Today

Reactions of Carboxylic Acids and Carboxylic Acid Derivatives

Sections 15.4 -15.9

Next Class

Reactions of Carboxylic Acids and Carboxylic Acid Derivatives

Sections 15.4 -15.9

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

Second Class from Today

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

Aldehyde and Ketone Nomenclature
Section 16.1

Relative Reactivities
Section 16.2

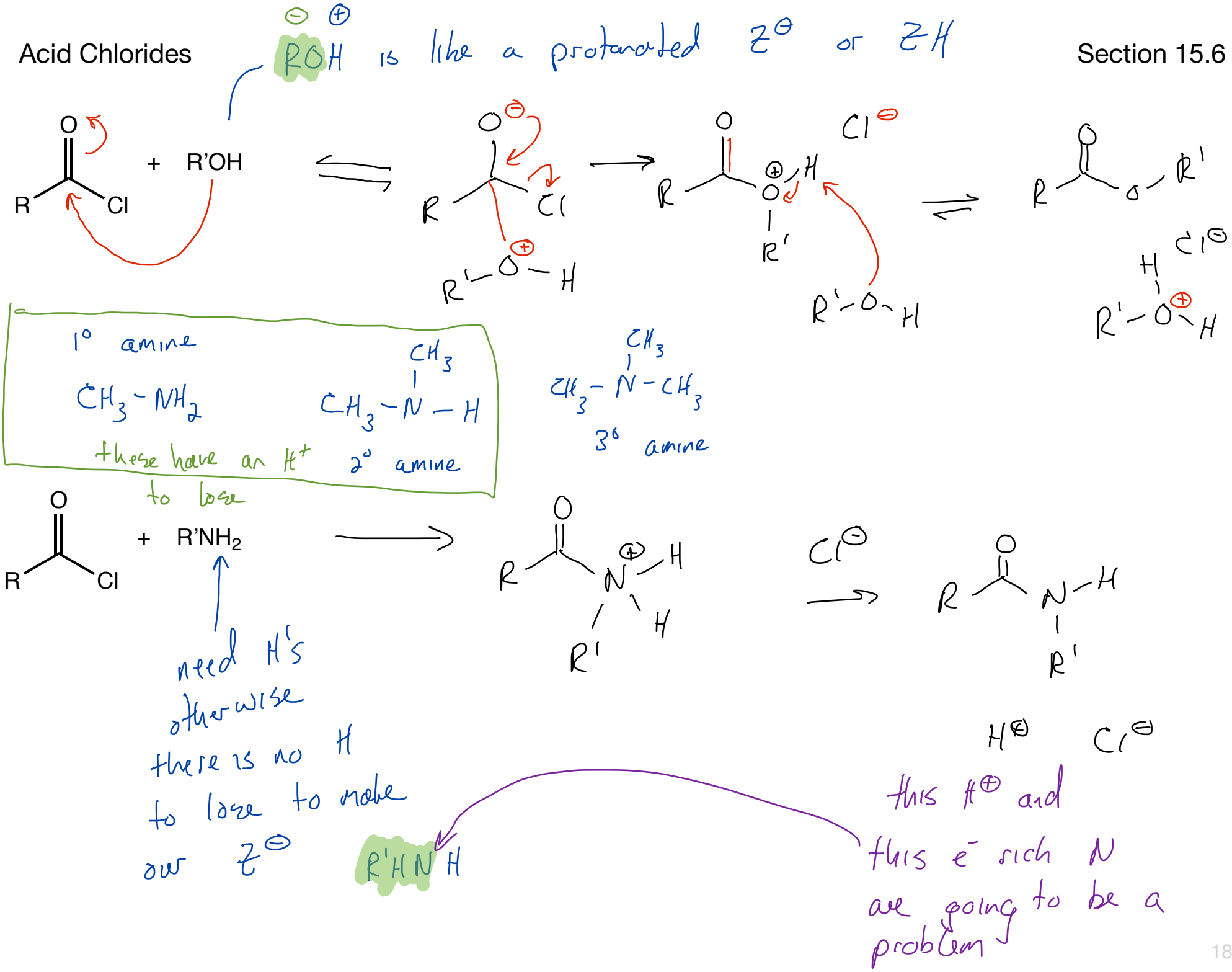
Third Class from Today

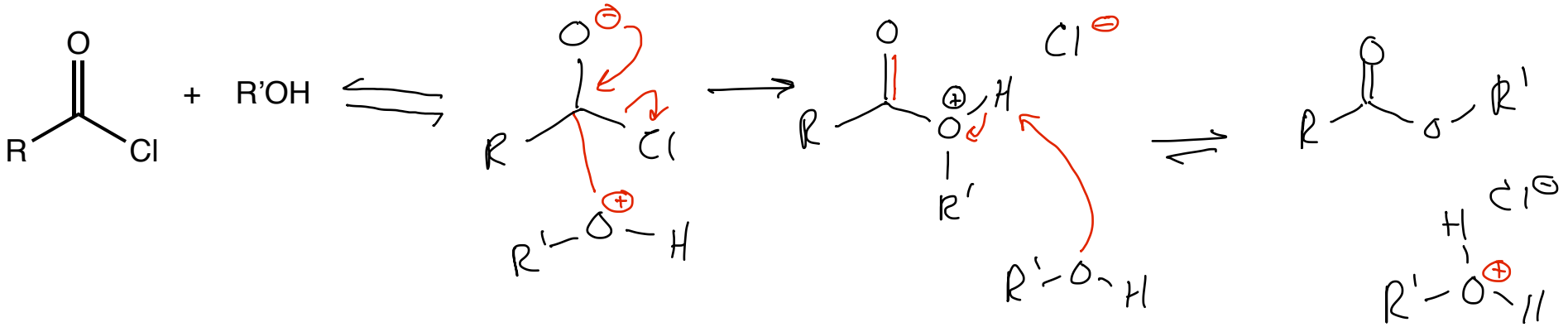
Aldehyde and Ketone Nomenclature
Section 16.1

