

Figure 15.01

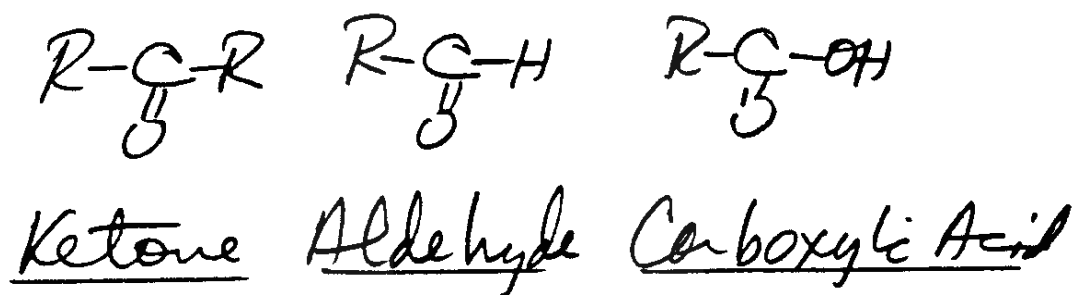


Figure 15.02

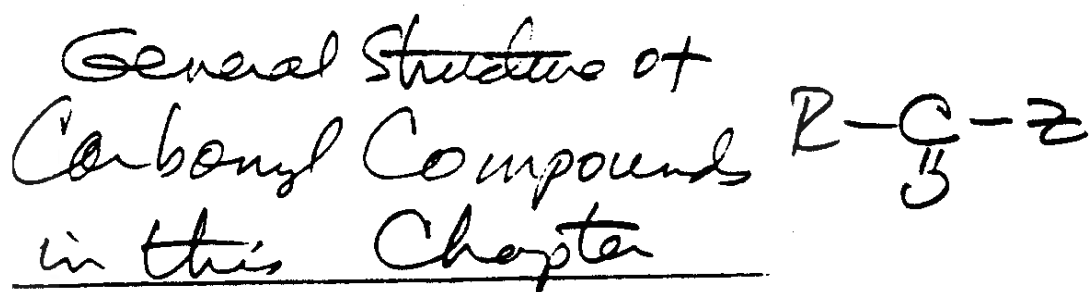


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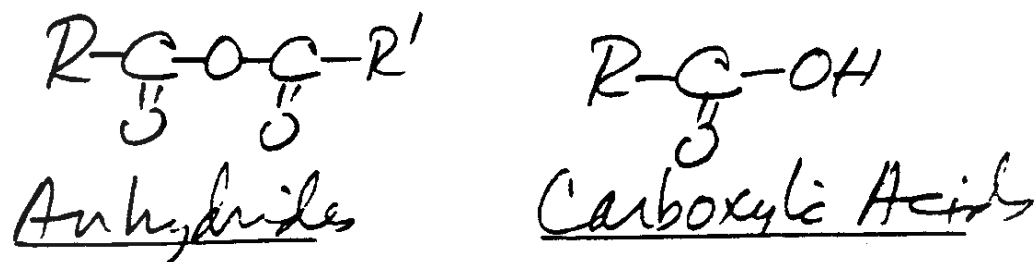
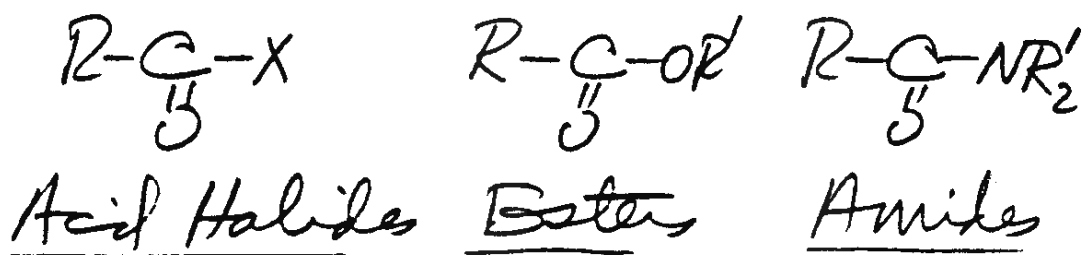


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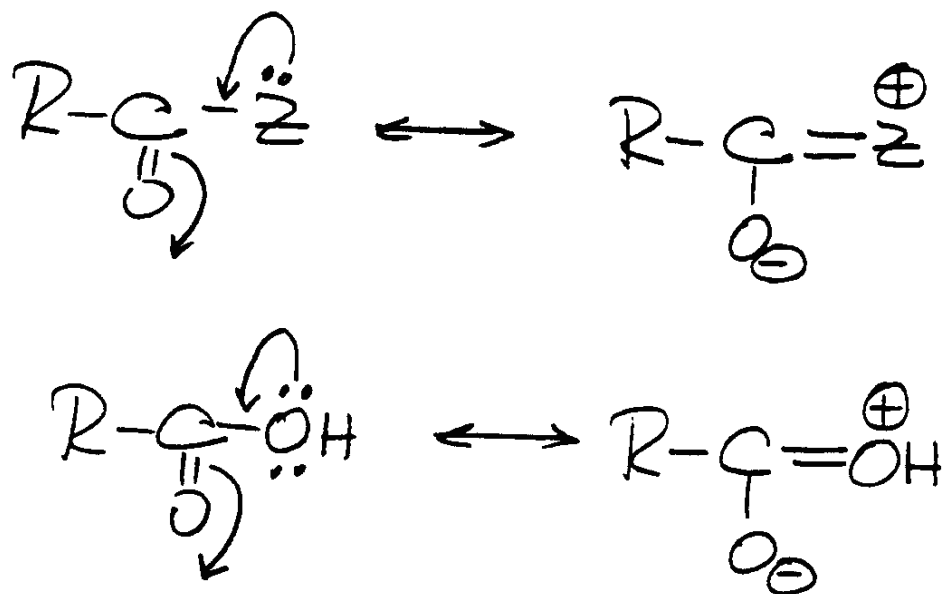


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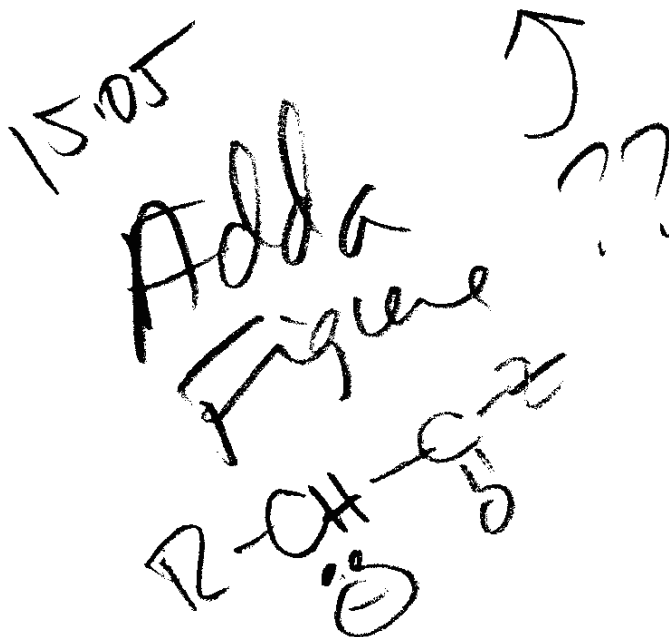


Figure 15.06

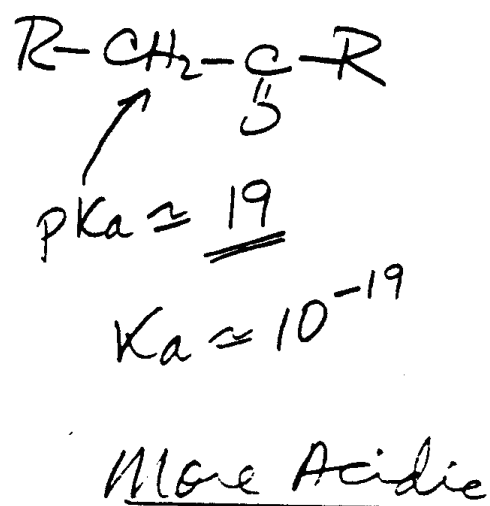
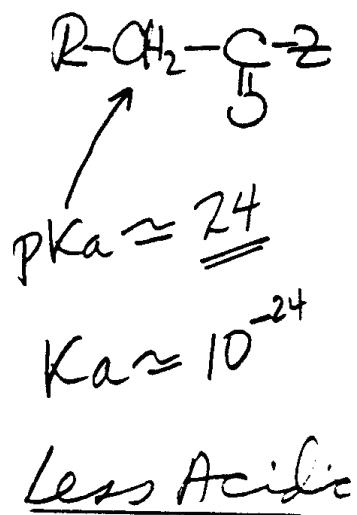


