Today

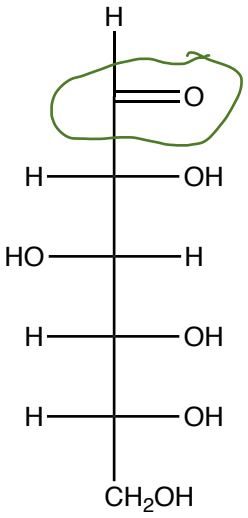
Introduction to Carbonyls: Nomenclature and Resonance
Chap 15.1 - 15.3

Next Class

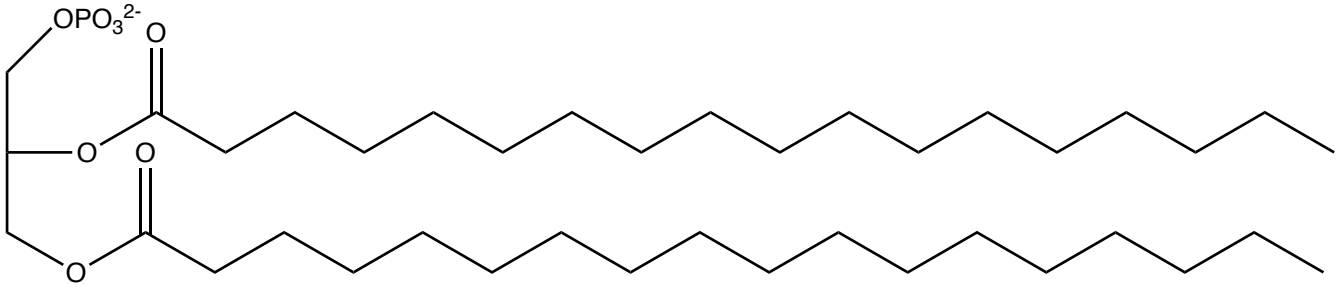
Reactions of Carboxylic Acids and Carboxylic Acid Derivatives

15.4 -15.9

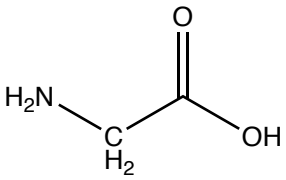
Carbonyls, Carboxylic Acids, and Carboxylic Acid Derivatives



