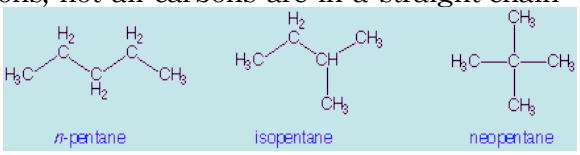
Organic Chemistry - Chapter 22-23

I. First, a bit about

A. All organic compounds consist of
   1. Because carbon is versatile in the way that it bonds.
   2. It can form
   3. It can form

II. The Most Basic of Compounds

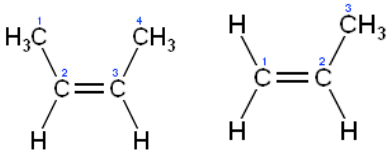
A.
   1. Contains
      a. They are
      b. They have points.
      c. They are
   2. Carbon – in the hydrocarbon (can be)
      a. hydrocarbons are the simplest in structure
      b. In hydrocarbons, not all carbons are in a straight-chain



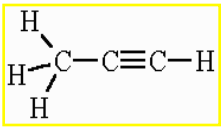
   3. Hydrocarbons
      a. : only C-C bonds, therefore
      b. : contains at least one C-C bond, therefore
      c. This is how fats are designated.
   4. formulas – , C & H are together
   5. Formula
      a. C's are represented by a
      b. Any element that is not C or H is written out.
      c. Made to make things easier to write.
      d. Example: C_3H_8 C_8H_{18} C_2H_5OH

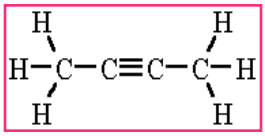
B. - saturated hydrocarbons ( )
   1. General Formula:
      a. What is the formula of:
         i. an alkane with 3 carbons?
         ii. an alkane with 32 carbons?

C. – have in the backbone.
   1. because the double bonds are easier to break.
   2. General Formula:
      a. What is the formula of:
         i. an alkene with 3 carbons?
         ii. an alkene with 32 carbons?

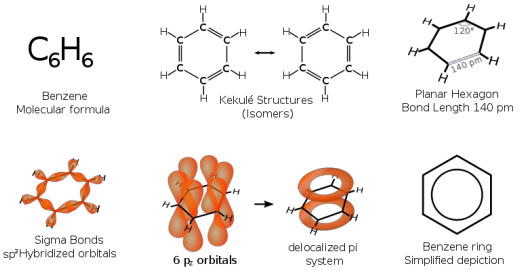


D. – have
   1. They are the hydrocarbons.
   2. General Formula:
      a. What is the formula of:
         i. an alkyne with 3 carbons?
         ii. an alkyne with 32 carbons?





E. Hydrocarbons
   1. Some hydrocarbons form
   2. Benzene:



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Complete the following chart:

# of carbons	Formula for an: alkane	alkene	alkyne
1		X	X
2			
3			
4			
5			
6			
7			
16			
23			
49			

F. : substance with the but a different arrangement of atoms (or name)

1. This explains -cis and -trans fats.
2. Sometimes a small difference can result in very different properties.
3. If you can a structure's to make it look like another, it is

   a. if you cannot, then it is an isomer
   b.
4. Another way: if you draw two structures and...
   a. they have , they
   b. they have the , they

III. Naming Rules

A. Naming alkanes:
   1. Find C backbone (largest C chain).
   2. Count the number of carbons on that chain.
   3. Write the prefix associated with that number.
      a. meth=1, eth=2, prop=3, but=4, pent=5, hex=6, hept=7, oct=8
   4. Write the suffix -ane for all alkanes.

CH_4 C_2H_6 C_3H_8 C_4H_{10}

B. Naming branches and bonds:
   1. Find C backbone (largest C chain).
   2. Number the carbons starting on the side "where the action starts."
   3. Write the number of the carbon where the first branch is located.
   4. Name that branch by replacing -ane with -yl.
   5. Repeat until all branches are named.
   6. If any, write the number of the carbon where the double or triple bonds start (lower number).
   7. Then name the longest chain. If necessary, be sure to replace the suffix with -ene (double) or -yne (triple)

Nomenclature Examples (Draw what is on the board)

C. Cleaning up your formula
   1. If there is more than one of the same group
      a. Write the number of the carbon on which they are located.
      b. Use the prefix di- (2), tri- (3) or tetra- (4) to state the number of branches there are.
      c. For multiple double/triple bonds, place the prefix before the -ene or the -yne.

