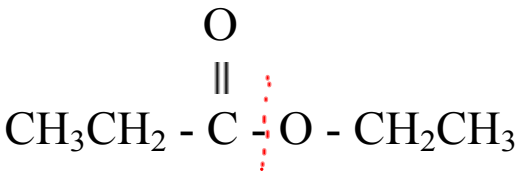
Name the following

(a)



ethyl ethanoate

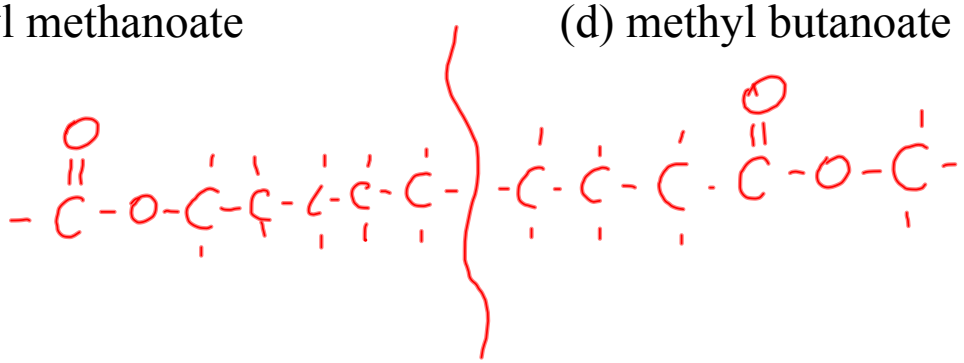
(b)



ethyl propanoate

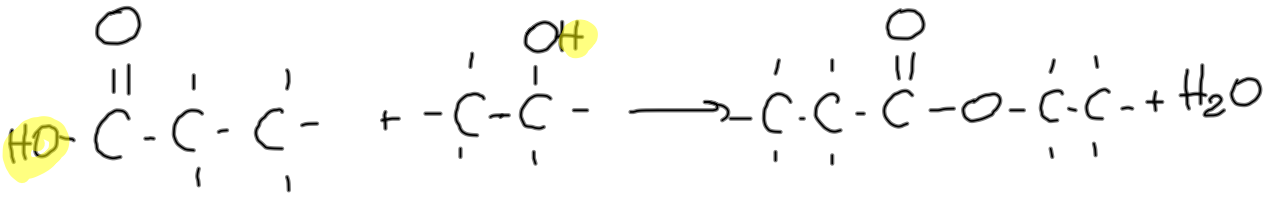
Draw condensed structural diagrams for the following.

(c) pentyl methanoate



(d) methyl butanoate

propanoic acid + ethanol ⟶ ethyl propanoate + water



Homework

Worksheet