Organic Chemistry

- Basic Structures
  - naming
- Functional groups
  - multiple bonds
  - alcohols
  - carboxylic acids

Sep 7-3:03 PM

Organic Chemistry (organic = C compounds)

BIG, COMPLICATED CARBON MOLECULES FORM THE ESSENTIAL INGREDIENTS OF LIFE... IN FACT, CARBON COMPOUNDS ARE SO INTIMIATELY INVOLVED WITH LIVING SYSTEMS THAT CHEMISTS REFER TO ALL CARBON COMPOUNDS AS **ORGANIC.** CARBON MAKES LIFE POSSIBLE!

Organic Chemistry vs. Inorganic Chemistry

study of most C containing compounds

Exception: Not carbonates or carbon oxides

study of all substances not classified as organic compounds without C

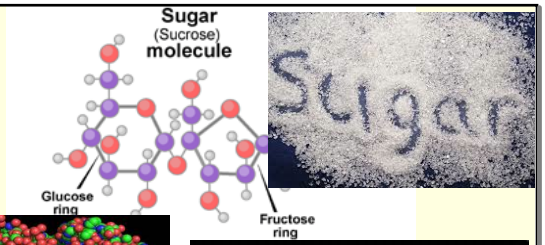
IT'S ALIVE... OR IS IT?

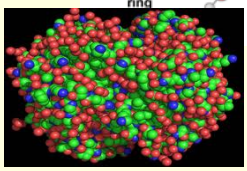
OF THE NINETY-TWO NATURALLY OCCURRING ELEMENTS, SOME HAVE COMMANDED MORE OF OUR ATTENTION THAN OTHERS: HYDROGEN, FOR ITS ROLE IN ACIDS; OXYGEN, FOR ITS REACTIVITY AND LOVE OF HYDROGEN; BUT ONLY ONE ELEMENT DESERVES ITS VERY OWN BRANCH OF CHEMISTRY: **CARBON.**

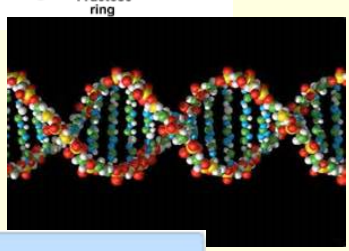
Jul 17-10:55 AM

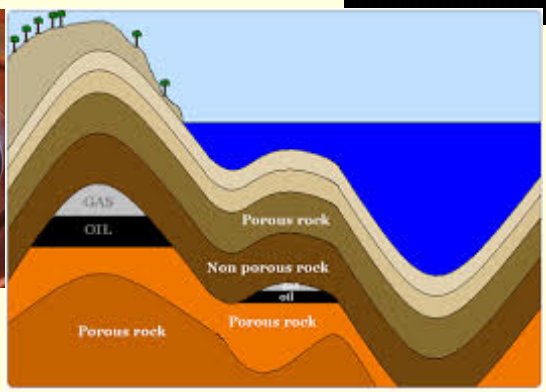
ORGANIC Compounds

1. **Natural (from living things)**
   - proteins
   - lipids
   - nucleic acids (DNA)
   - carbohydrates
   - fossil fuels (petroleum, natural gas)









2. **Synthetic (man-made)**
   - plastics
   - styrofoam
   - nylon
   - rayon
   - polyester

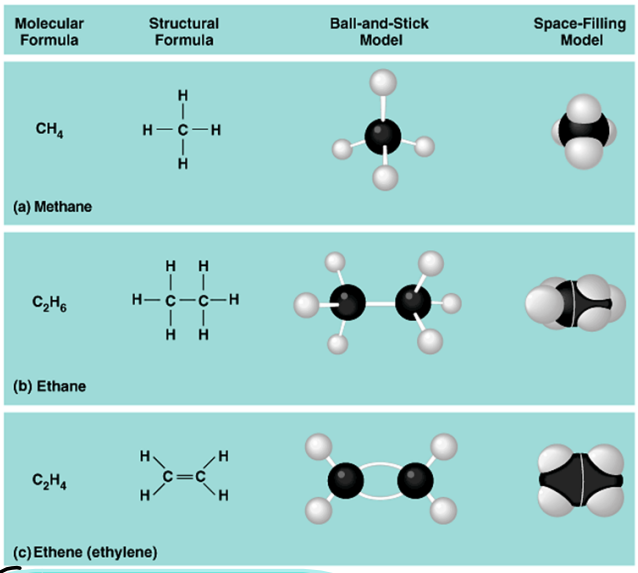
Hydrocarbons

contain:

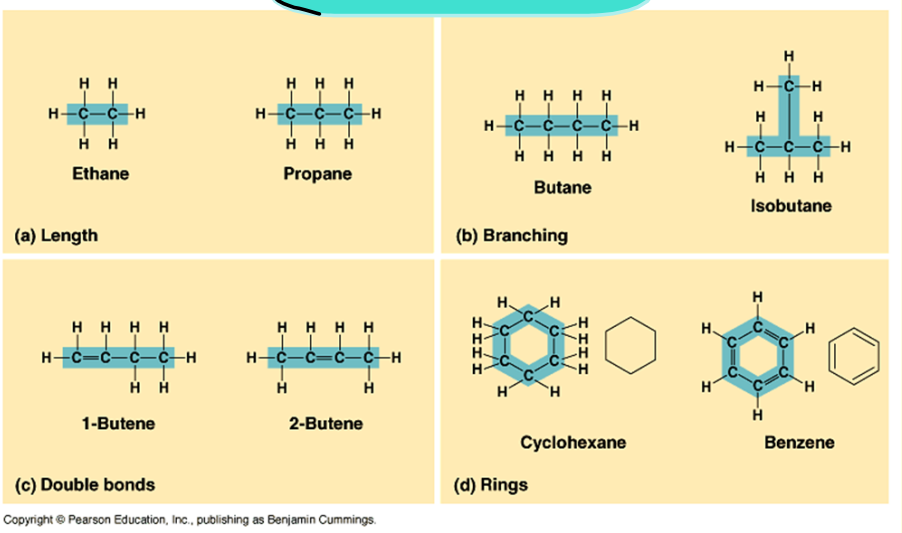
H and C

C - C bonds
and
C - H bonds
are **stable.**

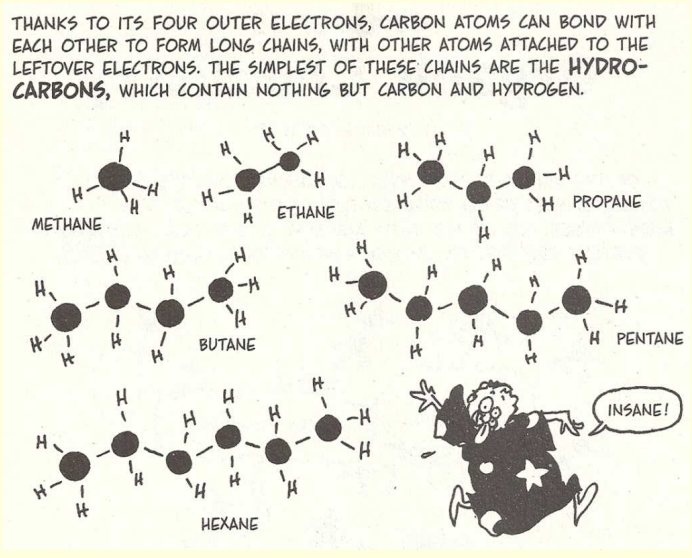
Bond type:
covalent
electrons are shared



C - C bonds create:
- straight chains
- branched chains
- cyclic or ring structures



Number of Bonds for C: ___ for H: ___



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Molecular and Structural formulas

carbons have 4 bonds

Name	molecular formula	structural formula	carbon backbone structure (no H drawn in)	stick structure
methane				
ethane				
pentane				
octane				

