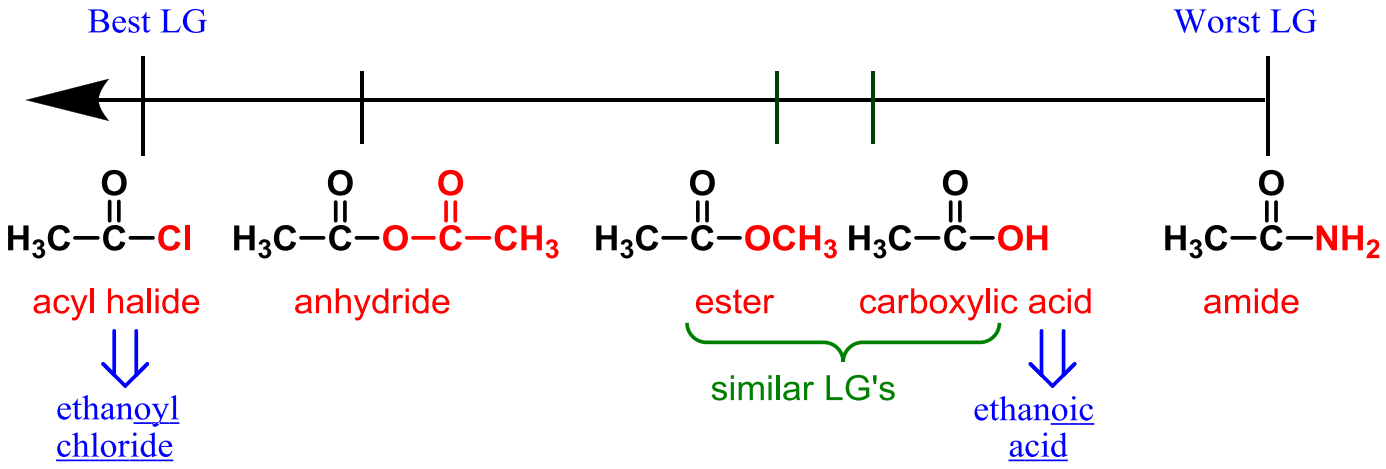
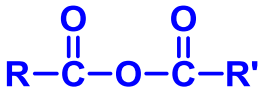
Overheads: - Outline

Recap Wednesday: Carbonyl Compounds With LG's



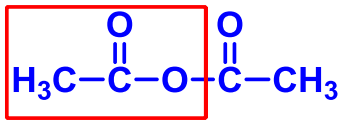
3) Anhydrides:



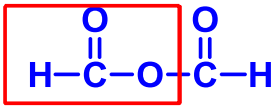
two types: symmetrical (R = R') **much more common
unsymmetrical or mixed (R ≠ R')

symmetrical:

- name after corresponding carboxylic acid ($1/_2$ of molecule)
- replace "acid" with "anhydride" (still 2 words)



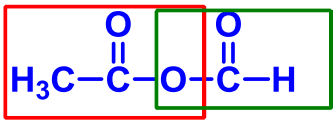
ethanoic anhydride
or acetic anhydride



methanoic anhydride
or formic anhydride

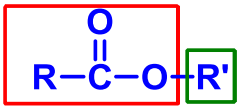
mixed:

- name each half separately (alphabetical order) & add "anhydride" (3 words)



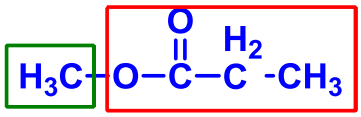
ethanoic methanoic anhydride
or acetic formic anhydride

4) Esters:



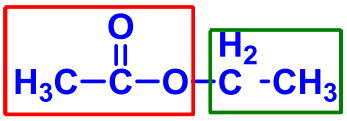
carbonyl part — alkyl group — name both parts separately (2 words)

a) for acyl group, replace "-ic acid" from acid with "-ate" - 2nd word
b) for alkyl group attached to the O - name as regular alkyl group - 1st word



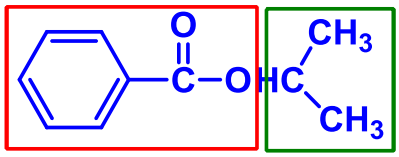
- propanoic acid

methyl propanoate



ethyl ethanoate or ethyl acetate

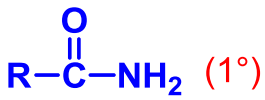
- ethanoic or acetic acid



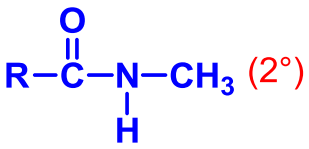
isopropyl benzoate

- benzoic acid

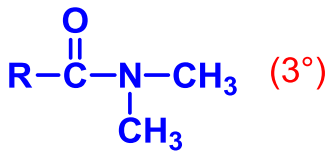
5) Amides: - can be 1°, 2° or 3° like amines



(1°)

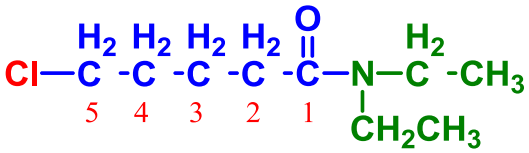


(2°)



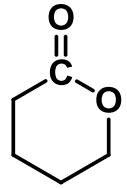
(3°)

Naming:
- longest C chain including C of C=O (= C#1)
- replace "-e" with "-amide" (all one word)
- substituents on N (for 2°/3°) = "N"-alkyl (instead of number)

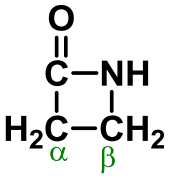


5-chloro-N,N-diethylpentanamide
NOT -amine !!