Figure 15.07



Figure 15.08

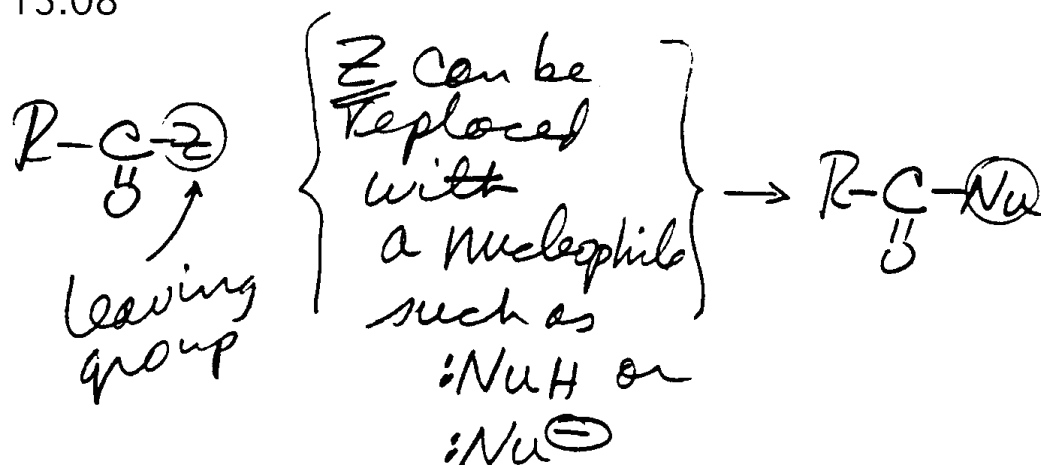


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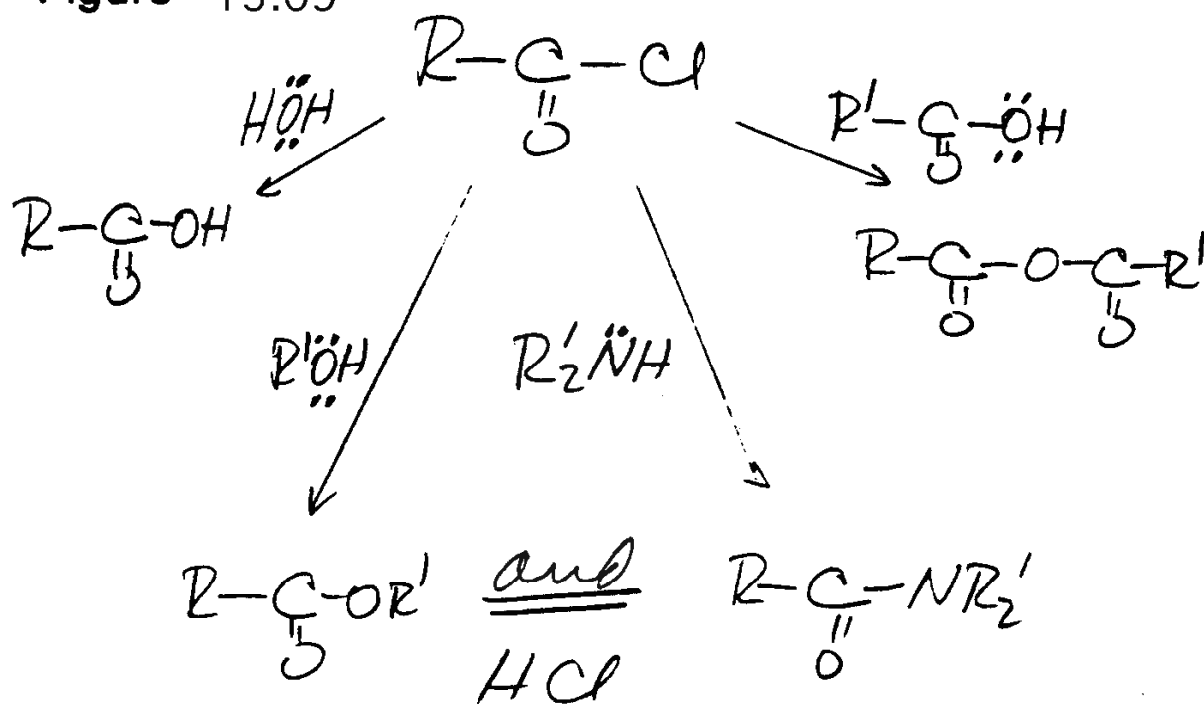


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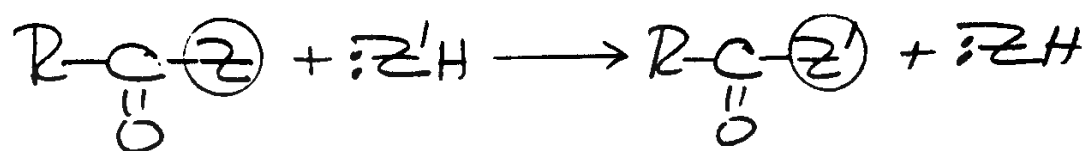


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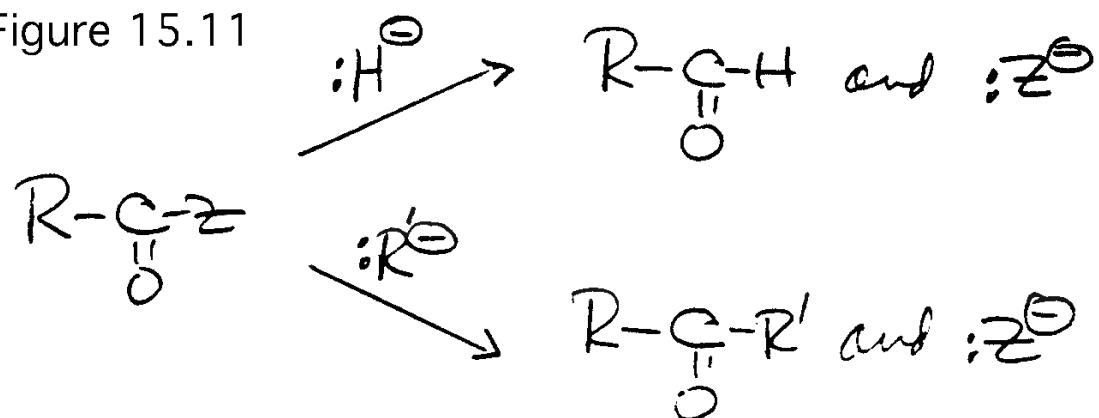
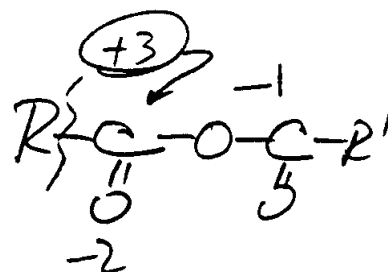
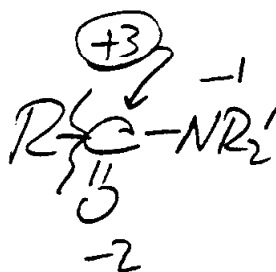
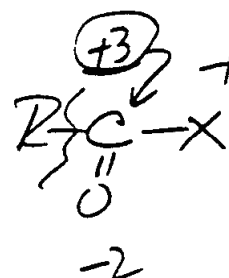
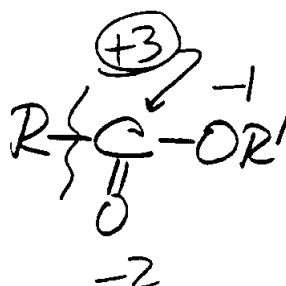
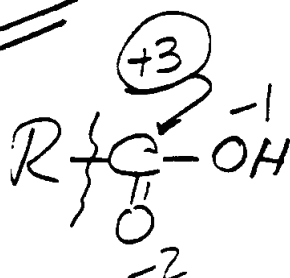
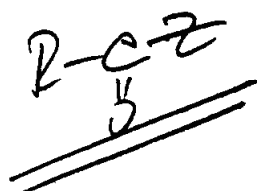
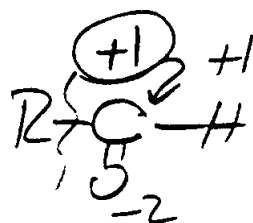


Figure 15.12

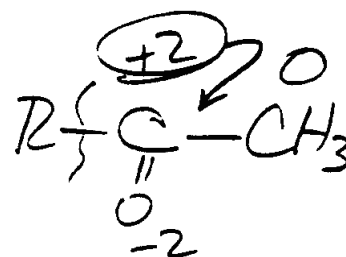
A Comparison of Oxidation Numbers for C in C=O for Different Carbonyl Compounds



Compare
to:



Aldehyde



Ketone

Figure 15.13

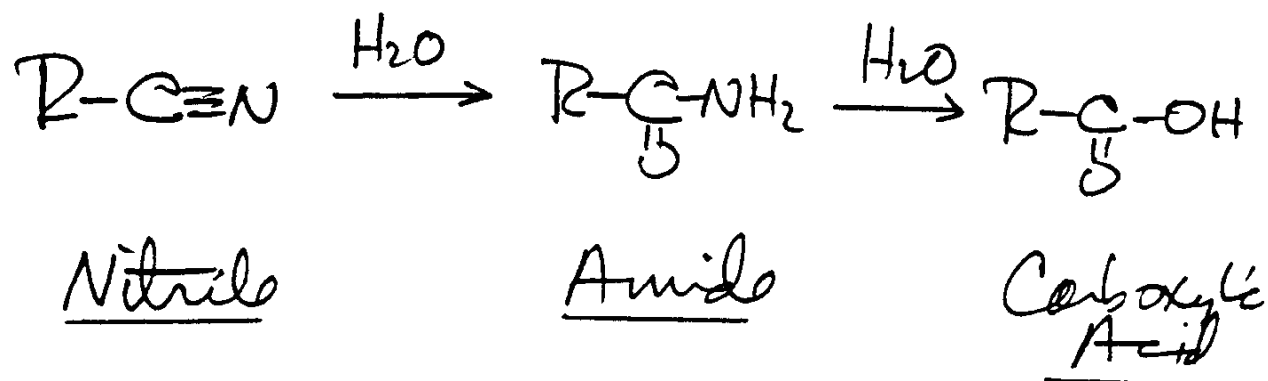
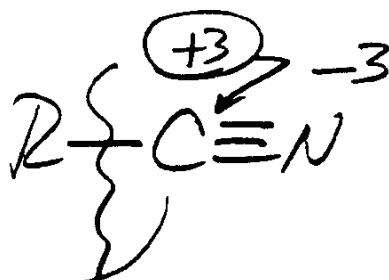


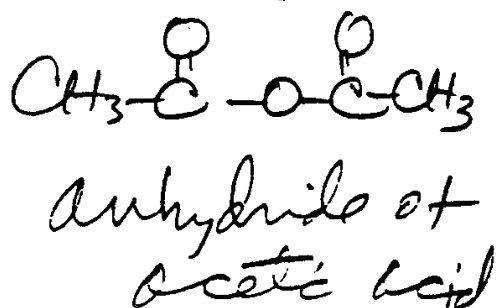
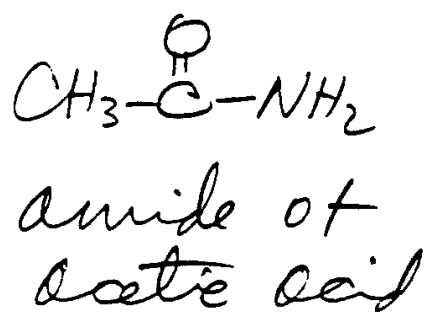
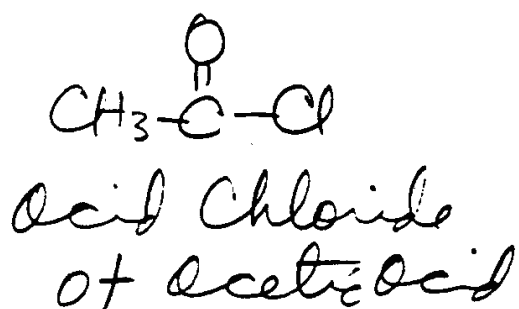
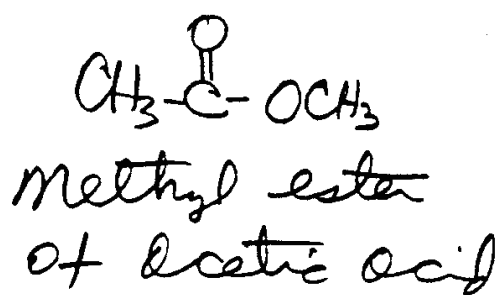
Figure 15.14

Oxidation Number
for C in $C \equiv N$



Same Oxidation Number as
for C of $C=O$ in $R-\underset{\text{O}}{\underset{||}{C}}-Z$.

