Today

Practice Interpreting Spectral Data

Introduction to Carbonyls: Nomenclature and Resonance
Sections 15.1 – 15.3

Next Class

Reactions of Carboxylic Acids and Carboxylic Acid Derivatives

Sections 15.4 -15.9

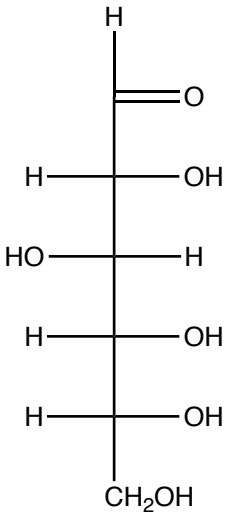
Second Class from Today

Reaction of Amides , Nitriles, and Acid Anhydrides
Sections 15.10 – 15.16

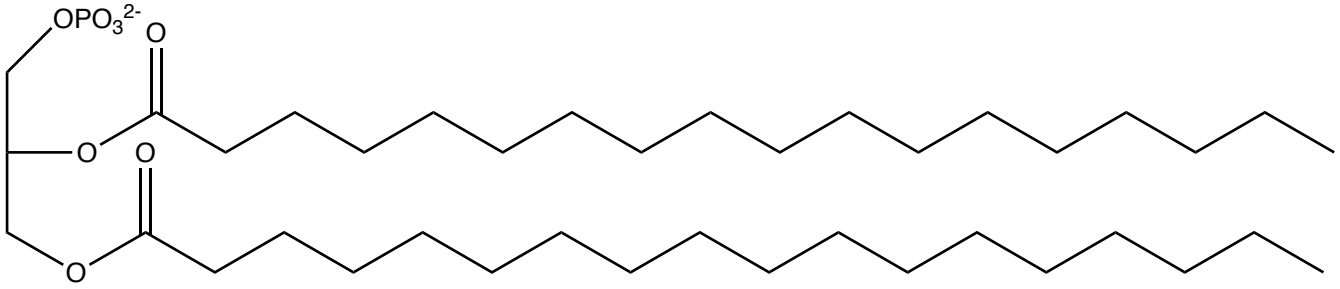
Third Class from Today

Test on Chap 10.1 – 10.4, Chap 13 (MS and IR), Chap 14 (NMR)

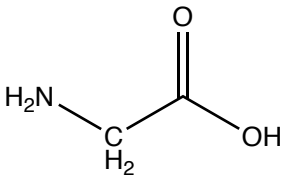
Why Carbonyls, Carboxylic Acids, and Carboxylic Acid Derivatives?



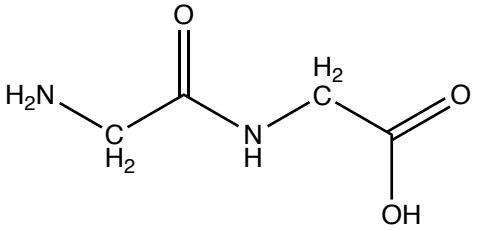
sugar



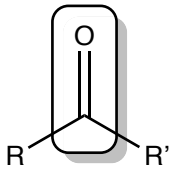
Phospholipid

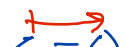


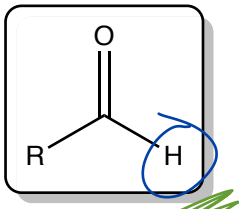
Amino Acid



dipeptide

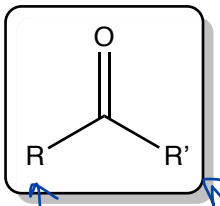


carbonyl means  carbonyl C atoms are electrophilic + they react with nucleophiles



aldehyde

aldehydes can do chemistry that ketones can't

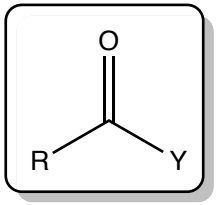


ketone

carbon atoms

these two classes of molecules do similar chemistry with nucleophiles

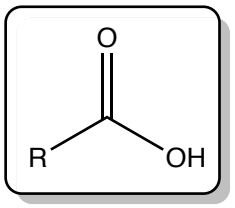
also react with nucleophiles but can do chemistry that aldehydes and ketones don't do because of the presence of the extra atom



