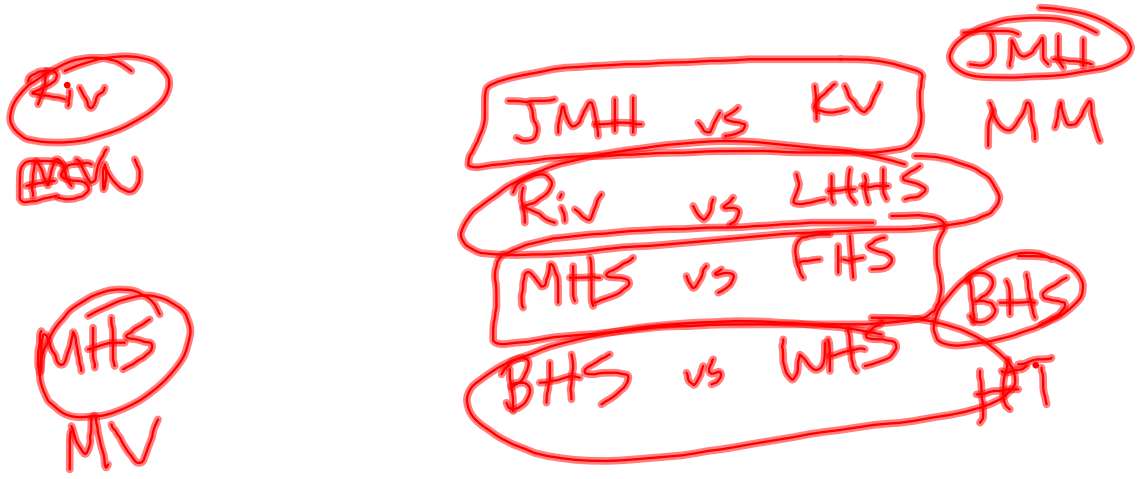
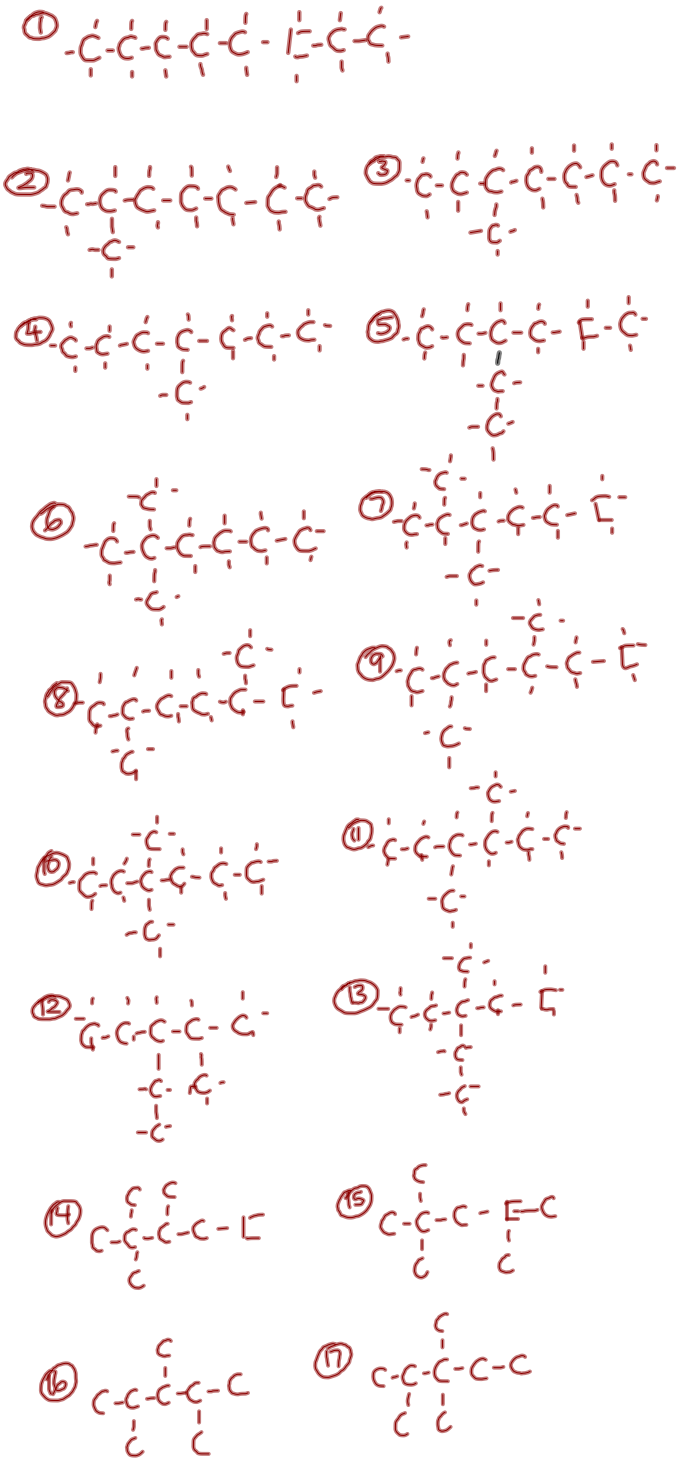
Pass in Molecular Models Investigation


Riv
MHS
MV
JMH vs KV
Riv vs LHHS
MHS vs FHS
BHS vs WHS
JMH
MM
BHS
HT

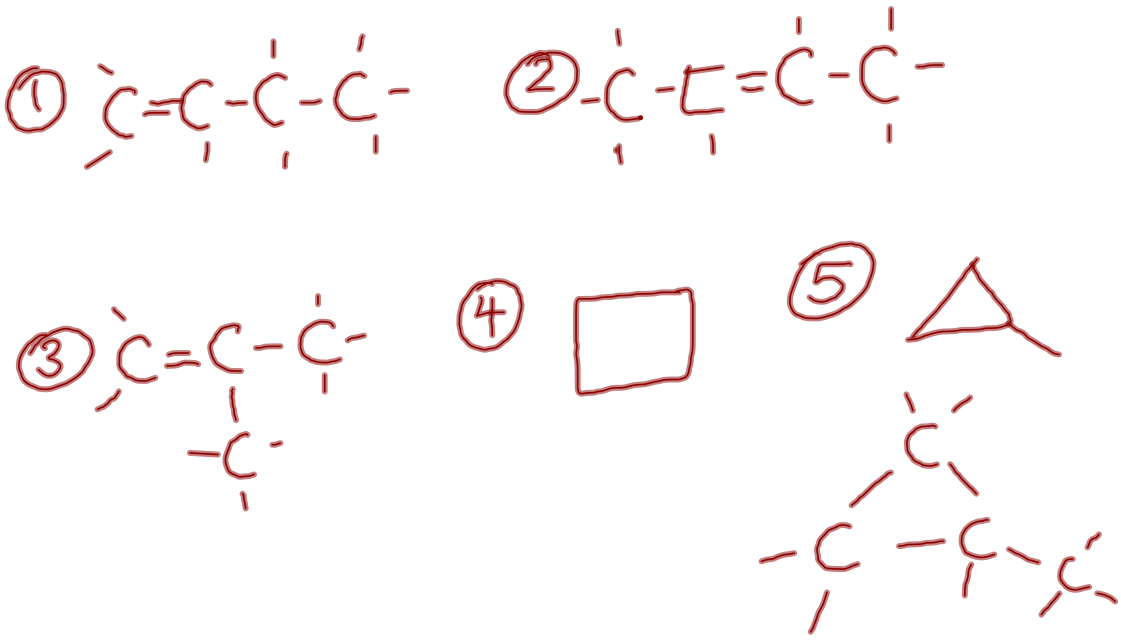
Isomers of C_8H_{18}

$C_8H_{18} \rightarrow C_nH_{2n+2} \rightarrow$ single



Isomers of C_4H_8

$C_4H_8 \rightarrow C_nH_{2n} \rightarrow$ one double bond or cycloalkane



Organic Prefixes

The prefixes for compounds or alkyl groups with one to 10 carbons are shown in the chart on p. 695.

FORMULA	IUPAC NAME	ALKYL GROUP	ALKYL NAME
CH_4	methane	$-CH_3$	methyl
C_2H_6	ethane	$-C_2H_5$	ethyl
C_3H_8	propane	$-C_3H_7$	propyl
C_4H_{10}	butane	$-C_4H_9$	butyl

The remaining 6 follow latin naming.

Chemistry 122 - Organic Naming

- each organic compound has a basic skeletal structure, called the *parent*, to which branches and functional groups have been added.
- in the naming of compounds, the branches and functional groups are specified by prefixes on the parent name.
- a **functional group** is a site of chemical reactivity in a molecule.
- carbon-carbon and carbon-hydrogen bonds (**sigma bonds**) are relatively unreactive. Ethane (CH_3CH_3) has no functional groups.
- when another type of atom is present in organic molecules, such as oxygen in ethanol (CH_3CH_2OH), the oxygen with its hydrogen is a site of chemical reactivity. A hydroxyl group (-OH) is a functional group.
- the double bond, such as the one found in ethylene ($CH_2=CH_2$) is also a site of reactivity and therefore is a functional group.
- alkanes belong to a group of compounds called **aliphatic** (from the Greek - aleiphatos meaning fat). Aliphatic denotes noncyclic organic compounds since most fats have long chains.
- An alkane is a **saturated** (has its full compliment of H's) aliphatic hydrocarbon and is relatively non-reactive.

The names of straight chain alkanes are used as parent names for all aliphatic compounds, whether or not they contain branches of functional groups.

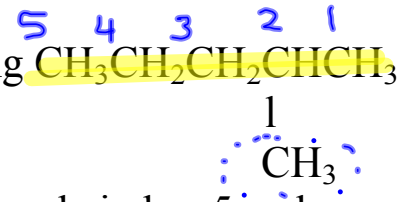
The names of the alkanes are composed of two parts. The first part tells the number of carbons in the parent chain. The second part, tells if the compound is saturated (-ane ending) or unsaturated (-ene or -yne ending)
Ex. pentane

Ring compound names are taken from the names of the continuous-chain parents with the prefix <u>cyclo</u> added. The number of carbons in the ring determines the parent name.

Ex. cyclohexane

Naming Branched Alkanes

1. find and name the longest continuous chain of carbon atoms
2. number the chain starting with the end closest to the branch

Ex. naming 

1. the longest continuous chain has 5 carbons; therefore the parent is <u>pentane</u>
2. one <u>methyl</u> alkyl group on the second carbon

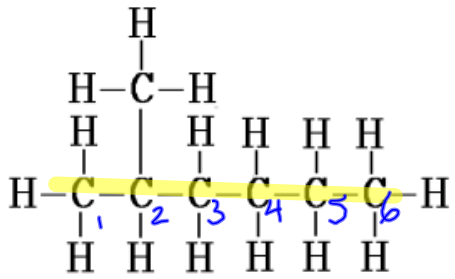
NAME: 2-methylpentane

The names of the continuous chain branches commonly encountered is based upon the number of carbons contained and uses the same latin prefixes with -yl ending

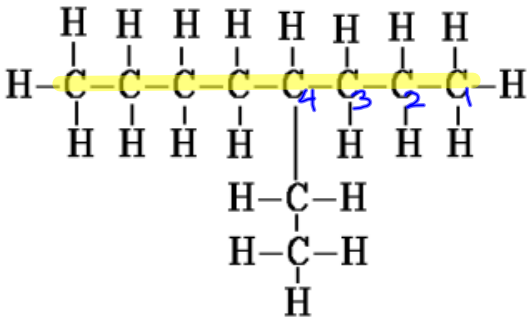
Ex. - CH_3 methyl group

- $CH_3(CH_2)_8CH_3$ decyl group

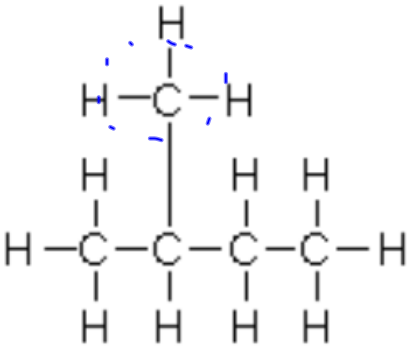
Examples



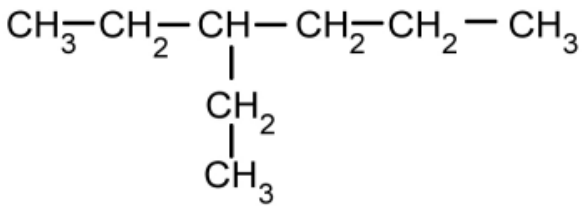
2-methylhexane



4-ethyl octane



methyl butane



ethyl hexane