

Pass in Molecular Models Investigation

Organic Prefixes

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

<u>FORMULA</u>	<u>IUPAC NAME</u>	<u>ALKYL GROUP</u>	<u>ALKYL NAME</u>
CH ₄	methane	-CH ₃	methyl
C ₂ H ₆	ethane	-C ₂ H ₅	ethyl
C ₃ H ₈	propane	-C ₃ H ₇	propyl
C ₄ H ₁₀	butane	-C ₄ H ₉	butyl



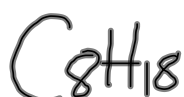
pentane



hexane



heptane



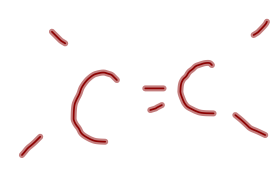
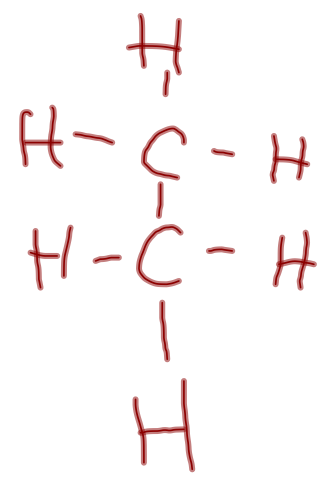
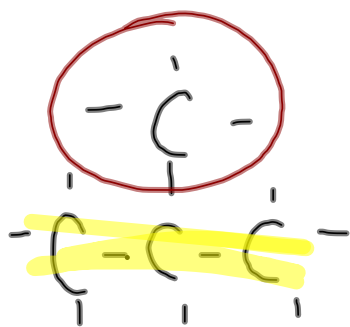
octane



nonane



decane .



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 ($\text{CH}_3\text{CH}_2\text{OH}$), 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 ($\text{CH}_2=\text{CH}_2$) 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 complement of H's) aliphatic hydrocarbon and is relatively non-reactive.

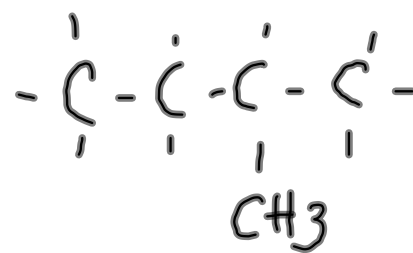
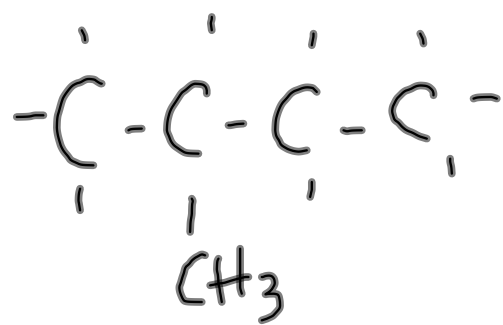
The names of straight chain alkanes are used as parent names for all aliphatic compounds, whether or not they contain branches of functional groups.

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 cyclo added. The number of carbons in the ring determines the parent name.

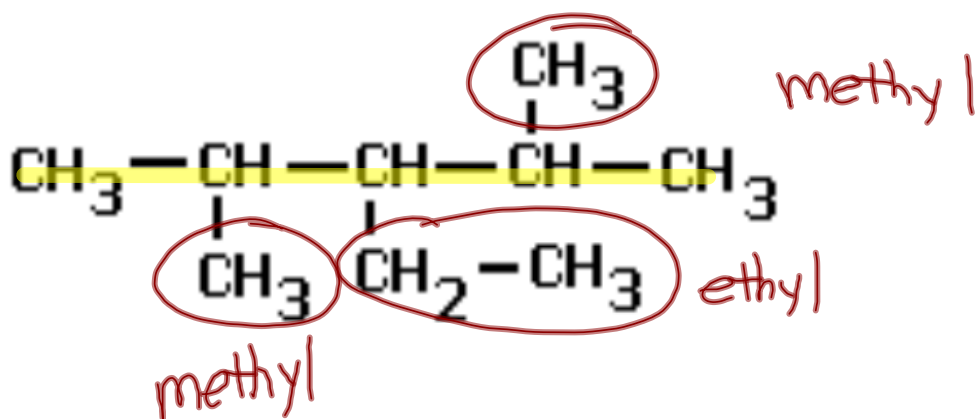
Ex. cyclohexane



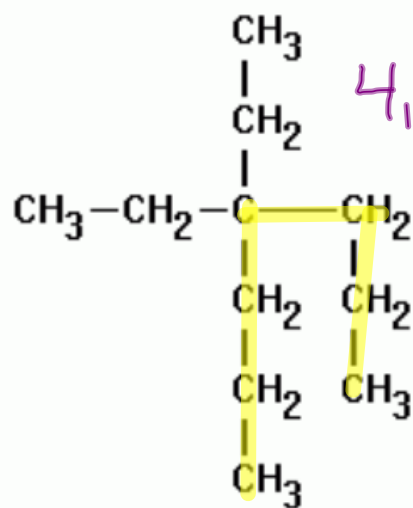
Multiple Branches

If there are multiple branches, the branches are listed in alphabetical order when writing the name of the alkane.

Ex.



ethyl-2,4-dimethylpentane



4,4-diethylheptane