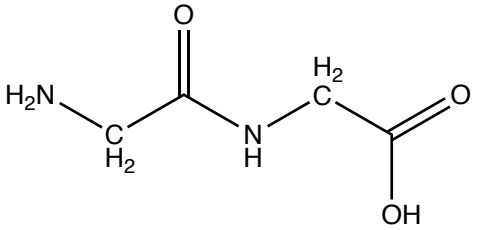
sugar



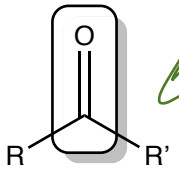
Phospholipid



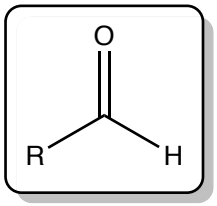
Amino Acid



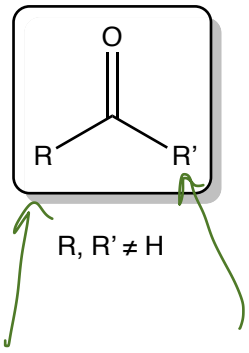
dipeptide



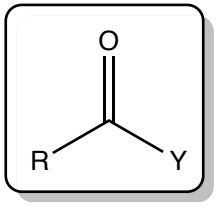
carbonyl is the C=O



aldehyde glucose aldose

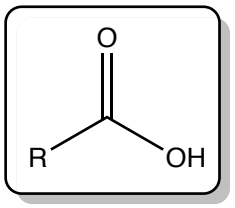


ketone fructose ketose

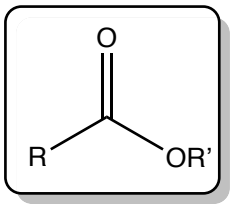


Y ≠ C, H

carboxylic acid & carboxylic acid derivatives

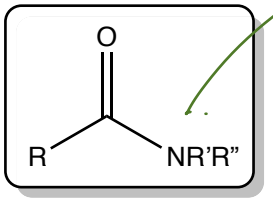


carboxylic acid

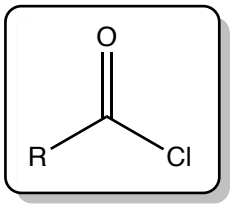


R' ≠ H

ester O

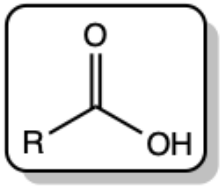


amide



acid chloride

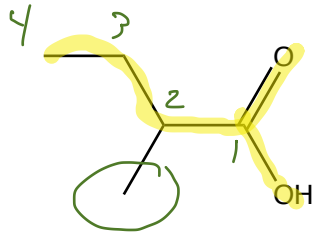
—N— amine



Longest chain that starts with the functional group

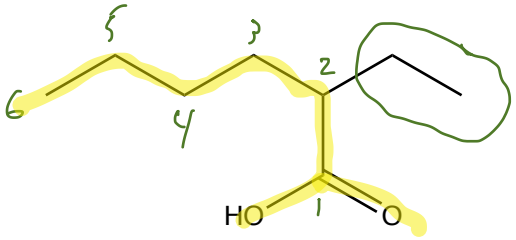
Remove the “e” and add “oic acid”

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



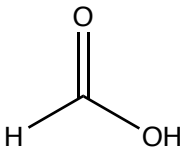
butanoic acid

2-methylbutanoic acid



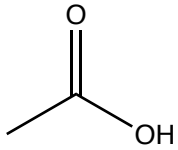
2-ethylhexanoic

IUPAC



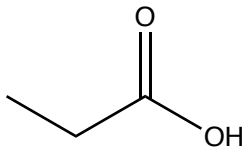
methanoic acid

formic acid



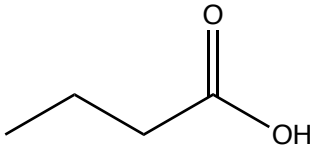
ethanoic acid

acetic acid



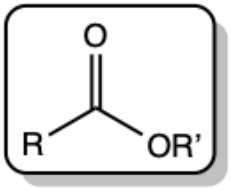
propanoic acid

proplonic acid



butanoic acid

butyric acid



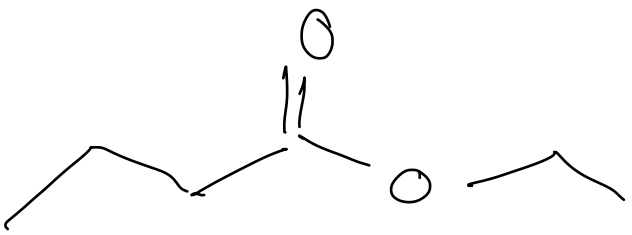
R' ≠ H

"OR group name" "carbonyl group name"

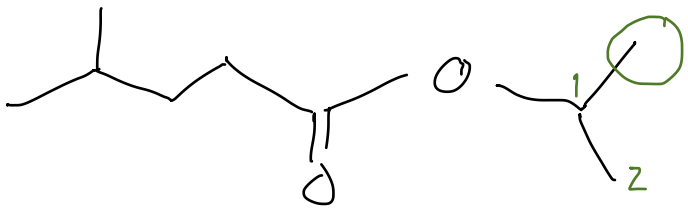
1. Group bonded to O
   a. named as though it is an alkyl substituent; that is, longest chain starting at the O, drop the "e" and add "yl"
   b. add any substituents to the beginning of the alkyl groups name

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

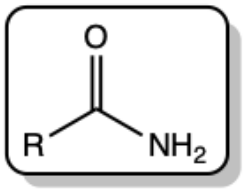


ethyl butanoate



isopropyl

1-methylethyl 4-methylpentanoate



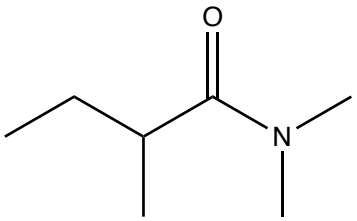
no space

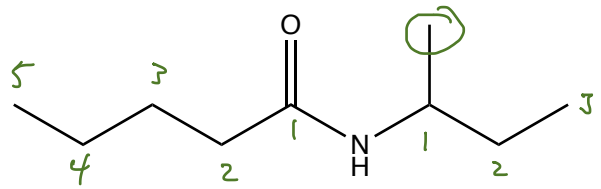
"N-substituent""carbonyl group name"

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"