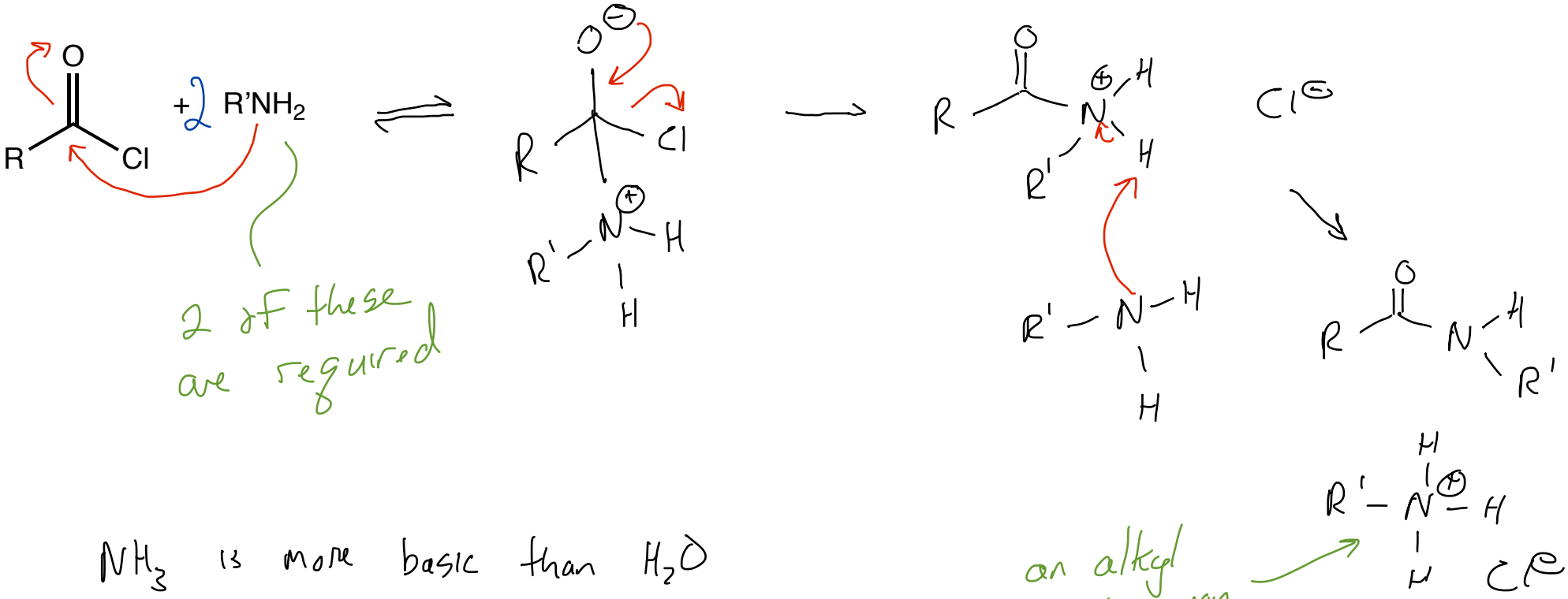
Relative Reactivities
Section 16.2

How Aldehydes and Ketones React
Section 16.3

Reactions with Carbon Nucleophiles
Section 16.4

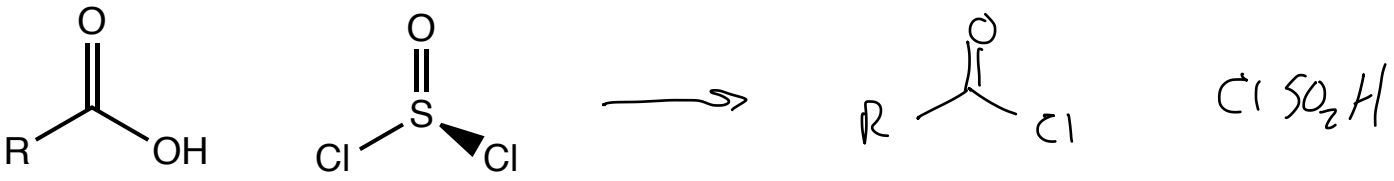

ROH is like a protonated Z⊖ or ZH
+ R'OH
1° amine
CH3-NH2
these have an H+ to lose
CH3-N-H
2° amine
CH3-N-CH3
3° amine
+ R'NH2
need H's otherwise there is no H to lose to make our Z⊖
R'HN H
this H⊕ and this e⁻ rich N are going to be a problem
H⊕ Cl⊖

