

Chemistry 2.5

Organic Chemistry

Introduction to Organic Chemistry

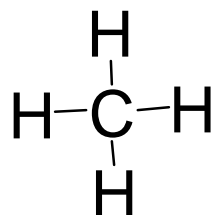
Alkane

Organic Chemistry

- Organic Chemistry is the study of carbon base covalent compounds.
- Organic chemicals are the building blocks of all living organism on earth.
- A organic compound usually consists of three parts
 - Main chain
 - Side chain(s)
 - Functional group(s)
 - This determines the chemistry of the compound

Hydrocarbons

- Hydrocarbons are organic compounds made out of carbon and hydrogen only
- There are three types of hydrocarbons
 - Alkanes – contain C-C single bond only
 - Alkenes – contain at least one C=C double bond
 - Alkyne – contain at least one C≡C triple bond



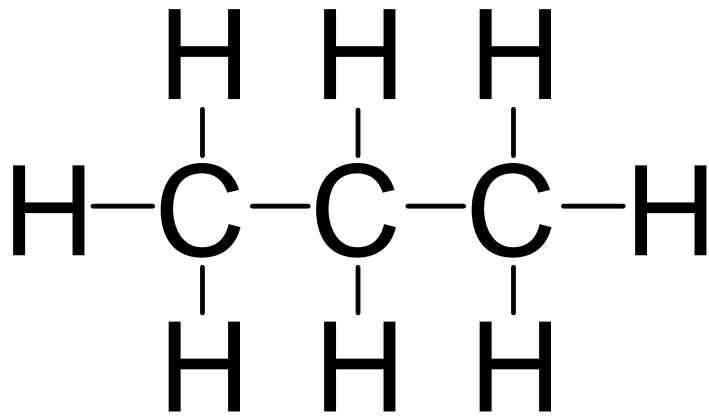
Methane is an alkane and it is the simplest organic substance

Simple Alkane

- The “backbone” of any organic compounds consist of a hydrocarbon chain.
- The length of this chain (number of carbons) is expressed by a prefix
- All naming of alkane ends with the suffix “ane”

# of C	1	2	3	4	5	6	7	8
Prefix	Meth	Eth	Prop	But	Pent	Hex	Hept	Oct

Example



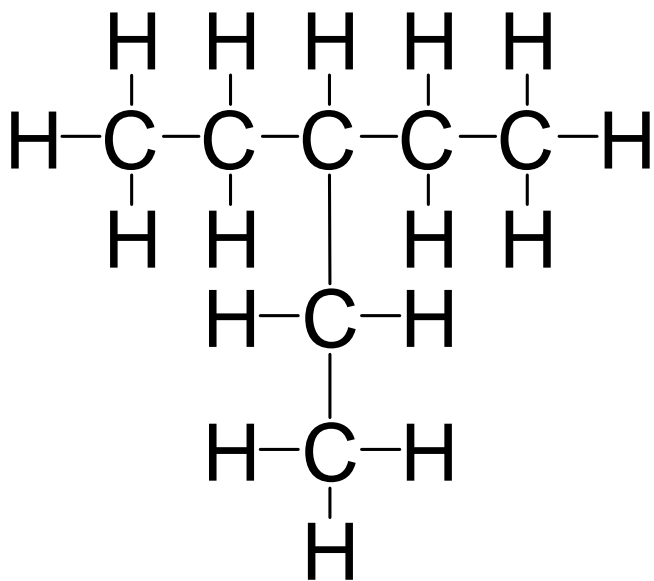
- Hydrocarbon
- All single bonded
- Alkane
 - Suffix “ane”
- Contains 3 carbons
 - Prefix “Prop”
- Name is...

propane

Branched Chain Alkanes

- **Branched chains** also known as **side chains**
- It is named **in front** of the prefix of the main chain (The LONGEST chain)
- The prefixes of side chains are the same as the main chains and it ends with “**yl**”.
- A number is put in front to indicate the location of the side chain.
- Between number and alphabet a dash “-” is used

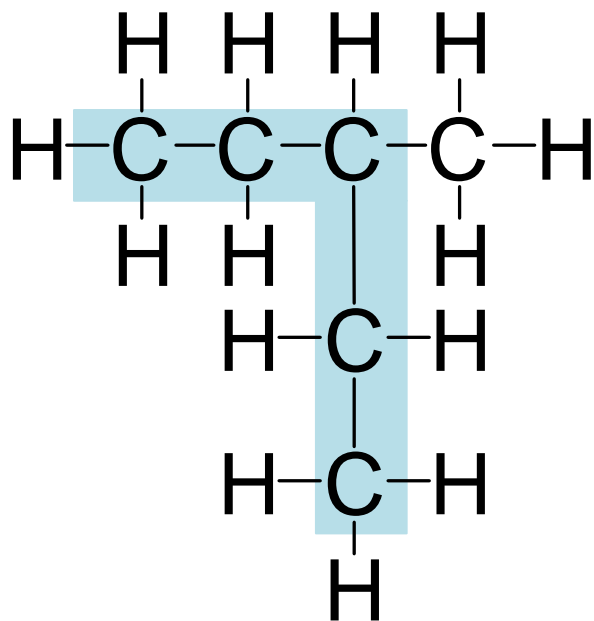
Example 1



- Hydrocarbon
- All single bonded
 - Alkane
 - Suffix “ane”
- Main chain contains 5 carbons
 - pentane
- Side chain contains 2 carbons
 - ethyl pentane
- Side chain located on the 3rd carbon

3-ethyl pentane

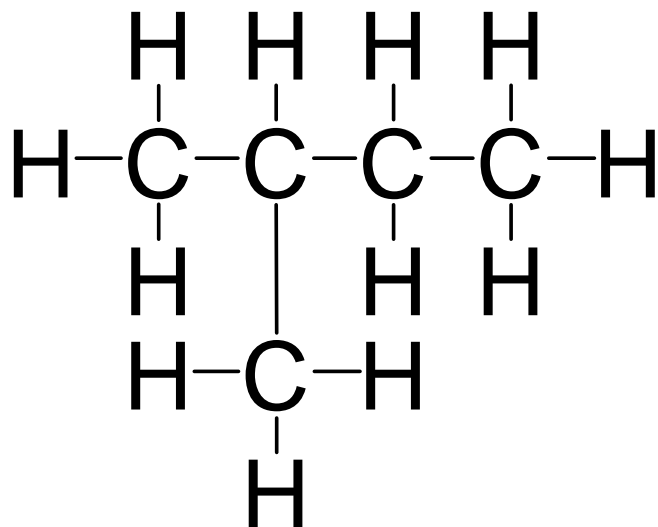
Example 2



- Hydrocarbon
- All single bonded
 - Alkane
 - Suffix “ane”
- Main chain contains 5 carbons
 - pentane
- Side chain contains 1 carbons
 - methyl pentane
- Side chain located on the 3rd carbon

3-methyl pentane

Example 3



- Hydrocarbon
- All single bonded
 - Alkane
 - Suffix “ane”
- Main chain contains 4 carbons
 - butane
- Side chain contains 1 carbons
 - methyl butane
- Side chain located on carbon number 2 or 3, and the smallest number is used.

2-methyl butane

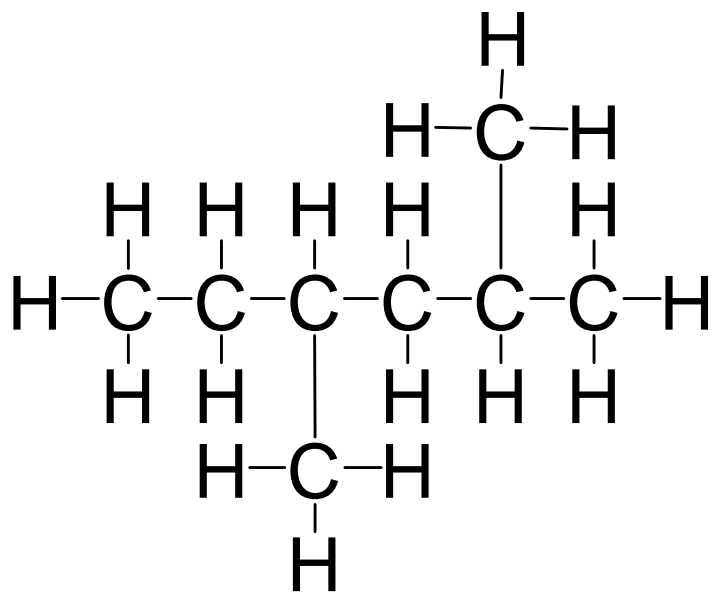
More Side Chains

- Each location is listed in number and between number, a “,” is used
- Depend the number of the same side chain, a prefix is used in front of the prefix

# of side chains	2	3	4
Prefix	di	tri	tetra

- Example
 - 1,2,2-trimethyl

Example



- Hydrocarbon
- All single bonded
 - Alkane
 - Suffix “ane”
- Main chain contains 6 carbons
 - hexane
- 2 Side chains contains 1 carbons
 - dimethyl butane
- Side chain located on carbon number 2 and 4 or 3 and 5, and the smallest total number is used.

2,4-dimethyl hexane