Figure 15.15



H₂O

H₂O

H₂O

H₂O

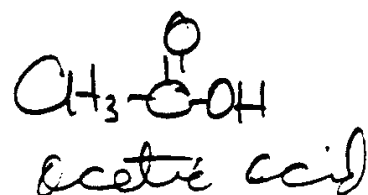


Figure 15.16

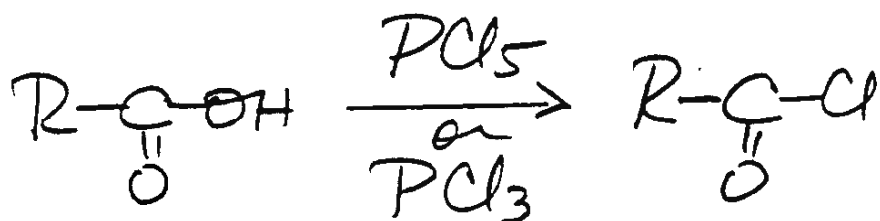
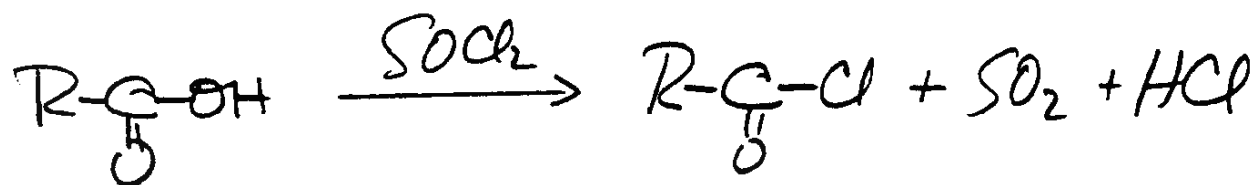


Figure 15.17

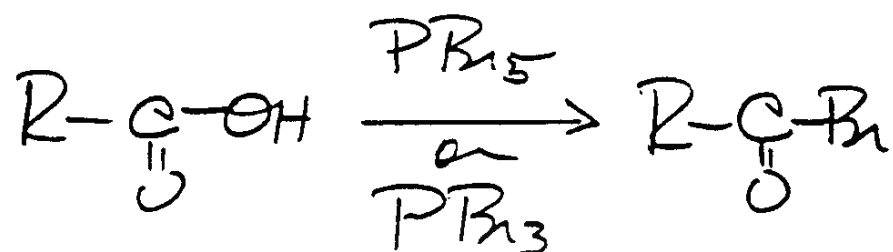


Figure 15.18

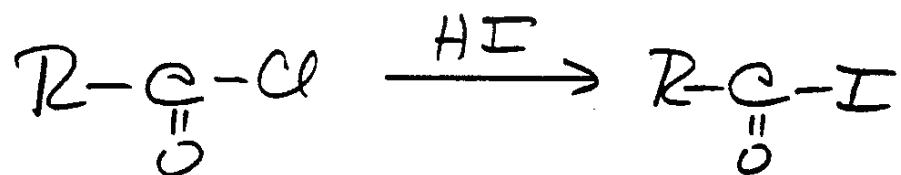
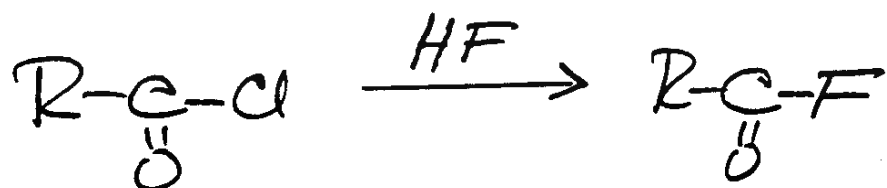