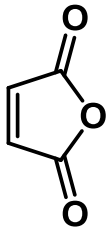
Cyclic Compounds (don't worry about names)



a lactone

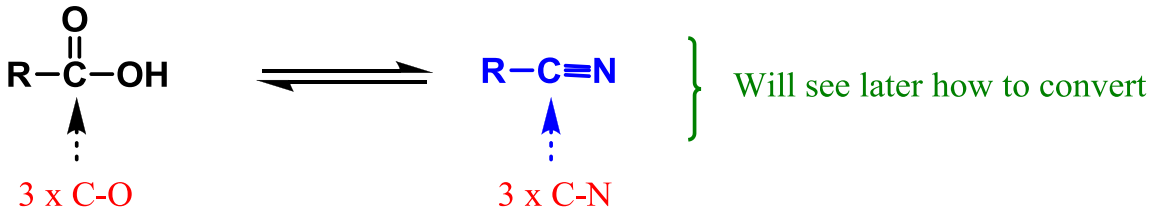


a lactam
β-lactam
- common in antibiotics like penicillin



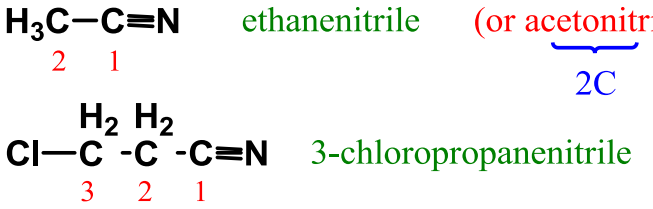
maleic anhydride
- Diels-Alder lab

Nitriles: R–C≡N -related to carbonyls

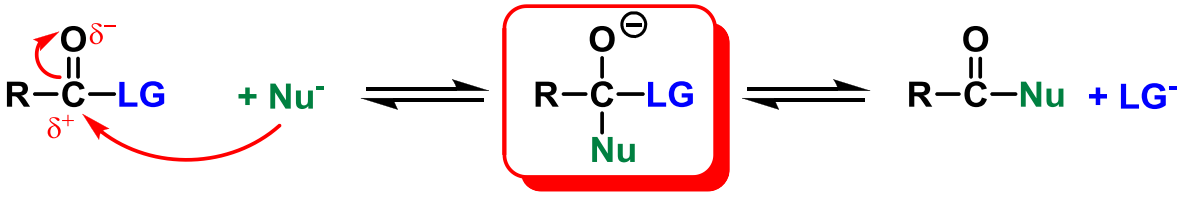


Naming: ⇒ longest C chain including C of C≡N (=C#1)

⇒ add "nitrile" to name of alkane (1 word)

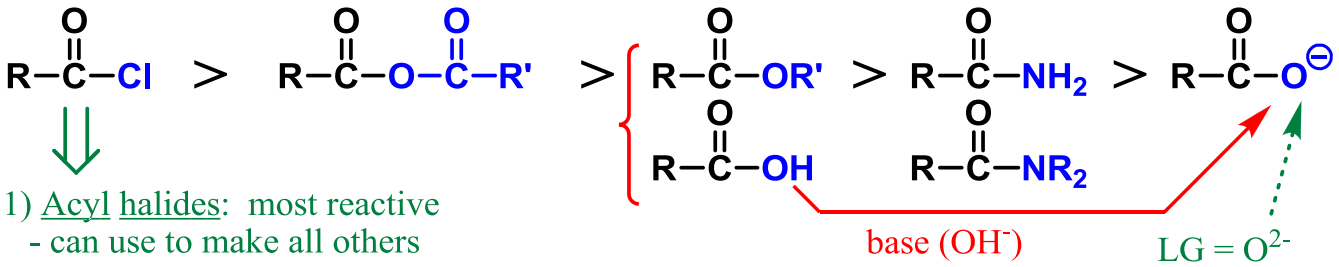


Reactions of Carbonyl Compounds



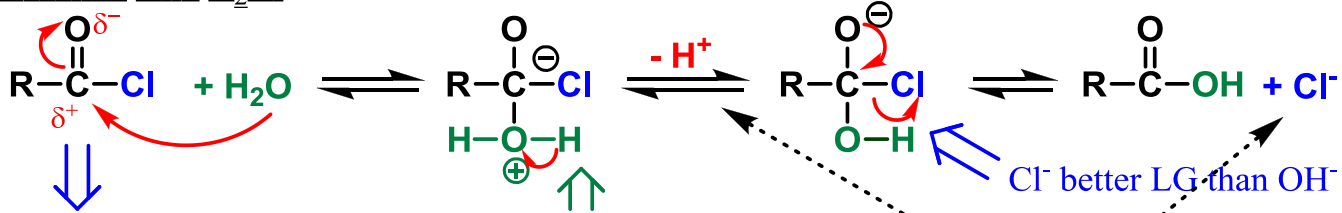
** tetrahedral intermediate
- no C^+
- O- helps kick out LG, so don't need great LG!

General Rule: Better LG leaves!



1) Acyl halides: most reactive
- can use to make all others

Reaction with H_2O:



∴ must avoid water to store acyl halides

for neutral Nu^- need extra step to remove H^+

Similarly: