Organic Chemistry
= chemistry of **CARBON** compounds
- found in all living things, + coal, petroleum, etc.
- can also be synthesized
- huge number of organic compounds!
- why??
    - > carbon has four valence electrons
    - > can make up to 4 bonds
    - > forms chains, rings, branches, sheets, sphere etc.
    - > forms single, double, triple bonds
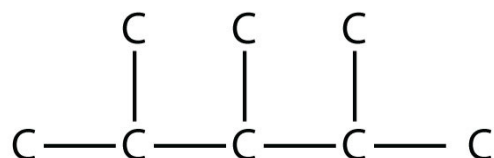   - > ISOMERS = substances with same molecular formula but different structure

    ex. $C_{10}H_{22}$ has 75 isomers!!!!

Hydrocarbons (HC)
- contain only carbon & hydrogen
- all other organic molecules are derivatives of HC
  - > H replaced by other atoms
- largest C-chain is called C-backbone

$$C — C — C — C — C$$

- simple straight chain / unbranched HC
- more complex - branched HC

$$
\begin{array}{ccccc}
C & & C & & C \\
| & & | & & | \\
C — C & — & C — & C & — C
\end{array}
$$

- reactivity of HC depends on the number & type of multiple bonds
- if all single C-C bonds
  - > stable
  - > can not incorporate additional atoms
    = SATURATED
- HC with at least one double or triple C-C bond
  - > bonds can be broken and additional atoms incorporated

    = UNSATURATED

Alkanes
- contain only single bonds $\longrightarrow$ saturated
- can be straight chained or branched
- low boiling point
- b.p. ↑ with ↑ number of atoms
- mostly liquid and nonpolar
- simplest alkane = CH_4 = **methane**
    - > produced during anaerobic decomposition of organic substances
- as alkanes grow/increase in length, addition of CH_2
    - > C_2H_6 = ethane
    - > C_3H_8 = propane

    general formula = C_nH_{2n+2}
- tetrahedral structure (p.216)

Naming Hydrocarbons

- based on number of C atoms

number of C atoms	prefix	hint
1	meth-	**M**r
2	eth-	**E**instein
3	prop-	**P**lease
4	but-	**B**ring
5	pent-	**P**enelope
6	hex-	**H**ome
7	hept-	**H**er
8	oct-	**O**veralls
9	non-	**N**eed
10	dec-	**D**rycleaning

Rules:

1) count longest chain (parent)
   - this gets ending of parent (alkanes= -ane)
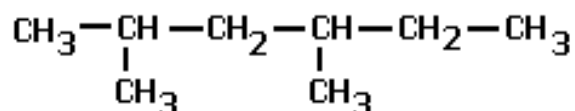
Try #2, p.218

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10	dec-	**D**rycleaning

Substituted hydrocarbons:
- number C-atoms in parent
- give number of each alkyl group followed by name of alkyl group
- if more than one group, use alphabetical order
- if same group is repeated, use di, tri, etc.
- should have lowest numbers possible

$$CH_3-CH-CH_2-CH-CH_2-CH_3$$

with CH_3 substituents below carbons 2 and 4

Do # 3 p.219
#4,5,8,9

Structure:
$$H_3C-CH_2-CH-CH-CH-CH_3$$
numbered 6, 5, 4, 3, 2, 1

with CH_3 on carbon 2 (up), CH_3 on carbon 4 (down), and CH_2-CH_3 on carbon 3 (down)