Figure 15.19

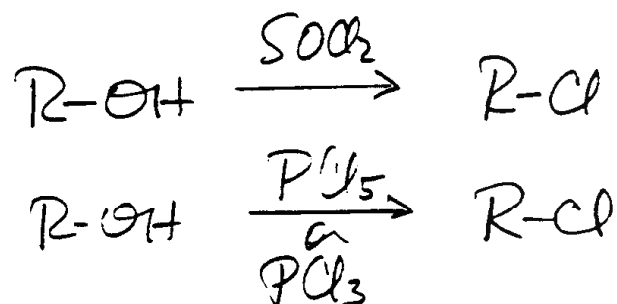


Figure 15.20

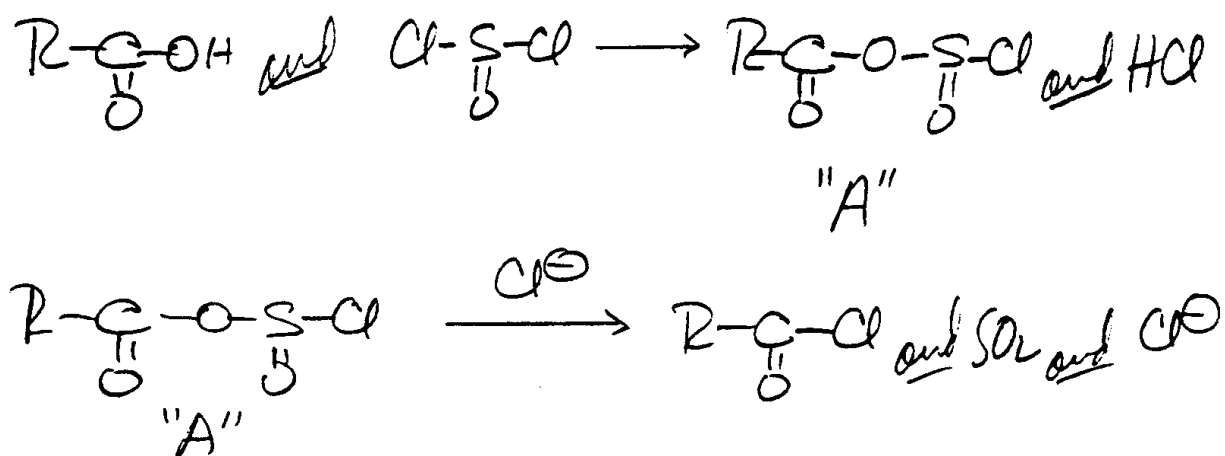


Figure 15.21

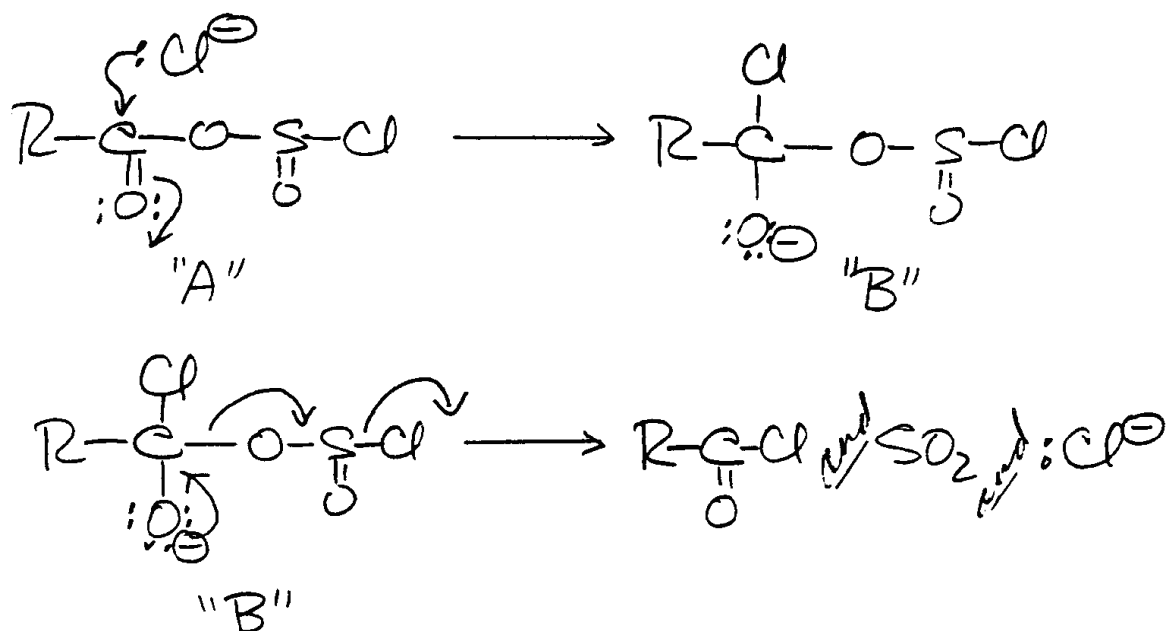


Figure 15.22

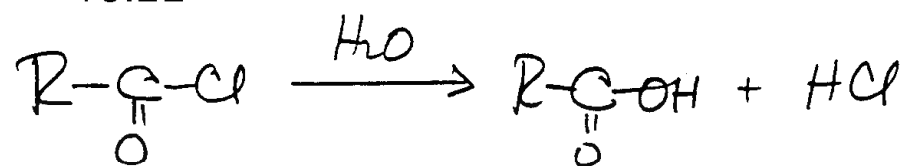
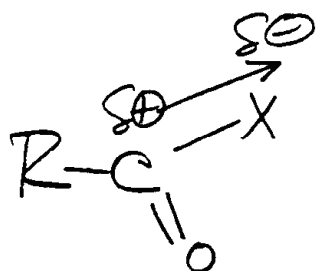


Figure 15.23



Electronegative X withdraws electron density from C of C=O.

Figure 15.24

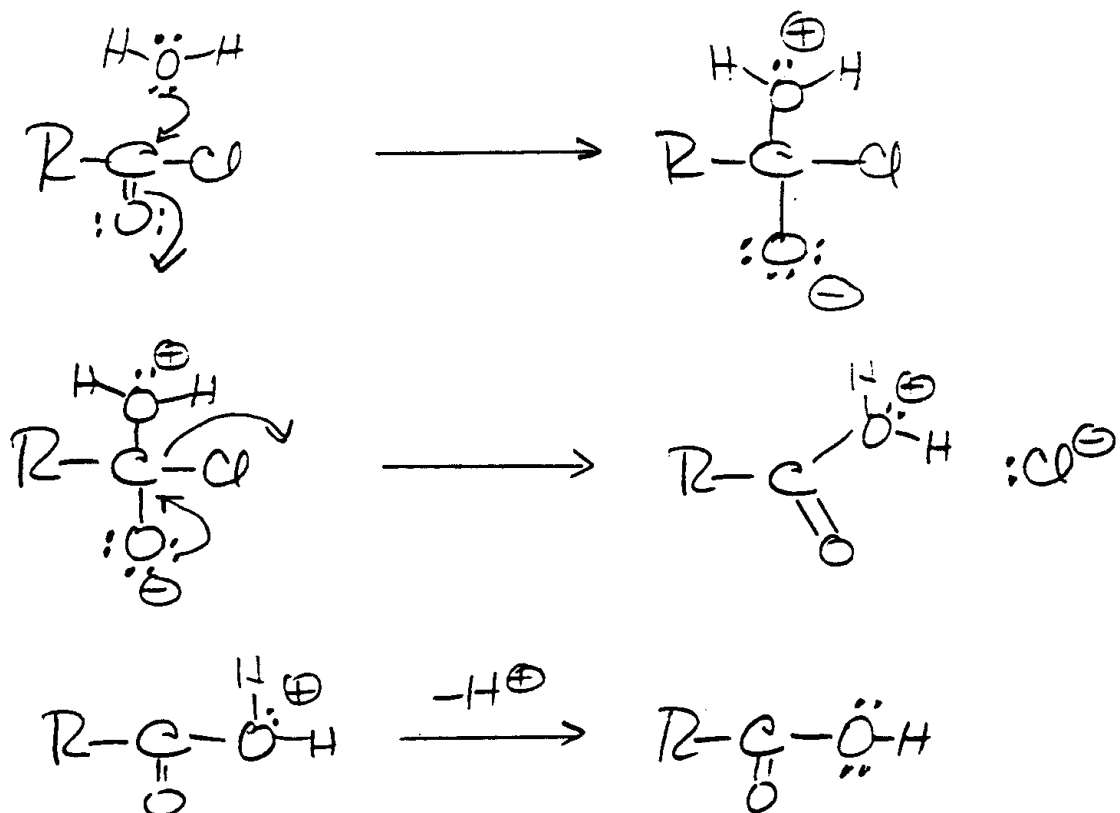


Figure 15.25

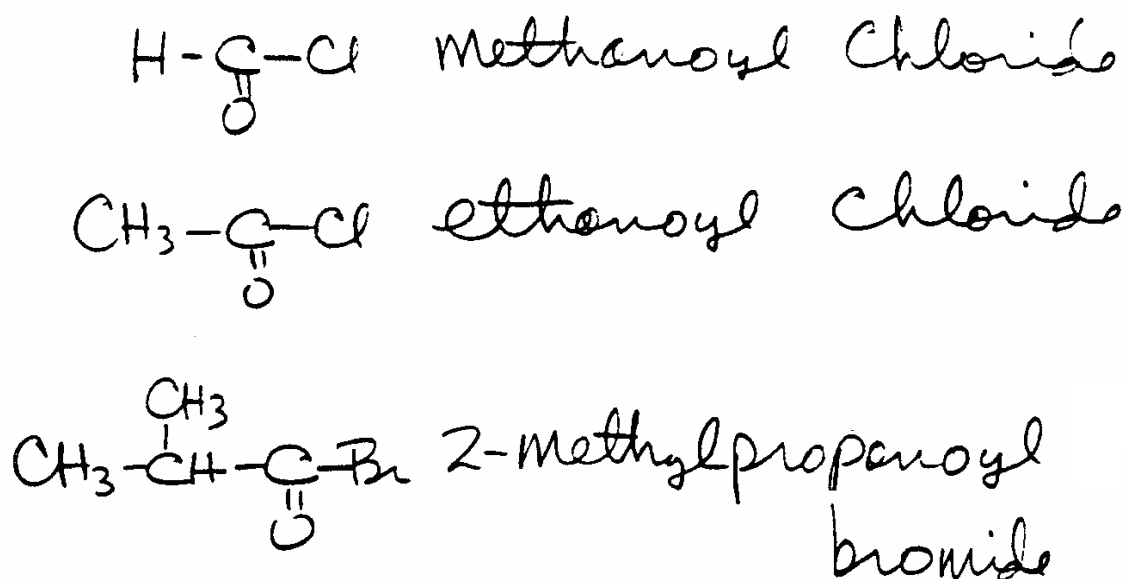


Figure 15.26

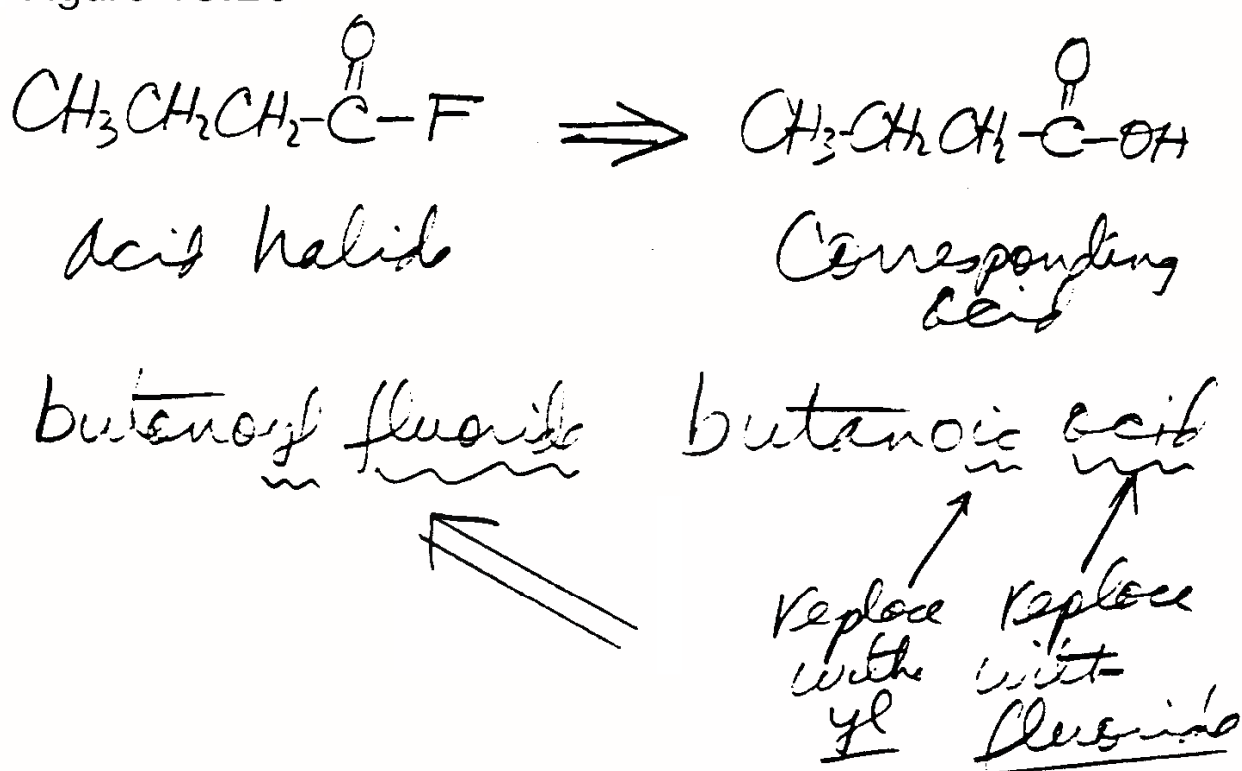


Figure 15.27

