Name: Key

Chapter 17: Alkanes

Alkanes

Compounds in food contain organic compounds

IUPAC Names:

Examples:

1	meth	6	hex
2	eth	7	hept
3	prop	8	oct
4	but	9	non
5	pent	10	dec

Structural Formulas

Alkanes are written in structural formulas that are:

- expanded to show each bond
- condensed to show each carbon atom and the attached hydrogen atoms

Drawing Structural Formulas

Carbon atoms in a chain:

- -maintain their tetrahedral shape
- -are connected in a zigzag pattern
- -are drawn as two-dimensional
- -can be written in many ways

Some Structural Formulas

Rotation of the end CH_3- groups provides different representations for butane

Structural formula for heptane:

$$CH_3-CH_2-CH_2-CH_2-CH_2-CH_2-CH_3$$

Name each of the following:

A. $CH_3–CH_2–CH_2–CH_3$ 4 carbons = butane

B. $CH_3–CH_2–CH_2–CH_2–CH_2–CH_2–CH_2–CH_3$ eight carbons = octane

Isomers of Butane

Isomers:

-have the same molecular formula

- have different atomic arrangements

-for butane are straight chain and a branched chain

Substituents

In the IUPAC system:

-a carbon branch is named as an alkyl group

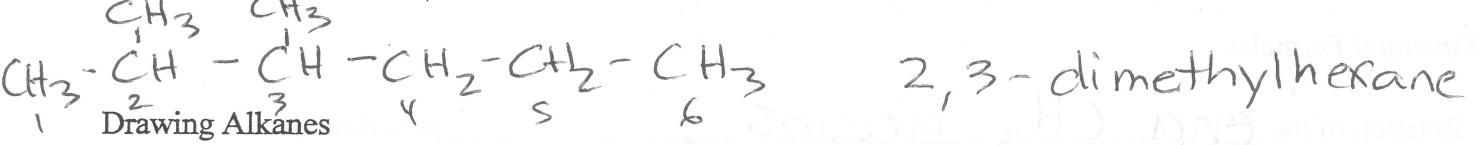
- halogen atoms are named as halo

Naming Alkanes

Guide to naming Alkanes

1. Write the alkane name of the longest continuous chain of carbon atoms
2. number the carbon atoms starting from the end nearer a substituent
3. Give the location and name of each substituent (ABC order) as a prefix to the name of the main chain

Example:



2,3-dimethylhexane

Drawing Alkanes

1. Draw the main chain of carbon atoms
2. # the chain and place the substituents on the carbons indicated by the #s.
3. Add the correct # of H atoms to give 4 bonds to each C.

Example:

2-bromo-4-Chlorobutane