

Organic Chemistry

Jan. 7th/08

- the study of carbon based compounds
- will contain carbon, hydrogen (may contain oxygen, nitrogen or halogens),
- there are lots of really complicated organic compounds
 - 95% of all compounds
 - 99.9% of all drugs
- carbon is able to form 4 covalent bonds which is the maximum possible number of bonds per atom.

bond review



Bond capabilities

- carbon $\begin{array}{c} | \\ -C- \\ | \end{array}$ or $\begin{array}{c} \diagup \\ C \\ \diagdown \end{array}$ or $-C\equiv$ or $\equiv C-$ doesn't work
- hydrogen $-H$
- oxygen $-O-$ or $O=$
- nitrogen $\begin{array}{c} | \\ -N- \\ | \end{array}$ or $\equiv N$ or $=N-$

- halogens - X (x = one of F, Cl, Br or I)
(F, Cl, Br, I)

Families of Organic Compounds

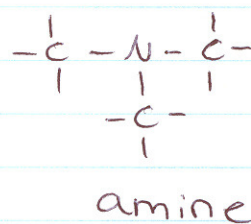
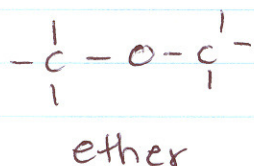
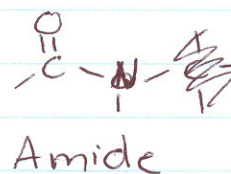
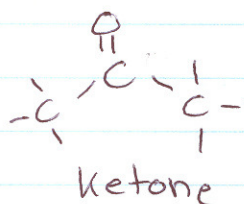
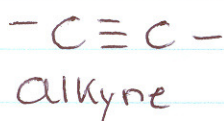
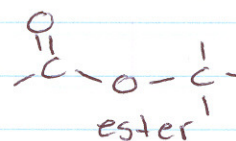
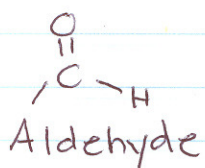
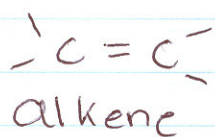
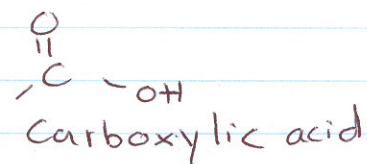
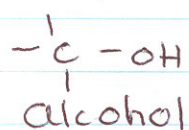
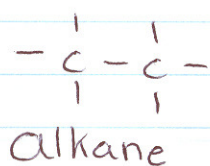
- certain arrangements in organic compounds are very common

- these arrangements are often called functional groups

- Functional groups \approx family

#	Name	Example
1.	Alkane	$\begin{array}{c} \text{H} & & \text{H} \\ & & \\ \text{H}-\text{C}- & - & \text{C}-\text{H} \\ & & \\ \text{H} & & \text{H} \end{array}$ or $\begin{array}{c} \text{H} & \text{H} & \text{H} & \text{H} \\ & & & \\ \text{H}-\text{C}- & - & \text{C}- & - & \text{C}- & - & \text{C}-\text{H} \\ & & & \\ \text{H} & \text{H} & \text{H} & \text{H} \end{array}$
2.	Alkene	$\begin{array}{c} \text{H} & & \text{H} \\ & \diagdown & / \\ & \text{C}=\text{C} \\ & / & \diagdown \\ \text{H} & & \text{H} \end{array}$ or $\begin{array}{c} \text{H} & \text{H} & & \text{H} & \text{H} \\ & & & & \\ \text{H}-\text{C}- & - & \text{C}- & - & \text{C}=\text{C} \\ & & & & \\ \text{H} & \text{H} & & \text{H} & \text{H} \end{array}$
3.	Alkyne	$\text{H}-\text{C}=\text{C}-\text{H}$ or $\begin{array}{c} \text{H} & & \text{H} \\ & & \\ \text{H}-\text{C}- & - & \text{C} \equiv \text{C}-\text{H} \\ & & \\ \text{H} & & \text{H} \end{array}$
4.	Alcohol	$\begin{array}{c} \text{H} & & \text{H} \\ & & \\ \text{H}-\text{C}- & - & \text{C}-\text{OH} \\ & & \\ \text{H} & & \text{H} \end{array}$ or $\begin{array}{c} \text{H} & \text{H} & & \text{H} & \text{H} \\ & & & & \\ \text{H}-\text{C}- & - & \text{C}- & - & \text{C}-\text{OH} \\ & & & & \\ \text{H} & \text{H} & & \text{H} & \text{H} \end{array}$
5.	Aldehyde	$\begin{array}{c} \text{H} & & \text{O} \\ & \diagdown & // \\ & \text{C}=\text{O} \\ & / & \diagdown \\ \text{H} & & \text{H} \end{array}$ or $\begin{array}{c} \text{H} & & \text{O} \\ & & // \\ \text{H}-\text{C}- & - & \text{C} \\ & & \diagdown \\ \text{H} & & \text{H} \end{array}$
6.	Ketone	$\begin{array}{c} \text{H} & & \text{O} \\ & & // \\ \text{H}-\text{C}- & - & \text{C} \\ & & \diagdown \\ \text{H} & & \text{H} \end{array}$ or $\begin{array}{c} \text{H} & & \text{O} \\ & & // \\ \text{H}-\text{C}- & - & \text{C} \\ & & \diagdown \\ \text{H} & & \text{H} \end{array}$
7.	Carboxylic Acid	$\begin{array}{c} \text{O} \\ \\ \text{H}-\text{C}-\text{OH} \end{array}$ or $\begin{array}{c} \text{H} & & \text{O} \\ & & // \\ \text{H}-\text{C}- & - & \text{C} \\ & & \diagdown \\ \text{H} & & \text{OH} \end{array}$ vinegar
8.	Ester	$\begin{array}{c} \text{O} \\ \\ \text{H}-\text{C}-\text{O}-\text{C}-\text{H} \\ & \\ \text{H} & \text{H} \end{array}$

#	name	example
9.	Amide	$\begin{array}{c} \text{O} \\ \parallel \\ \text{H}-\text{C}-\text{N}-\text{H} \\ \\ \text{H} \end{array} \quad \text{or} \quad \begin{array}{c} \text{H} \\ \\ \text{H}-\text{C}-\text{C}=\text{O} \\ \quad \\ \text{H} \quad \text{H} \\ \\ \text{H}-\text{C}-\text{H} \\ \\ \text{H} \end{array}$
10.	Ether	$\begin{array}{c} \text{H} \\ \\ \text{H}-\text{C}-\text{O}-\text{C}-\text{H} \\ \quad \\ \text{H} \quad \text{H} \end{array} \quad \text{or} \quad \begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H}-\text{C}-\text{C}-\text{O}-\text{C}-\text{C}-\text{H} \\ \quad \quad \quad \\ \text{H} \quad \text{H} \quad \text{H} \quad \text{H} \end{array}$
11.	Amine	$\begin{array}{c} \text{H} \\ \\ \text{H}-\text{N}-\text{H} \\ \\ \text{H} \end{array} \quad \text{or} \quad \begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H}-\text{C}-\text{C}-\text{N}-\text{C}-\text{C}-\text{H} \\ \quad \quad \quad \\ \text{H} \quad \text{H} \quad \text{H} \quad \text{H} \\ \\ \text{H}-\text{C}-\text{H} \\ \\ \text{H} \end{array}$



Read pg 181 → 183

Do ques. #1,2 pg 183

Read pg 184 → 185

Do ques. #3,4 pg 186