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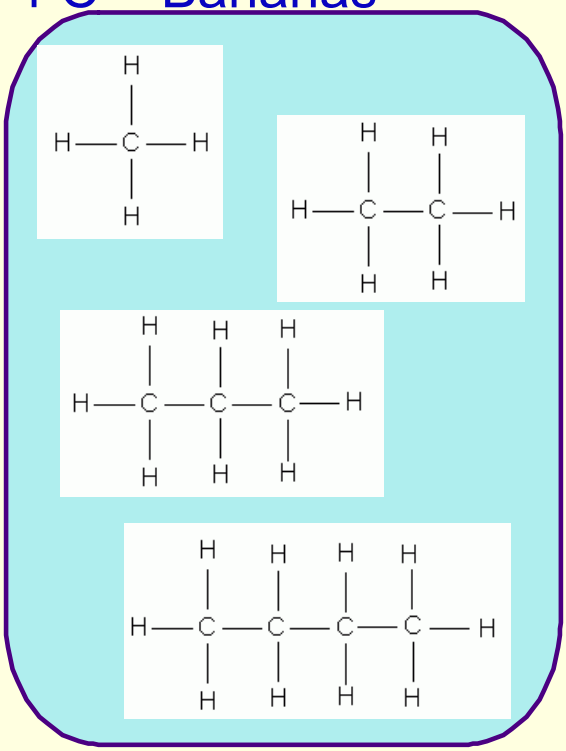
Naming:

1. If all single bonds, ends in "-ane"

2. Number of C -- given by a prefix

1	meth-	methane
2	eth-	ethane
3	prop-	_____
4	but-	butane
5	pent-	pentane
6	hex-	_____
7	hept-	_____
8	oct-	_____
9	non-	nonane
10	dec-	_____

1 C	Monkeys
2 C	Eat
3 C	Peeled
4 C	Bananas



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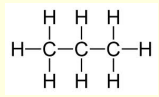
Alkanes, Alkenes and Alkynes

Alk**ane** - all single bonds

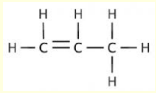
prop**ane**



general formula:

Alk**ene** - at least 1 double bond

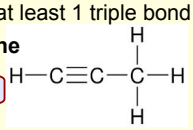
prop**ene**



general formula:

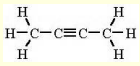
Alk**yne** - at least 1 triple bond

prop**yne**



general formula:

butyne



What names are given to these? formula?

7C, alkane

9C alkane

5C alkene

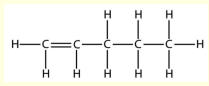
1C, alkene

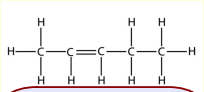
4C alkyne

2C, alkyne

Location of double and triple bonds

use number in front of name to give location of bond



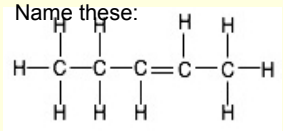


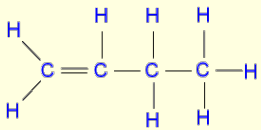
2-pentyne?

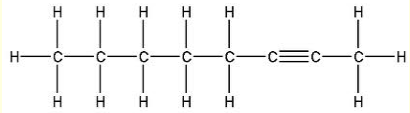
2

- **number from both ends and choose lowest number**

Name these:







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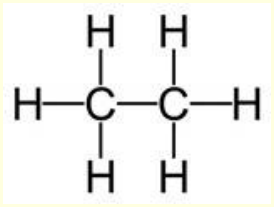
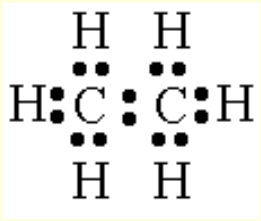
Carbon: covalent bonds

