Mr. Kent's Organic Chemistry Unit Notes

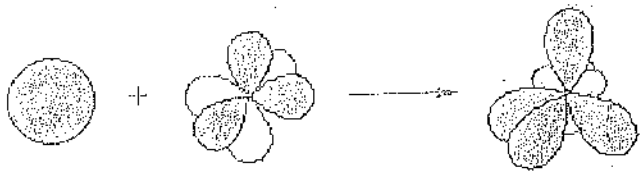
I Basic Concepts

A. Organic Chemistry-The study of _____ containing compounds.

1. They occur extensively in nature because all living things are made of _____ containing compounds.

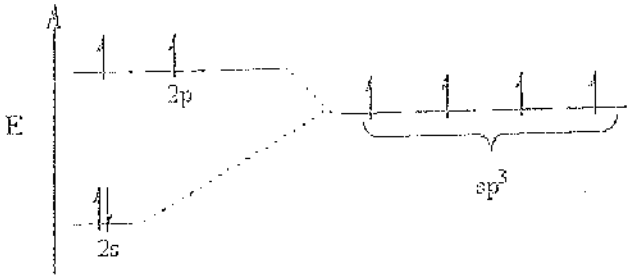
II Bonding

A. _____ can form _____ covalent bonds (_____hybrids consisting of 1_____ orbital and 3_____ orbitals)



2s $2p_x + 2p_y + 2p_z$ 4 sp^3 orbitals

When hybridized the 4 different orbitals are combined and create 4 equal energy orbitals.

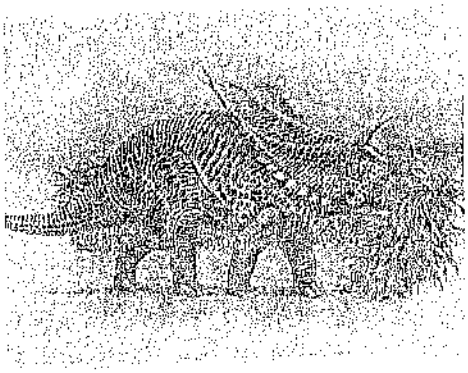


B. _____ will not only combine with other atoms, but will also bond with other _____atoms making for very large numbers of molecules.

C. Organic compounds are more numerous than _____ compounds.

D. A major source of organic compounds is _____.

Which came from _____ many years ago.



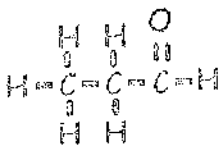
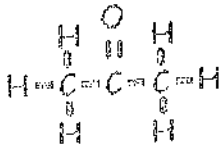
III Characteristics

1. Generally, _____ molecules (SNAP)
2. _____ dissolves in water

   Exceptions _____ & _____
3. Non-_____-generally do not conduct electricity in water, except _____
4. Melting Points are _____ due to _____ intermolecular forces
5. Chemical Reactions are _____ compared to inorganic reactions

IV Some Organic Compounds form _____.

1. Compounds with the same_____ but different _____
2. We draw structural formulas to avoid confusion
3. Example-C_3H_8O

4. As the number of carbon atoms increase, the number of isomers will _____.

V More bonding

1. Carbon atoms that are bonded together by sharing _____ electrons form a _____bond
2. Carbon atoms that are bonded together by sharing _____ electrons form a _____bond
3. Carbon atoms that are bonded together by sharing _____ electrons form a _____bond
4. _____compounds contain ALL SINGLE BONDS
5. _____ compounds contain NOT ALL SINGLE BONDS, but have double or triple bonds.

VI. Types of Organic Compounds

A. HYDROCARBONS

1. Contain only _____ and _____ atoms.
2. Homologous Series (see table _____)- each sample of a homologous series differs by the previous by ___ carbon and _____hydrogen atoms
3. Boiling Points- As the number of carbon atoms increases the boiling points _____ due to _____ intermolecular forces.

ALKANES- Saturated hydrocarbons

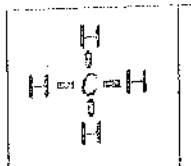
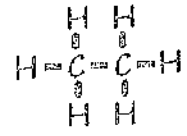
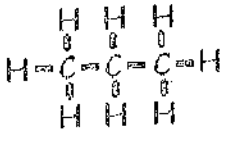
Nomenclature (Naming Rules)- end with "-ane"

General Formula

C_nH_{2n+2}

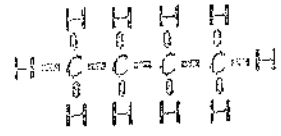
# Carbons	prefix	Molecular formula	Name
1	Meth	CH_4	
2	Eth	C_2H_6	
3	Prop	C_3H_8	
4	But	C_4H_{10}	
5	Penta	C_5H_{12}	
6	Hexa	C_6H_{14}	
7	Hept	C_7H_{16}	
8	Oct	C_8H_{18}	
9	Non	C_9H_{20}	
10	Deca	$C_{10}H_{22}$	

The first 3 alkanes have no isomers (they can only be drawn 1 way).