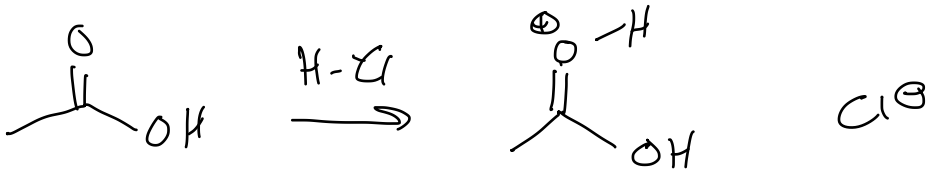


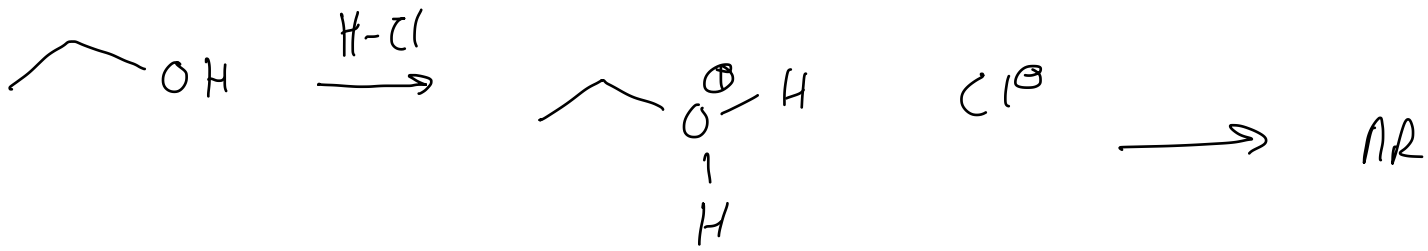


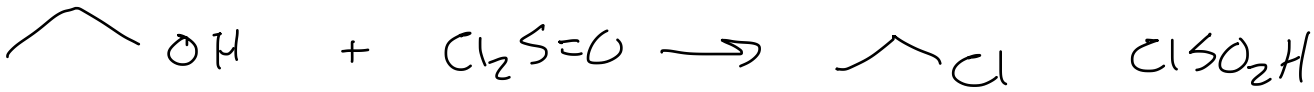
NH_3 is more basic than H_2O

an alkyl ammonium ion

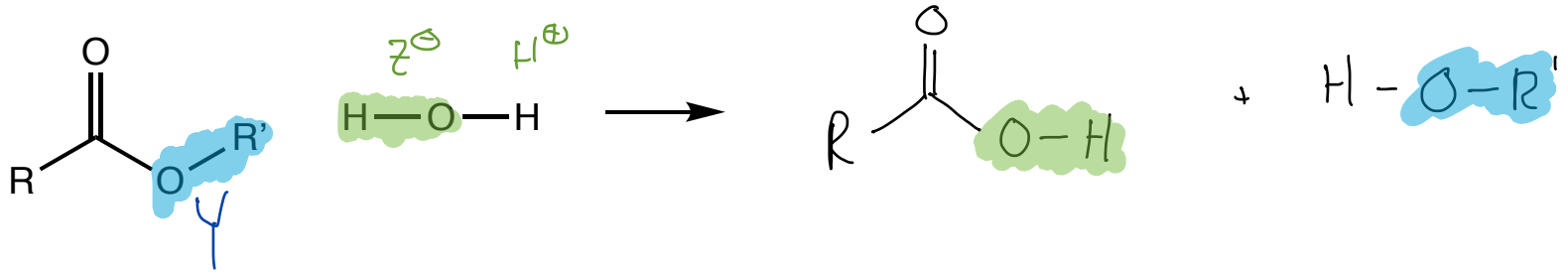

O
R
OH