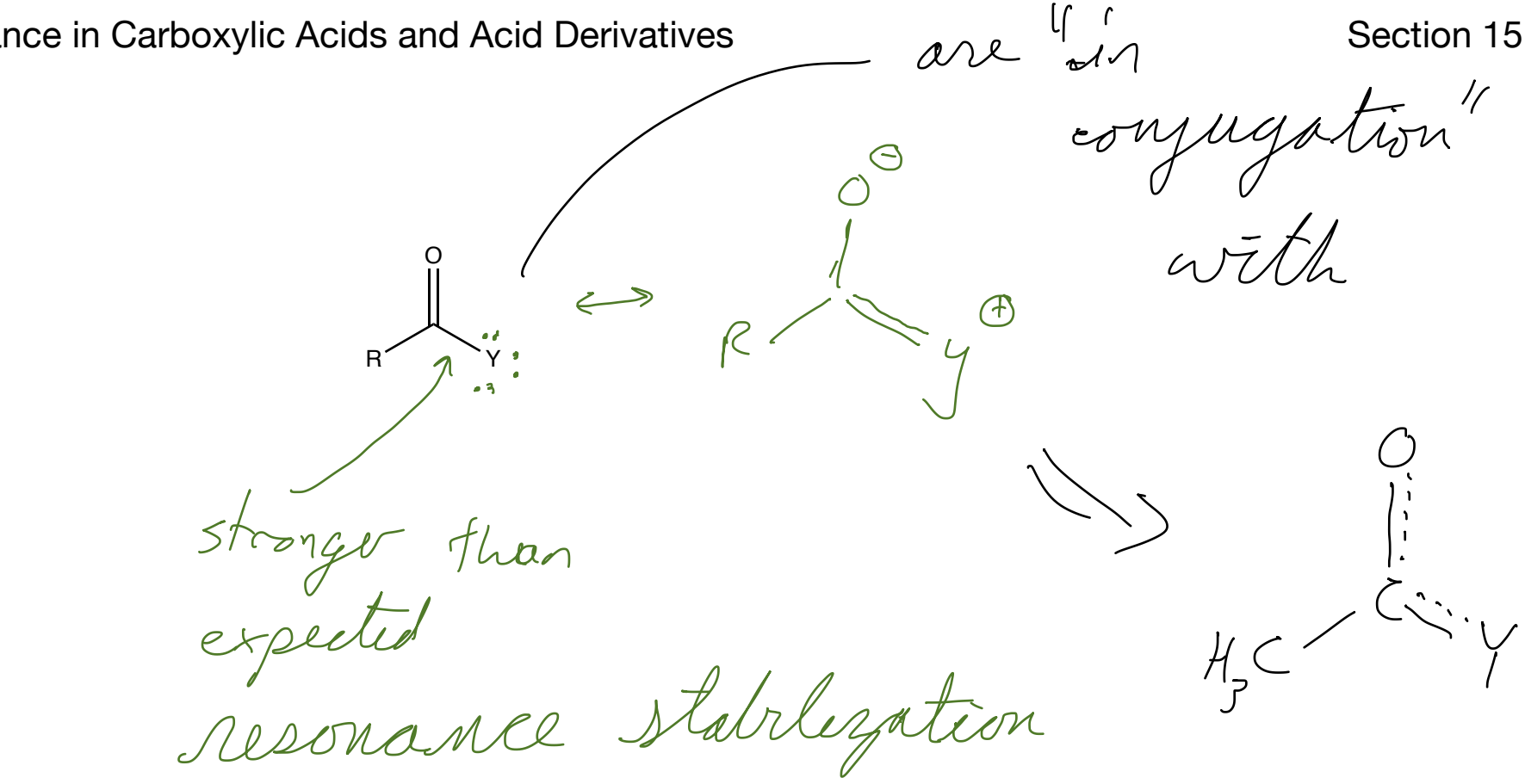
3. name other substituents by adding them to the beginning of the carbonyl group name