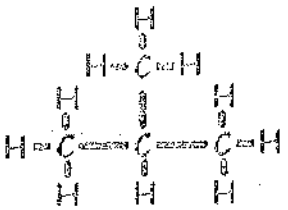
		

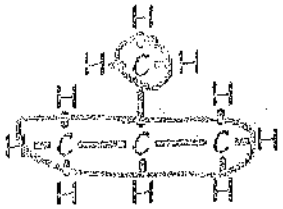
Isomers of Butane C_4H_{10}

Rule #1-Name the longest continuous chain of carbon atoms (with group), and end it with -ane.

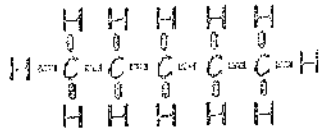
	

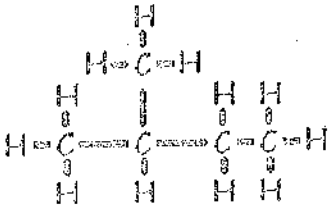
Rule #2- Remaining side chains will be given the ending -yl.

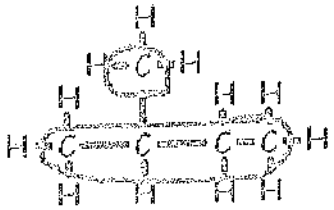




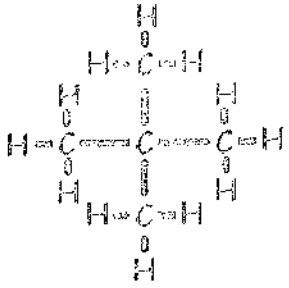
Isomers of Pentane C_5H_{12}

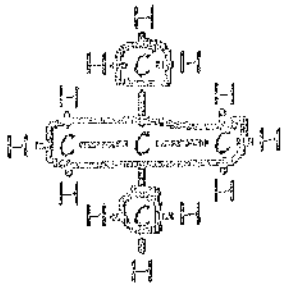




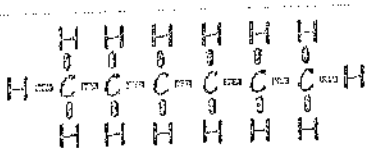
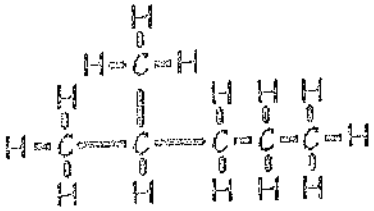
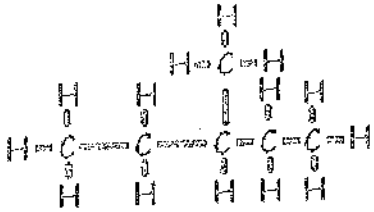


Rule #3- Multiple side chains will use prefixes 2 is di-, 3 is tri-, 4 is tetra- and so on.

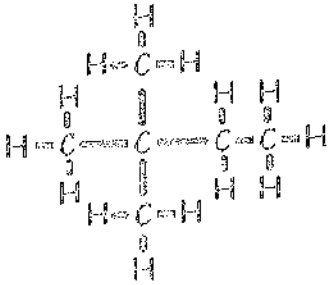


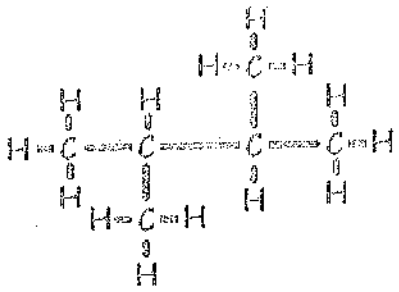
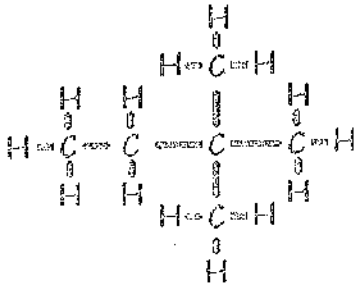


Isomers of Hexane C_6H_{14}

Rule #4- Give the ***lowest number*** location for each side chain if there is another possible location it could be located. Go back and fix the last 2 isomers

Isomers of Heptane C_7H_{16}