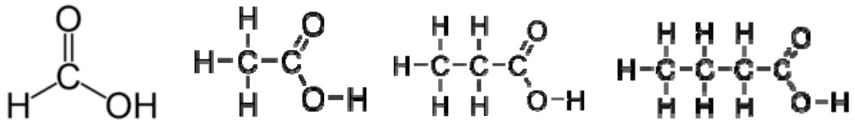
CHAPTER 4
CARBOXYLIC ACIDS

4.1 NAMING CARBOXYLIC ACIDS AND CARBOXYLATE IONS

To generate the systematic name of carboxylic acids, drop the -e of the corresponding alkane and add -oic acid. The older common names must simply be memorized. You should know the common as well as systematic names for the carboxylic acids containing up to 4 C atoms.



Systematic:	methanoic acid	ethanoic acid	propanoic acid	butanoic acid
Common:	formic acid	acetic acid	propionic acid	butyric acid

To name the carboxylate ions take the name of the acid, drop "ic" and add "ate".

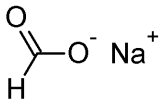
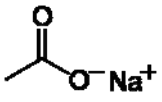
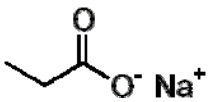
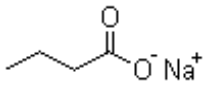
Ions:

Systematic:	methanoate ion	ethanoate ion	propanoate ion	butanoate ion
Common:	formate ion	acetate ion	propionate ion	butyrate ion

Even when no positive ion is explicitly shown next to the negatively charged carboxylate ion, there must be a positive ion to balance the negative charge, even if it is not shown.

When the positive ion is shown, it is normally placed adjacent to the negatively charged O- of the carboxylate ion. There is an **ionic** bond between the negatively charged O atom of the carboxylate ion and the positively charged ion.

In the examples shown below the positive ion is a Na^+ ion.

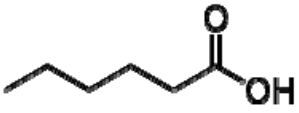
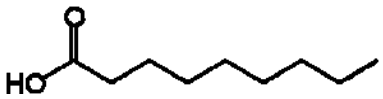
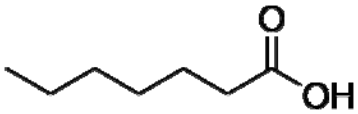





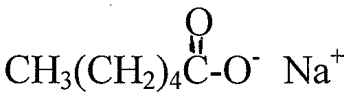
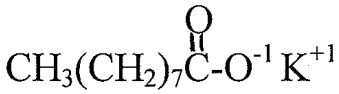
Systematic: sodium methanoate sodium ethanoate sodium propanoate sodium butanoate

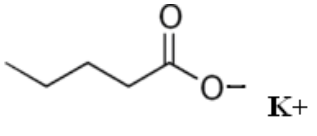
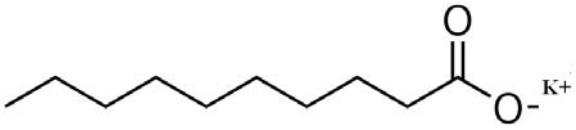
Common: sodium formate sodium acetate sodium propionate sodium butyrate

The positive ion name goes first just like in inorganic compounds (e.g. sodium chloride, potassium fluoride) even if the positive ion is shown at the right of the carboxylate, as it is in the above structures.

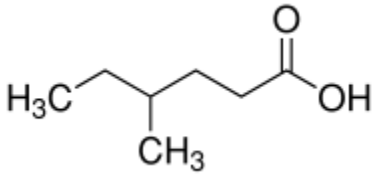
Name the following:

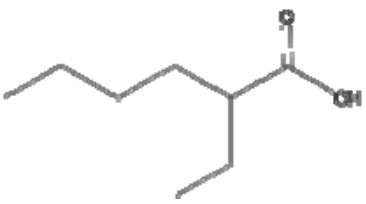



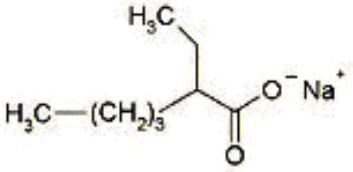



Numbering of C chains with carboxylic acid functional groups starts from the carboxylic acid end of the molecule, even if that assigns larger numbers to other alkyl groups. Examples:



is 4-methyl hexanoic acid (and the carboxylic acid is understood to be on C#1, without explicitly numbering it.)
It is **not** named 3-methyl-6-hexanoic acid.
Likewise the structures below are 2-ethylhexanoic acid and sodium 2-ethyl hexanoate.


O
OH


H3C
O⁻ Na⁺
H3C—(CH2)3
O