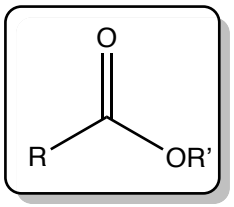
Y ≠ C, H

not C or H

something extra next to carbonyl

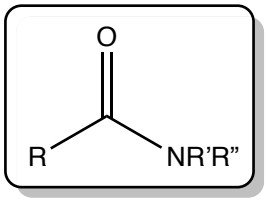


carboxylic acid

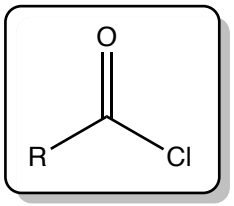


R' ≠ H

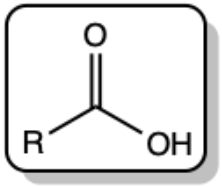
ester



amide



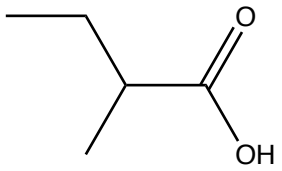
acid chlorides

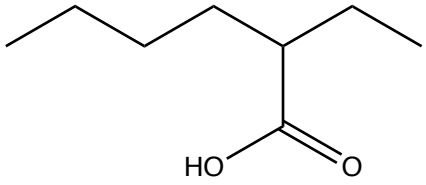


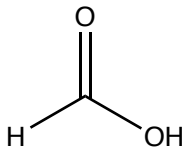
Longest chain that starts with the functional group

Remove the “e” and add “oic acid”

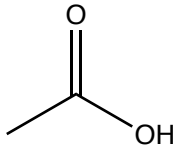
Place substituents in front of the name of the acid and number starting at the carbonyl carbon



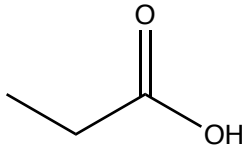




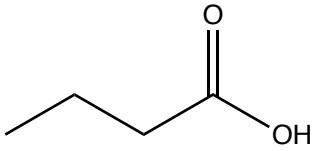
formic acid



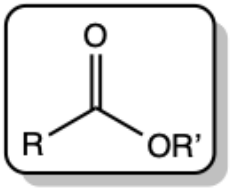
acetic acid



propionic acid



butyric acid



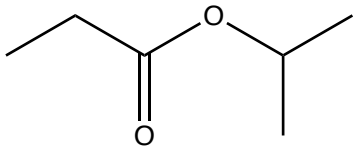
R' ≠ H

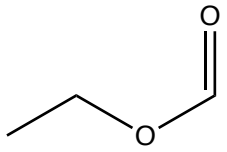
"OR group name" "carbonyl group name"

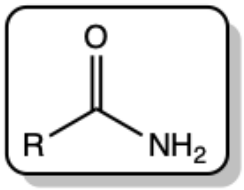
1. Group bonded to O
   a. named as though it is an alkyl substituent; that is, longest chain starting at the O, drop the "e" and add "yl"
   b. add any substituents to the beginning of the alkyl group's name

2. Name the carbonyl group
   a. the longest chain that starts with the C=O
   b. drop the "e" and add "oate"

3. name substituents by adding them to the beginning of the carbonyl group name





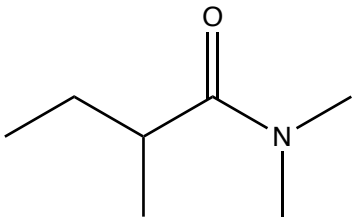


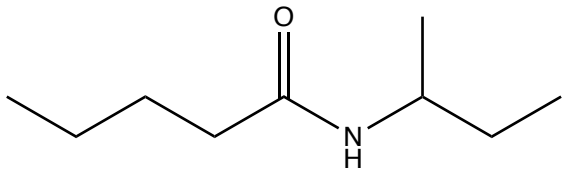
"N-substituent""carbonyl group name"

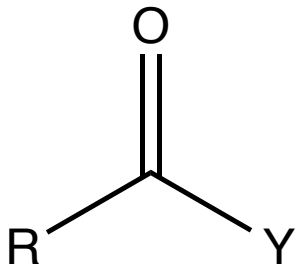
1. Groups bonded N are named as N-alkyl substituents
   a. longest chain starting at the N, drop the "e" and add "yl"
   b. substituents on alkyl group
      i. place in parenthesis at the beginning of the alkyl group's name
      ii. C atom connected to N is C-1 on the N-substituent

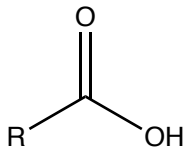
2. Name the carbonyl group
   a. the longest chain that starts with the C=O
   b. drop the "e" and add "amide"

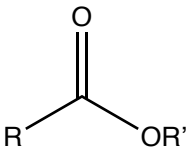
3. name other substituents by adding them to the beginning of the carbonyl group name

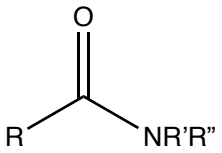


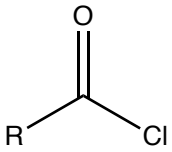



O
R
Y


O
R
OH


O
R
OR'


O
R
NR'R"


O
R
Cl

Nucleophilic Acyl Substitution