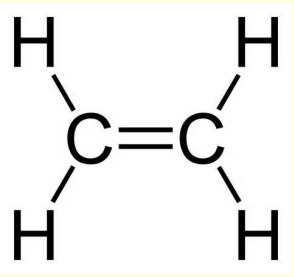
electrons are shared

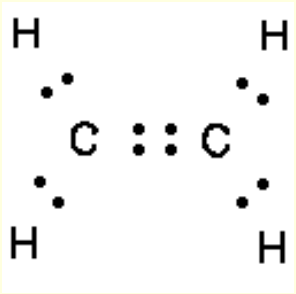
single bond = 1 line = 2 e-



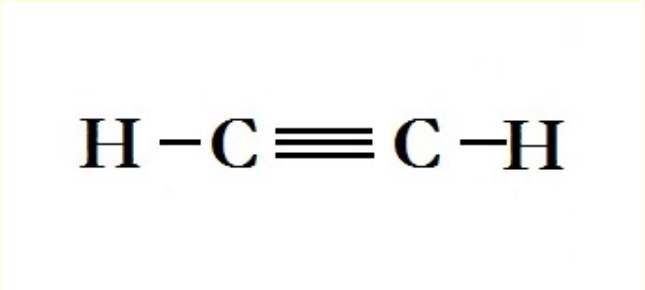


double bond = 2 lines = 4 e-

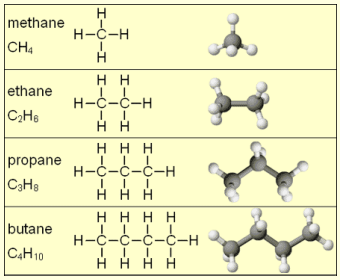


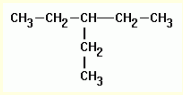


triple bond = 3 lines = 6 e-



Straight chains are easy





now let's add branches!

1. Find longest chain of C's and give alkane name

2. Find branch group and give name

1C - methyl

2C - ethyl

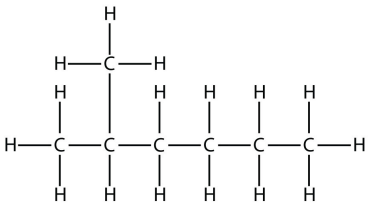
3C - propyl

3. List the groups alphabetically in front of the longest alkane

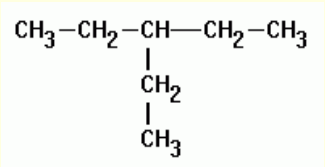
4. Number the C's of the longest chain

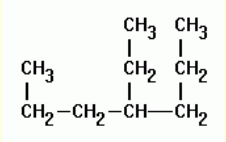
5. use C number for location of each branch

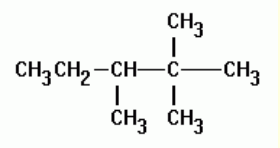
(use lowest numbers)

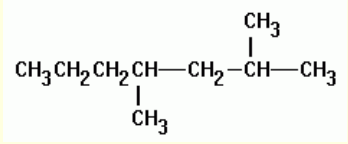


2-methyl hexane









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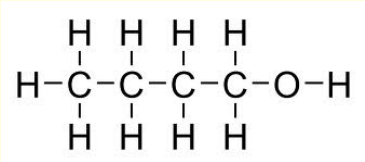
Naming and structures of alcohols

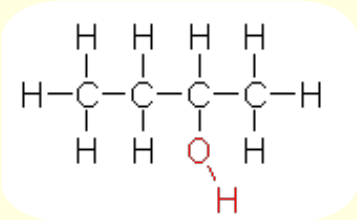
an alcohol is a hydrocarbon
with an -OH (hydroxyl group)

1. Name the alkane, drop the "e"
and add -ol

2. Use a number in front of the name to give location of hydroxyl group (-OH)
(number from both ends, use smallest number)

Name these:





give structural formula for

methanol

3-octanol

4-decanol

C - C - C - C - C - C - C - C - C - C

Carboxylic Acids

p.12, 1-4, 6-8

Jul 18-11:59 AM

Attachments

watch.webloc