organic compounds can be organized into families of cmpds based on groupings of atoms called <u>functional gps</u>

1. Hydrocarbons - contain only C + H
   a. alkanes - all single bonds
   b. alkenes - contain at least one C=C
   c. alkynes - contain at least one C≡C

alkanes - saturated compounds (cannot add any more H's)

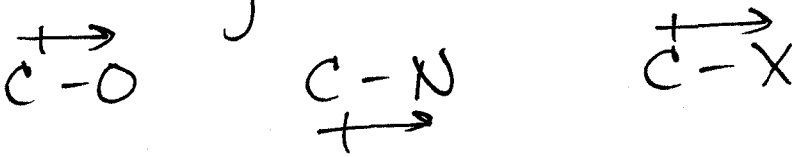
alkenes / alkynes - unsaturated (can add in more H's)

d. aromatic - contain a benzene ring

Aside: Bond polarity

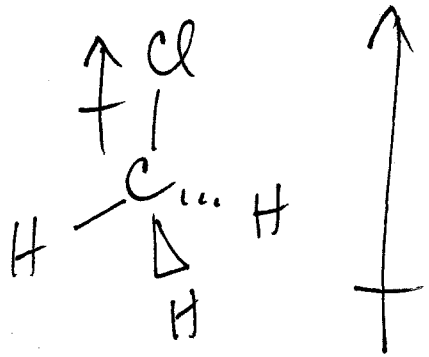
nonpolar covalent - little or no difference in e'neg. between 2 atoms
C–C, C–H etc.

polar covalent - one of the atoms is considerably more e'neg than the other

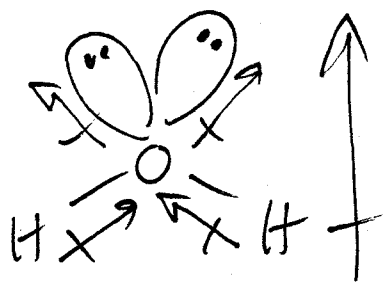


sum of the individual bond dipoles is the dipole moment of the molecule.

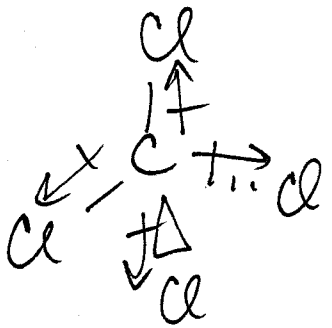
CH_3Cl



H_2O



CCl_4



nonpolar

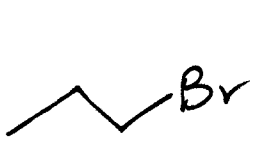
what is an alkyl group?

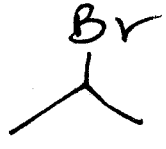
* an alkane that has had one H removed
* generally symbolized "R"

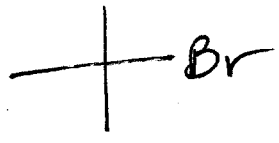
1. Hydrocarbons
   a. alkanes $R-H$
   b. alkenes $R_2C=CR_2$
   c. alkynes $R-C\equiv C-R$
   d. aromatic
      Ph-
      C_6H_5-
      Ar-
      Φ-

2. Alkyl halides $R-X$

   subgroups: 1°, 2°, 3° (primary, secondary, tertiary)





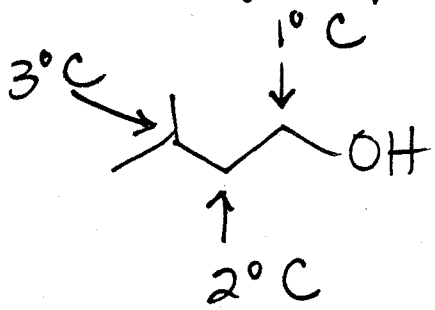


CH_3Br

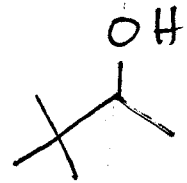
classified by how many C's are attached to the carbon bearing the halogen

3. Alcohols R-OH

subgroups: 1°, 2°, 3° (same as RX)



1° alcohol

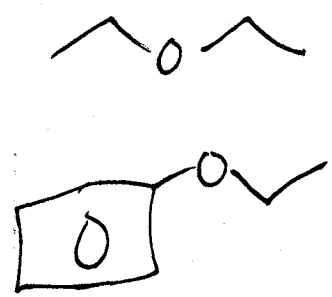


2° alcohol

4. Ethers R-O-R'

symmetrical R = R'

asymmetrical R ≠ R'



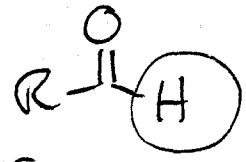
5. Amines - based on ammonia - NH_3

$R-NH_2$ 1° amine

$R-NH-R'$ 2° amine

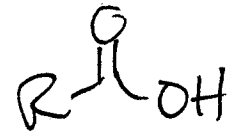
$R-N(R')-R''$ 3° amine

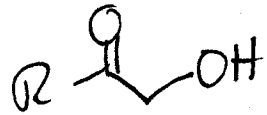
6. Carbonyls C=O

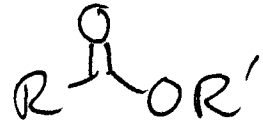
a. aldehydes  RCHO

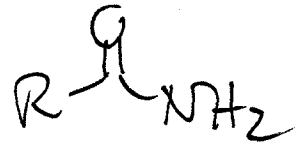
C=O has a H directly attached.

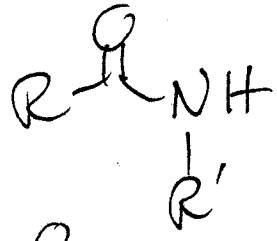
b. ketone  C=O has two R' groups

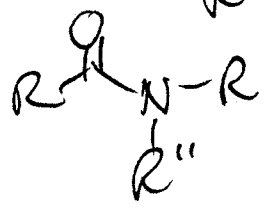
c. carboxylic acids  C=O has an OH directly attached

* NOT  (RCO_2H / $RCOOH$)

d. esters  (RCO_2R')

e. amides  1° amide

 2° amide

 3° amide

7. Nitriles $R-C\equiv N$

sp

Be able to look at a molecule + identify the functional groups.

ex. Norethindrone