O
S
Cl
Cl
R
Cl
ClSO2H


O
OH
H-Cl
H
O
OH
ClΘ

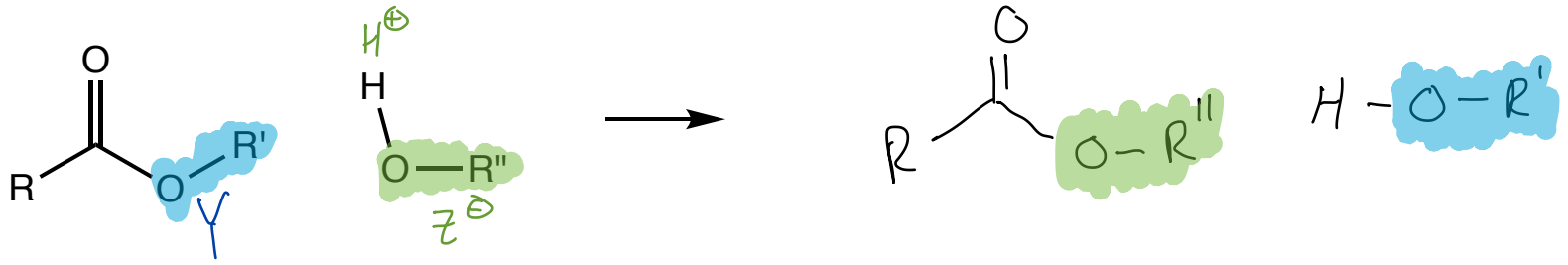

OH
H-Cl
H
O
1
H
ClΘ
NR


OH
+
Cl2S=O
Cl
ClSO2H

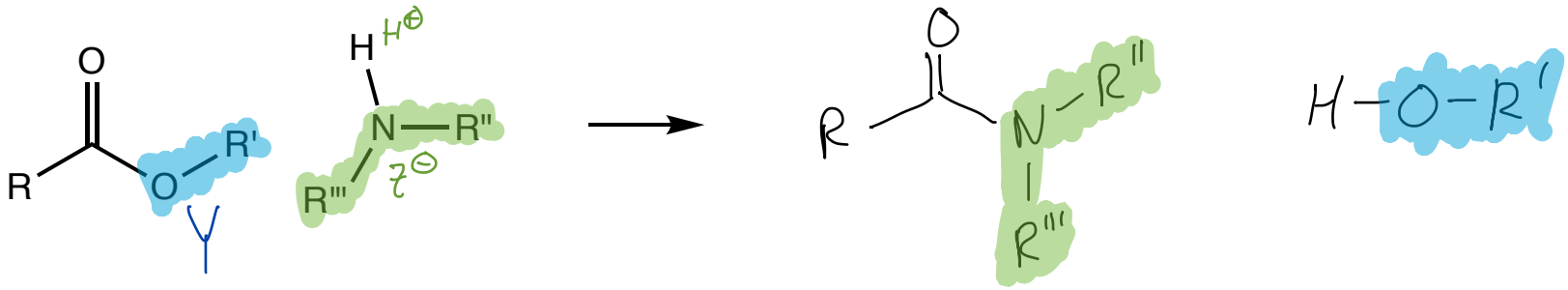
Hydrolysis – uses water to break the C to Y bond