D. Examples:
   A. Example A
   B. Example B

E. Summary:
1. Find backbone
2. Number carbons
3. Number and name branches (-yl)
4. Number bonds
5. Clean up multiples
6. Name the backbone and bonds

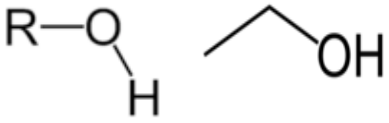
F. Drawing the structure from the name:
1. Draw the longest carbon chain with single bonds.
2. Number it from left to right.
3. If any, draw in any bonds, making sure to start the bond at the given number and draw it to the right (-ene=double, yne=triple).
4. If any, draw in branches, making sure that they are also the right length.

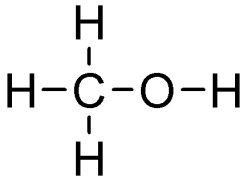
G. Examples:

IV.

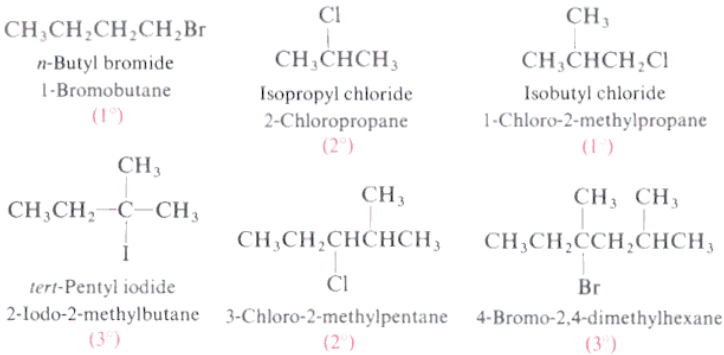
A. Organic compounds normally carry
1. Functional (fxl) groups are of an organic compound and determine its reactivity
2. are used to designate the hydrocarbon chain attached to the fxl group.

B. The Functional Groups
1.
a.
b. Simplest alcohol is
c. Large alcohols are nonpolar.

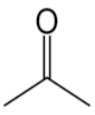


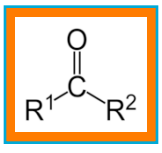


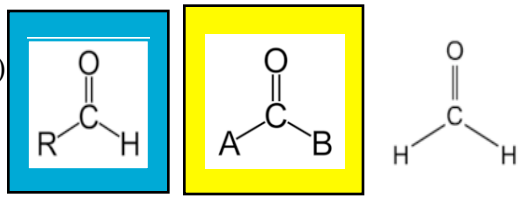
2.
a. Depending on structures, they can be reactive or unreactive.
b. deplete the ozone layer
c. HCFC's are not as bad.
d. HFC's do not affect the ozone.



3.
a. a with
b.
(This is NOT a functional group but a group of functional groups)
c. Simplest aldehyde is



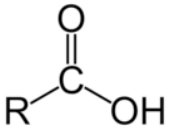


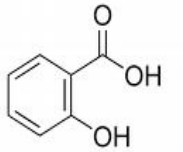


4.
a.
b. is part of this group.

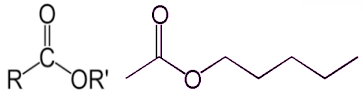
carbonyl

5.
a. weak acids with





6.
a.
b.



C. How to find functional groups
1. Cover up all carbons that are only bonded to other carbons or hydrogen.
2. Match whatever's left with the functional group that matches it.

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V. Making

A.

1.
2. Know how to find the repeating subunit in a polymer.
3. : forming molecules made of a
4. : making the polymer.

B. Biological polymers:

1. Polymer: Monomer:
2. Polymer: Monomer:
3. Polymer: Monomer:
4. Polymer: Monomer: