

Chapter: Other Organic Compounds

Section 2: More Classes of Organic Compounds



Aldehydes: organic compounds in which the carbonyl group is attached to a carbon atom at the end of a carbon-atom chain

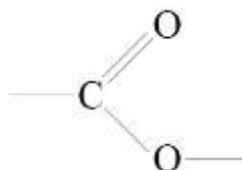
- Nomenclature
 - Name the parent compound
 - Locate the longest continuous chain that contains the carbonyl group
 - Change the *-e* to *-al*

Ketone: organic compounds in which the carbonyl group is attached to carbon atoms within the chain

- Nomenclature
 - Name the parent compound
 - Longest continuous chain that contains the carbonyl group
 - Change the *-e* to *-one*
 - Number the carbon atoms in the parent chain
 - Number so the carbonyl group has the lowest number
 - Position numbers and punctuate the name

Properties and Uses of Aldehydes and Ketones:

- Simplest aldehyde is methanal, called formaldehyde, commonly used in biology labs as a preservative for dead animals and now used in the production of plastics
- Simplest ketone is 2-propanone, called acetone, found in nail-polish removers
- Responsible for odors and flavors



Carboxyl group:

Carboxylic acids: organic compounds that contain the carboxyl functional group

- Nomenclature:
 - Name the parent compound
 - Longest continuous chain that contains the carboxyl group
 - Only one
 - Change *-e* to *-oic acid*
 - Two
 - Change *-e* to *-dioic acid* for 2

Properties and uses of carboxylic acids:

- React to lose the hydrogen ion
- Acetic acid, weak acid in vinegar, is called ethanoic acid
- Occur naturally in plants and animals
 - Citrus fruits contain citrus acid
- Used as preservatives
- Methanoic and ethanoic acid widely used
 - Used to make PVA – used in latex paint and adhesives

Esters: organic compounds with carboxylic acid groups in which the hydrogen of the hydroxyl group has been replaced by an alkyl group

- Nomenclature:
 - Name the parent change
 - longest continuous chain that contains the carboxyl group
 - change the ending to *-oate*
 - Add the name of the alkyl group
 - Identify the alkyl group and add it to the front of the name
 - Leave spaces in the name

Properties and Uses of Esters:

- Common in plants

- Distinctive flavors and odors
 - Scientists were able to synthesize the natural flavors to make artificial flavors (banana flavor)

Amines: organic compounds that can be considered to be derivatives of ammonia, NH_3

- Nomenclature:
 - Name the parent compound
 - The end of the name is *-amine*
 - Add the names of the alkyl groups
 - Arrange the names in alphabetical order
 - Add prefixes *di-* and *tri-*
 - Add the names in front to form one word

Primary amine: one hydrogen atom of an ammonia molecule has been replaced by an alkyl group

Secondary amine: two hydrogen atoms of an ammonia molecule have been replaced by alkyl groups

Tertiary amine: all three hydrogen atoms of an ammonia molecule have been replaced by alkyl groups

Properties and Uses of Amines:

- Found as toxin in some animals
- Formed during the breakdown of proteins in animal cells
 - Foul odors in decaying bodies
 - Methylamine...found in dead fish
- Alkaloids: class of organic compounds that contain amines
 - Naturally occurring amine products of plants that have physiological effects on animals
 - Caffeine, nicotine, and morphine
 - Complex structures