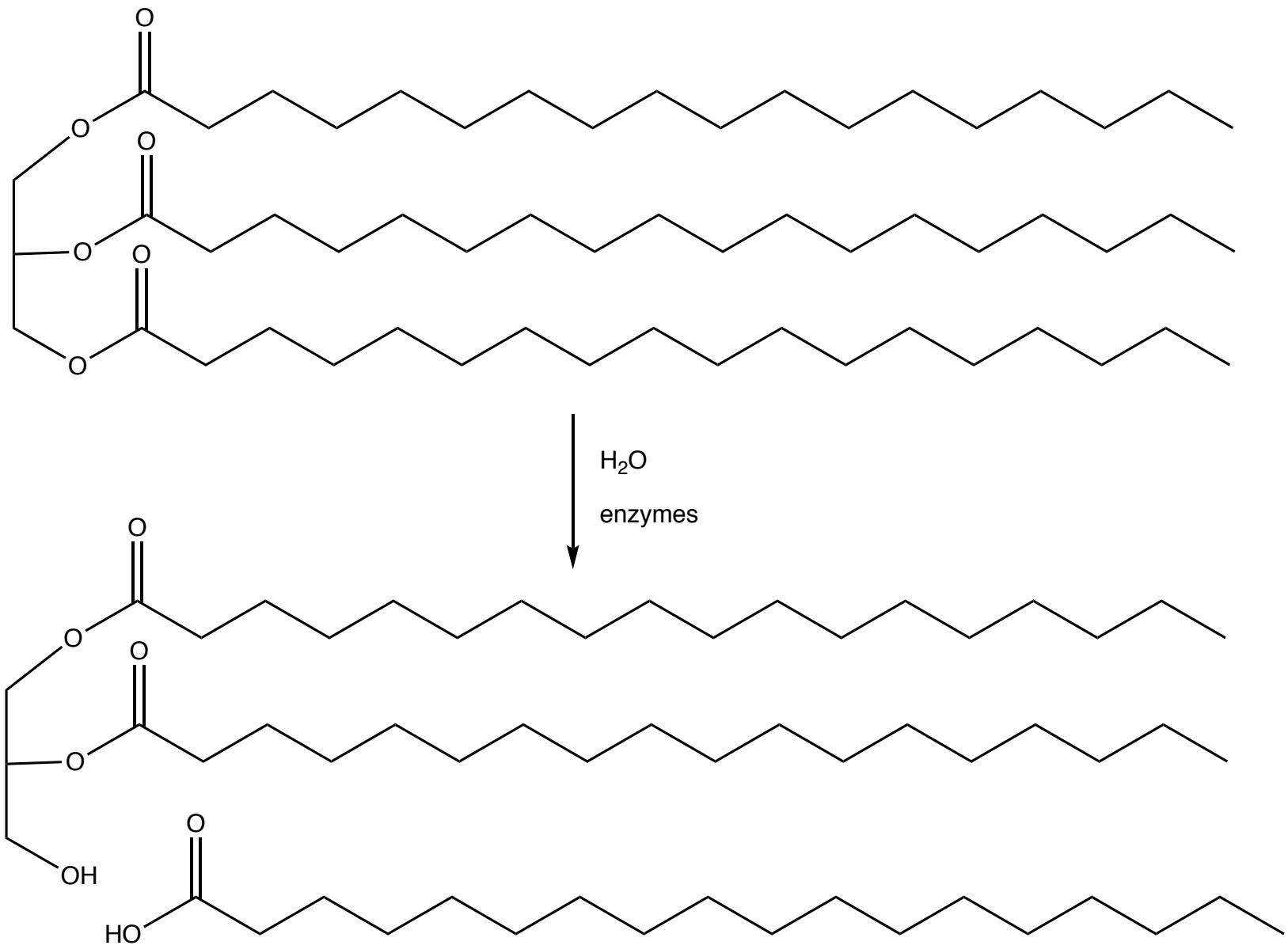


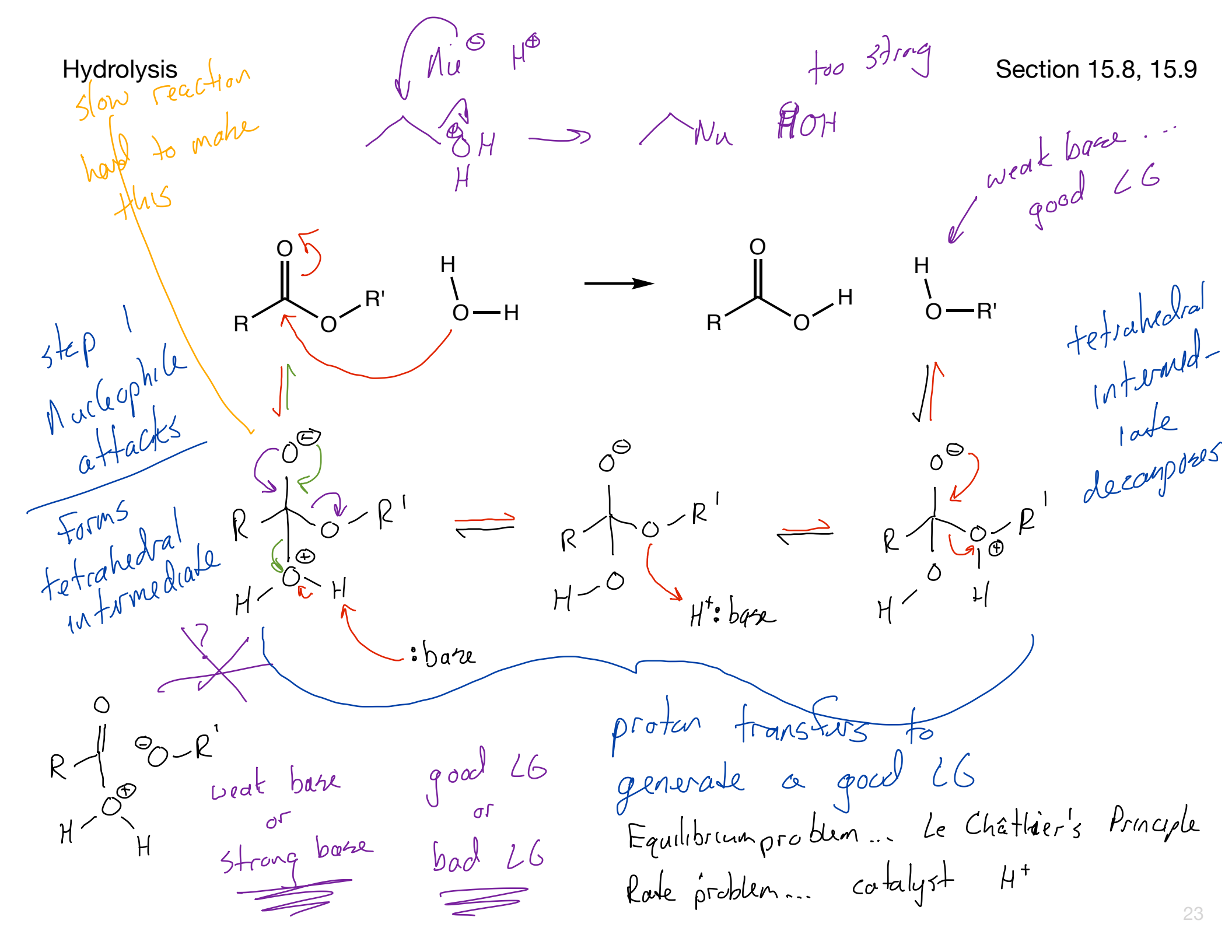
Transesterification



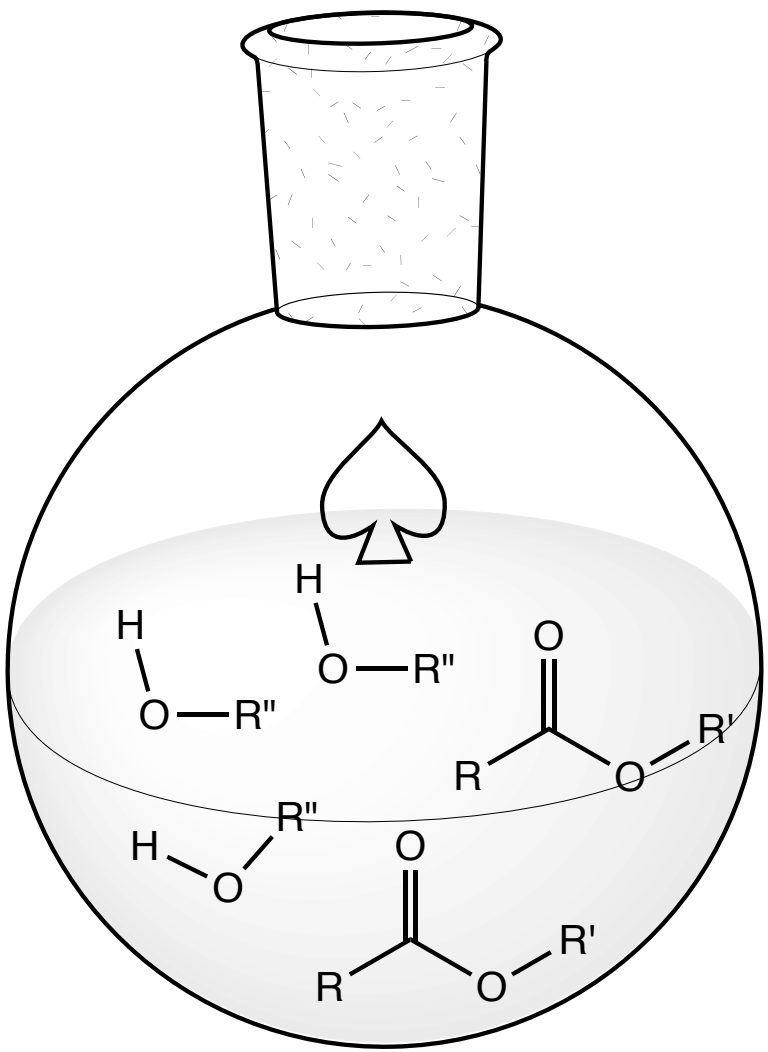
Aminolysis



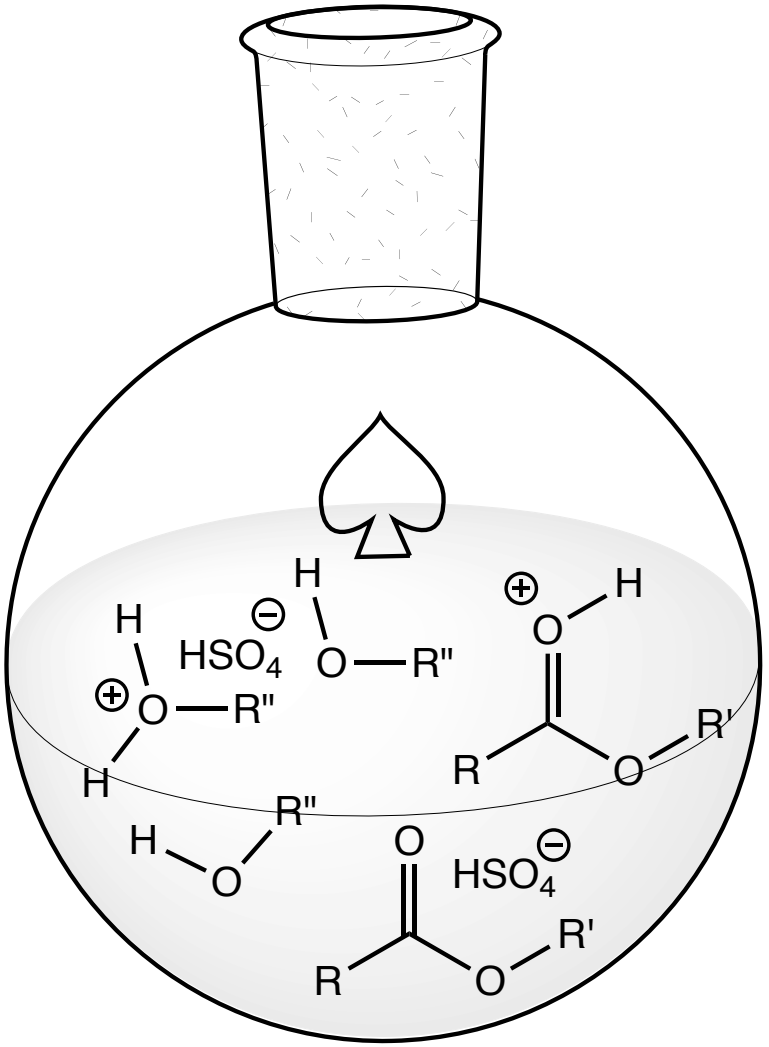

O
O
O
O
O
O
H_2O
enzymes
O
O
O
O
OH
HO


slow reaction
hard to make this
too strong
weak base ... good LG
step 1
Nucleophile attacks
Forms tetrahedral intermediate
tetrahedral intermediate decomposes
:base
weak base or strong base
good LG or bad LG
proton transfers to generate a good LG
Equilibrium problem ... Le Châtelier's Principle
Rate problem ... catalyst H+

A Reminder About Strong Acids



$+ H_2SO_4$



H-Cl / not nucleophilic enough to be a problem

or H_2SO_4 catalyst

HSO_4^- not nucleophilic

~~HNO_3~~

: base = R"-O-H, RC(O)OR'

less likely HSO_4^-

Hydrolysis - Acid Catalyzed Mechanism

Section 15.8