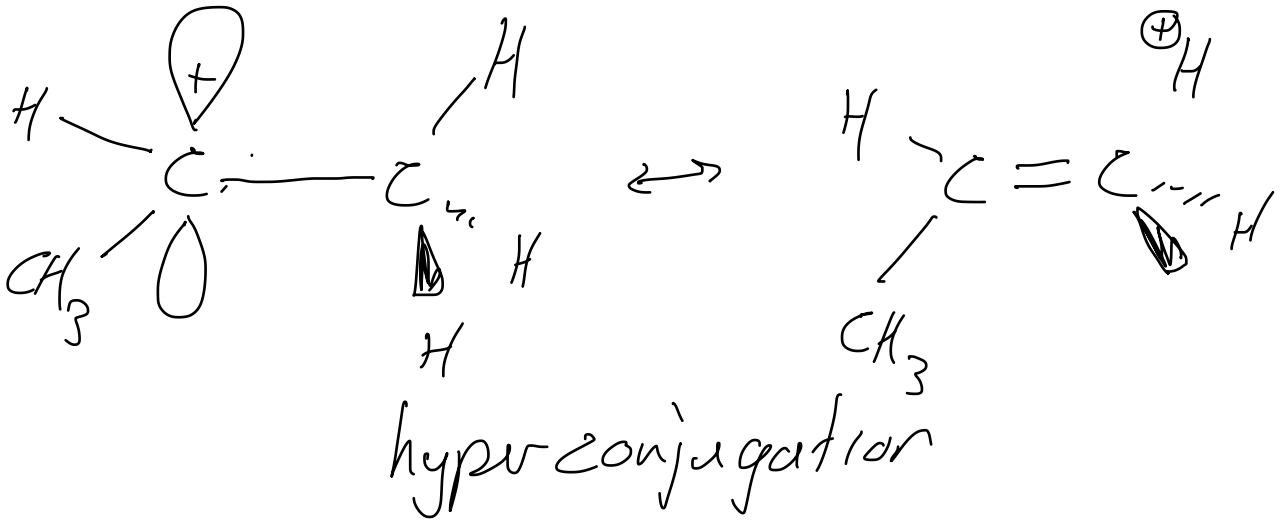


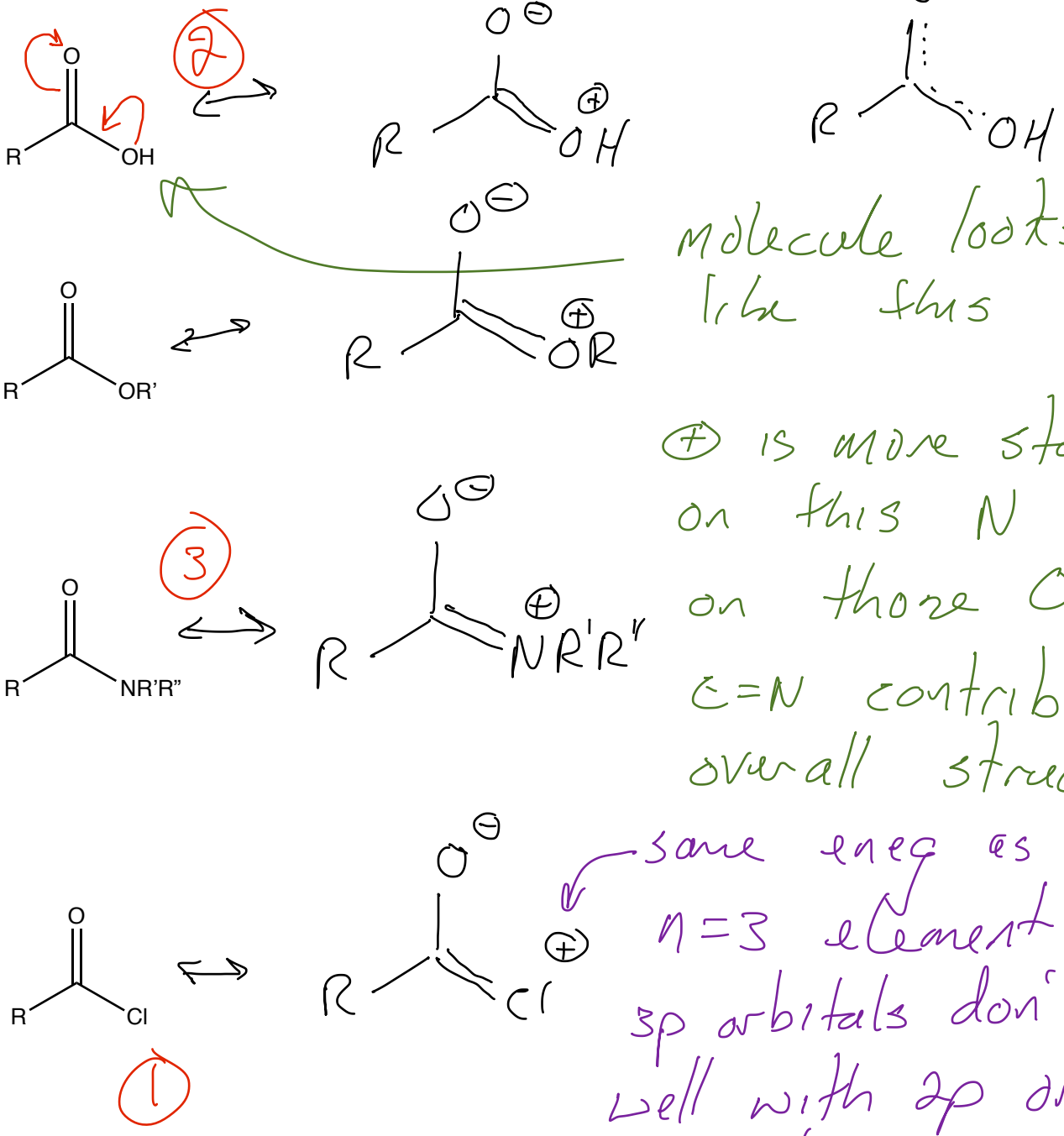


N,N,2-trimethylbutanamide

N-(1-methyl)propylpentanamide


are "in conjugation" with
stronger than expected resonance stabilization


hyperconjugation



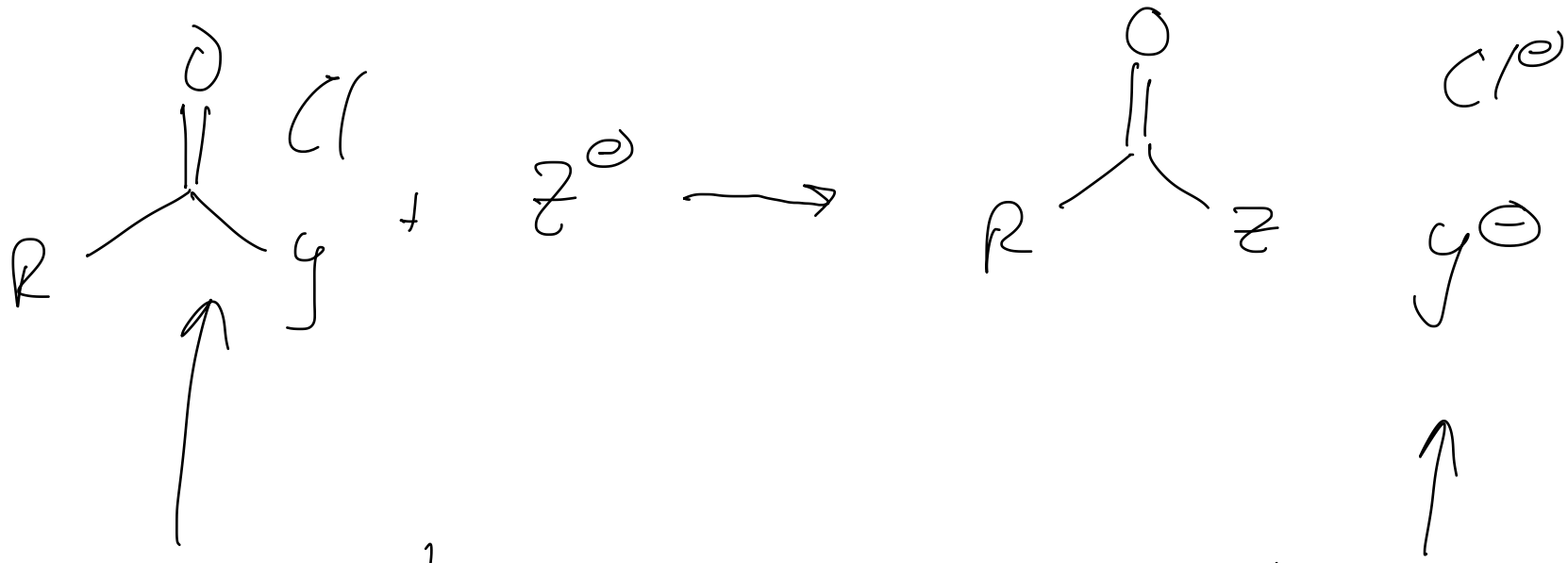
molecule looks more like this one

Forcing eneg atom to be ⊕ so C-OR bond isn't strengthened much

⊕ is more stable on this N than on those O's, C=N contributes more to the overall structure

same eneg as N but n=3 element 3p orbitals don't match well with 2p orbitals on C so there is less π bond character

most reactive



how strong is this bond

N

how stable is this anion N^-