Organic Chemistry

Covalent bonding:
Share e-'
Nonmetal/nonmetal covalent bonding
molecule made up of hydrogen and carbon only
molecule/cmpd  cmpd
$\text{CH}_4$  $\text{NaCl}$

Bonding  Covalent  Ionic
Melting pt  Usually low  Usually high
Boiling pt
Flammability  High  Low
Solubility in $\text{H}_2\text{O}$  Low  High

usually depends on polarity of the molecule
# of Cs = prefixes

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

Structural formula - how it is built

C_{14}H_{3}
C\_2H_{2}C\_2H\_2C\_H\_3
condensed structural formula

Points are Cs

C_{4}H_{10}
molecular formula

butane

alkane - contains only single bonds to all the Cs.
\[ -C = \begin{array}{c} \text{alkane} \\ C_4\text{H}_{10} \\ C_n\text{H}_{2n+2} \end{array} \quad \text{alkene - contains one double bond} \\
-\begin{array}{c} \text{alkyne - contains one triple bond} \\ C_4\text{H}_6 \\ C_n\text{H}_{2n-2} \end{array} \]

General formula - can easily give you the # of Hs if you know the # of Cs
$C_8H_{18}$ molecular formula

alkane

\[ \text{-C- C- C- C- C- C- C- C-} \]

octane
C₈H₁₈  alkane  molecule formula

pentane

to find the longest chain w/o lifting your pencil or going backwards
Number the carbons such that the branches have the lowest #s.
1 C = meth
pentane
4, 4, 2-trimethyl pentane
2,2,4-trimethylpentane
2,2,4-trimethyl pentane
isomers—have the same molecular formula, but different structural formulas
C–C–C–C–C–C

$\text{C}_6\text{H}_{14}$

hexane

$\text{C}_6\text{H}_{14}$

3-methyl pentane

$\text{C}_6\text{H}_{14}$

3-methyl pentane

$\text{C}_6\text{H}_{14}$

2,3-dimethyl butane

$\text{C}_6\text{H}_{14}$

hexane

(not isomers)

b/c they have the same name.
The larger the # of Cs
the more isomers.
alkenes—most include the

= when naming it.

Therefore, it must be in the
trink of the tree.
C - C = C - C - C
5 4 3 2 1

C₅H₁₀

3- Pentene

2- Pentene
\[ \ce{C-\overset{1}{\text{C}}=\overset{2}{\text{C}}-} \]

\[ \ce{C_3H_4} \]

1. porpyne
C₈H₁₆  alkene

2,3- dimethyl-3-hexene
$C_8H_{16}$

3 ethyl 1-hexene
1. d

[Diagram]

cycloalkane
cyclobutane
5-methyl
3-methyl 4-ethyl
\[\text{heptane}\]

One that weighs the most has the lowest #.

Once this happens, the lowest #s for the other branches must be figured out.
3-ethyl-6,6-dimethyl octane
C_{5}H_{10}

cyclo pentane
cyclo hexane