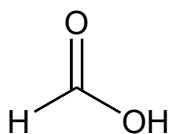


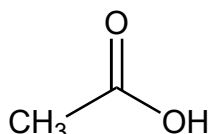
Organic Chemistry II, CHM 3150, Dr. Laurie S. Starkey, Cal Poly Pomona
Nomenclature of Carboxylic Acids & Their Derivatives (Klein Chapter 20)

Carboxylic Acid Nomenclature

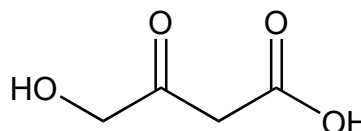
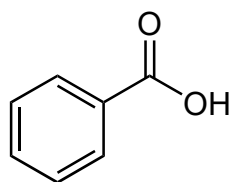
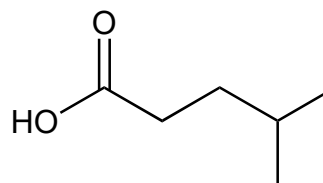
- ** Identify the longest parent carbon chain that starts at the carbonyl carbon. For a carboxylic acid (RCO_2H), the carbonyl carbon is always carbon #1.
- ** Drop the "e" and add "oic acid" to give "**alkanoic acid**" parent. *For carboxylic acids and their derivatives, no number is given to identify the position of the $\text{C}=\text{O}$ (must be carbon #1).*
- ** A carboxylic acid (or any of its derivatives) has a higher priority than ketones or aldehydes, so any other $\text{C}=\text{O}$ on the carbon chain is described as an "oxo" substituent.



(formic acid)

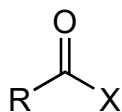


(acetic acid, AcOH)

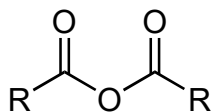


Carboxylic Acid Derivatives

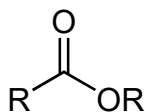
General structure:



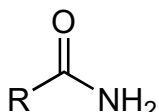
acid halide



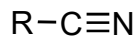
anhydride



ester



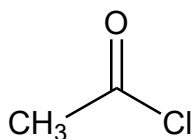
amide



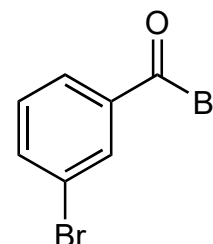
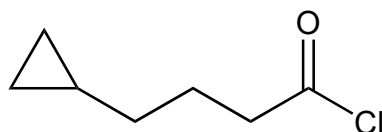
nitrile

Acid Halide Nomenclature

- ** Identify the longest parent carbon chain that starts at the carbonyl carbon. For an acid halide (RCOX), the carbonyl carbon is always carbon #1.
- ** Drop the "e" and add "oyl halide" to give "**alkanoyl halide**" parent.



(acetyl chloride)



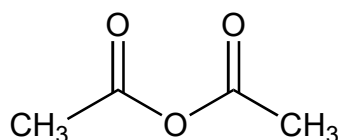
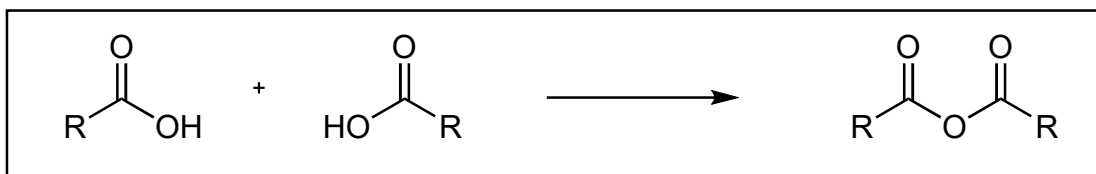
Acid Anhydride Nomenclature

IUPAC 20-2

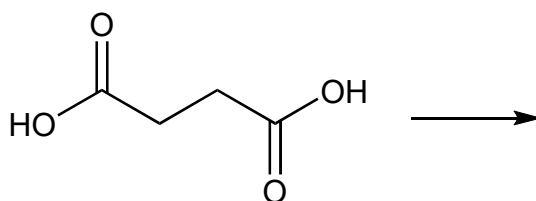
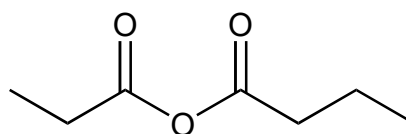
** Identify the related carboxylic acid from which it is derived.

** Change the word "acid" to "anhydride" to give "**alkanoic anhydride**" parent.

** For mixed anhydrides, list both acid groups before the word "anhydride".



(acetic anhydride)

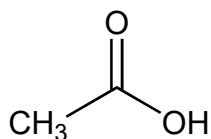


(succinic acid)

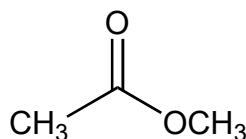
Ester (RCO₂R') Nomenclature

** Identify the related carboxylic acid from which it is derived, and name the alkyl group attached to the oxygen atom (the R' part of the OR' group).

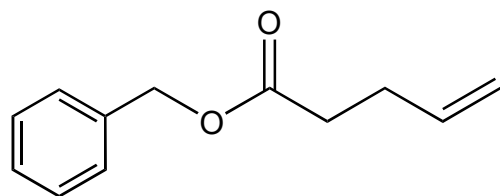
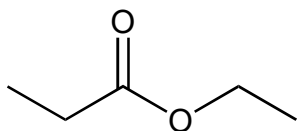
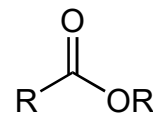
** List the alkyl group first, and change the parent "oic acid" to "oate" to give "**alkyl alkanoate**" name.



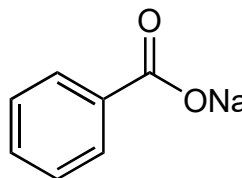
(acetic acid)



(methyl acetate)



Use same strategy to name carboxylate salts:



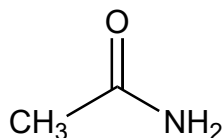
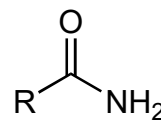
Amide Nomenclature

IUPAC 20-3

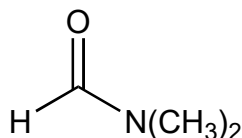
** Identify the longest parent carbon chain that starts at the carbonyl carbon.

For an amide (RCONH₂), the carbonyl carbon is always carbon #1.

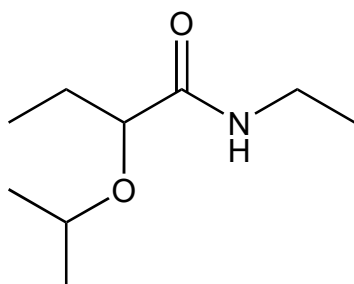
** Drop the "e" and add "amide" to give "**alkanamide**" parent. List other alkyl groups as *N*-substituents.



(acetamide)



(*N,N*-dimethylformamide, DMF)



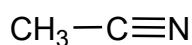
Nitrile Nomenclature

$\text{R}-\text{C}\equiv\text{N}$

** Identify the longest parent carbon chain that starts at the cyano carbon.

For a nitrile (RCN), the cyano carbon is always carbon #1.

** Simply add "nitrile" to give "**alkanenitrile**" parent (do NOT drop the "e").



(acetonitrile)

