Why Study Organic

Functional Groups

alkane	alkene
alkyne	alcohol
ether	amine
carbonyl	aldehyde
ketone	carboxylic acid
amide	esters
nitriles	amino acid
Aromatic	thiols
alkyl halide	organometallic

Nomenclature
Straight chain saturated alkanes

Root Name	Formula	Root Name	Formula
methane		heptane	
ethane		octane	
propane		nonane	
butane		decane	
pentane		undecane	
hexane		dodecane	

Some Special Names and Cases
Alkyl Substituents

methyl

ethyl

propyl

isopropyl

butyl

sec butyl

isobutyl

tert butyl

Nomenclature Practice
Numbering the carbon chain. Branched alkanes.

n-pentane n-octane

Which end do we start numbering from?

2 methyl butane 3 methyl butane?

2 methyl pentane 3 methyl pentane 4 methyl pentane?

2,2 dimethyl pentane 3, 3 dimethyl pentane

2, 2 di methyl propane (neopentane) isopentane

Primary Carbon Secondary Carbon Tertiary Carbon Quaternary Carbon

Functional Groups and their names
What are the structural formulas for the following compounds:

pentane

2-methyl pentane

2,2,4 tri methyl pentane

3 hexene

methyl amine

ethanol

propanol

2-propanol

butyl chloride

n octanol

ethene

ethyne

3 pentanol

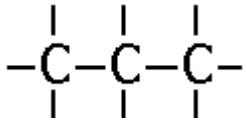
pentanal

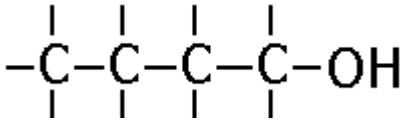
propanone

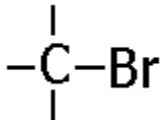
propanoic acid

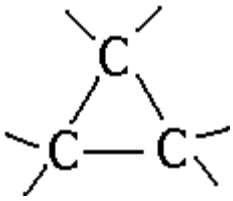
cyclohexane

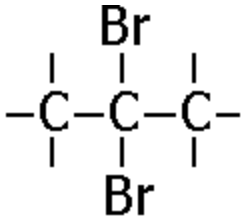
methyl ethanoate

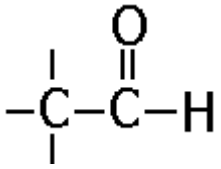
1. 

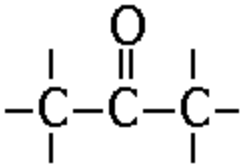
2. 

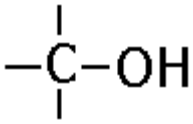
3. 

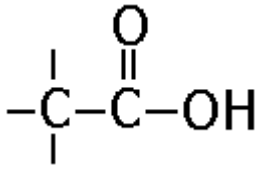
4. 

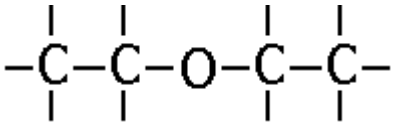
5. 

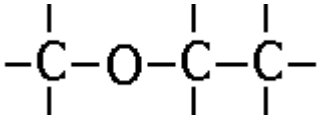
6. 

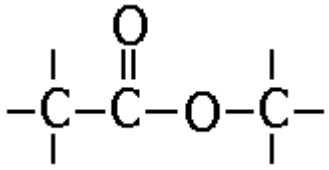
7. 

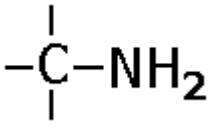
8. 

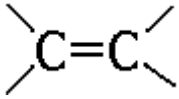
9. 

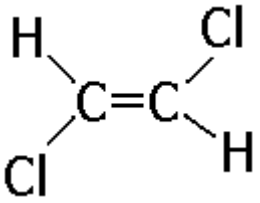
10. 

11. 

12. 

13. 

14. 

15. 

Aromatic Compounds and their derivatives

Huckel Rule

Benzene Phenyl Phenol

ortho, para, and meta

Orthodichlorobenzene Paradichlorobenzene Metadichlorobenzene

Toluene Xylene Tri Nitro Toluene

Napthalene Anthracene

Isomers

What are isomers?

Structural Isomer

C_4H_{10} (2 isomers)

C_4H_9OH (4 isomers)

$C_2H_4Cl_2$

C_2H_6O

$C_3H_6Cl_2$

C_6H_{14}

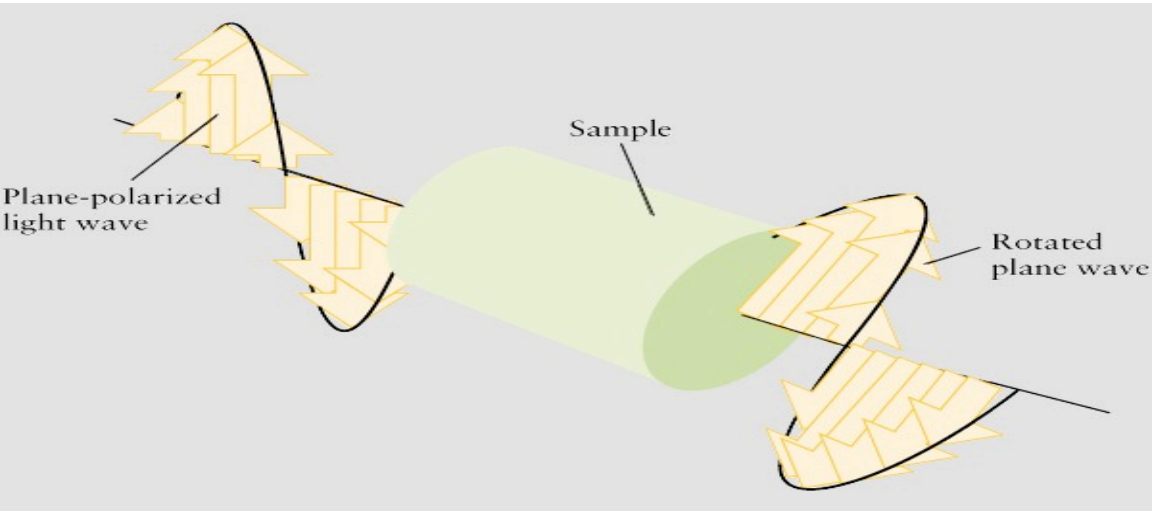
Stereo Isomer (two types)

Geometric Isomer

$C_2H_2Cl_2$

Optical Isomer

Jean Biot



Louis Pasteur

Detecting Chiral Molecules

Look for carbons containing four different groups. They are chiral!

Reactions

There are really five major types of organic reactions:

1. Substitution

2. Addition
Double bonds are electron rich and a good place to add other stuff.

3. Hydrolysis
Sometimes what we add is water.

4. Dehydration
Esterification

5. Redox
Combustion

Polymerization

Addition Polymers

Condensation Polymers (Biological Importance)

Polyester