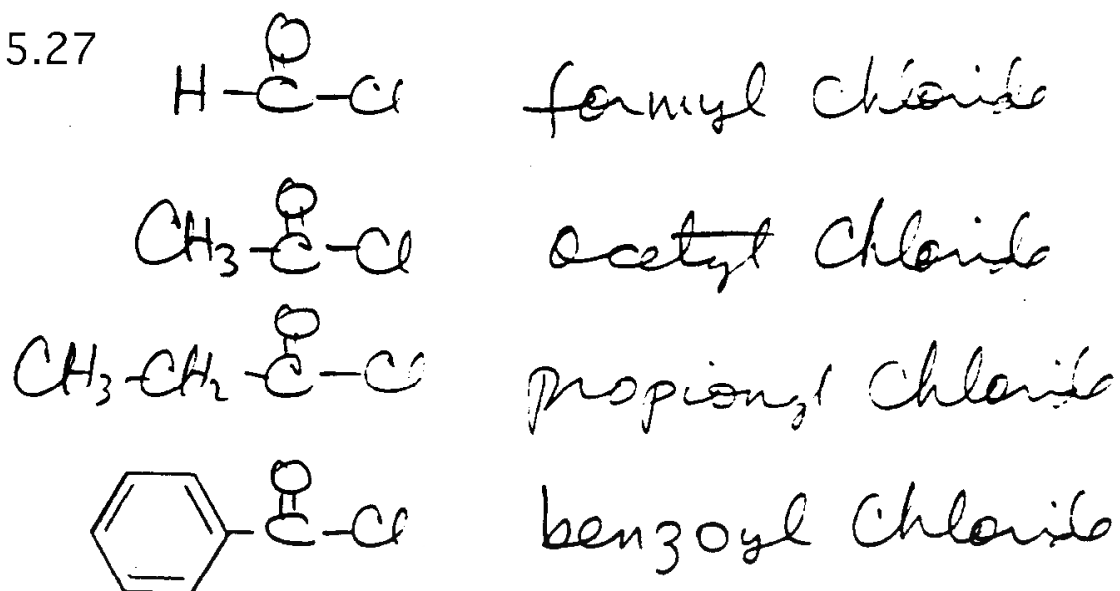


Figure 15.28

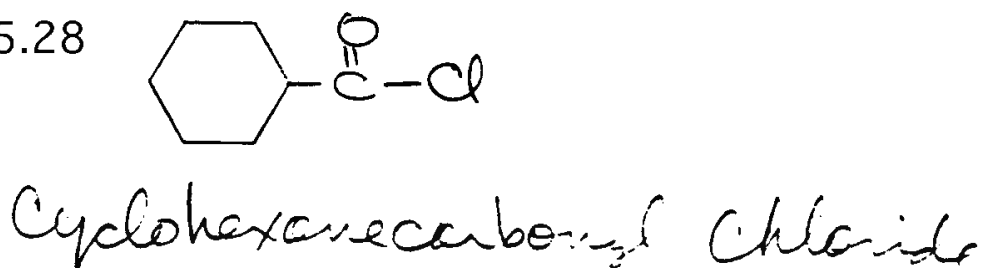


Figure 15.29

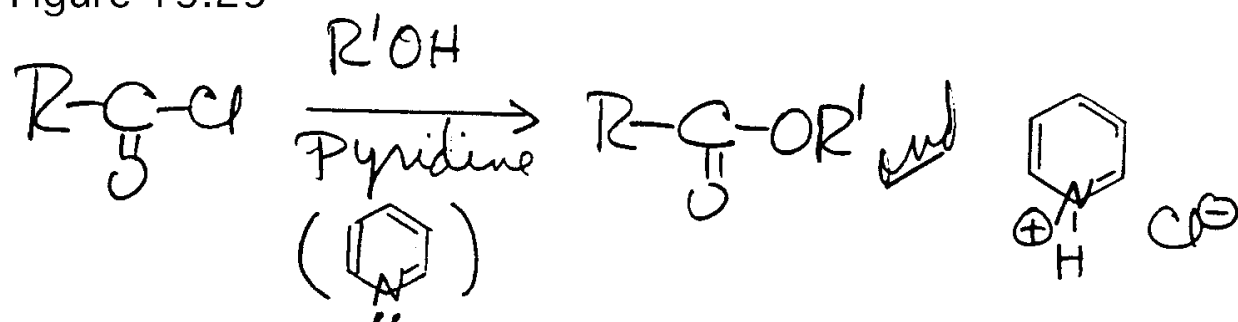


Figure 15.30 See Text

Figure 15.31 How to Name Esters

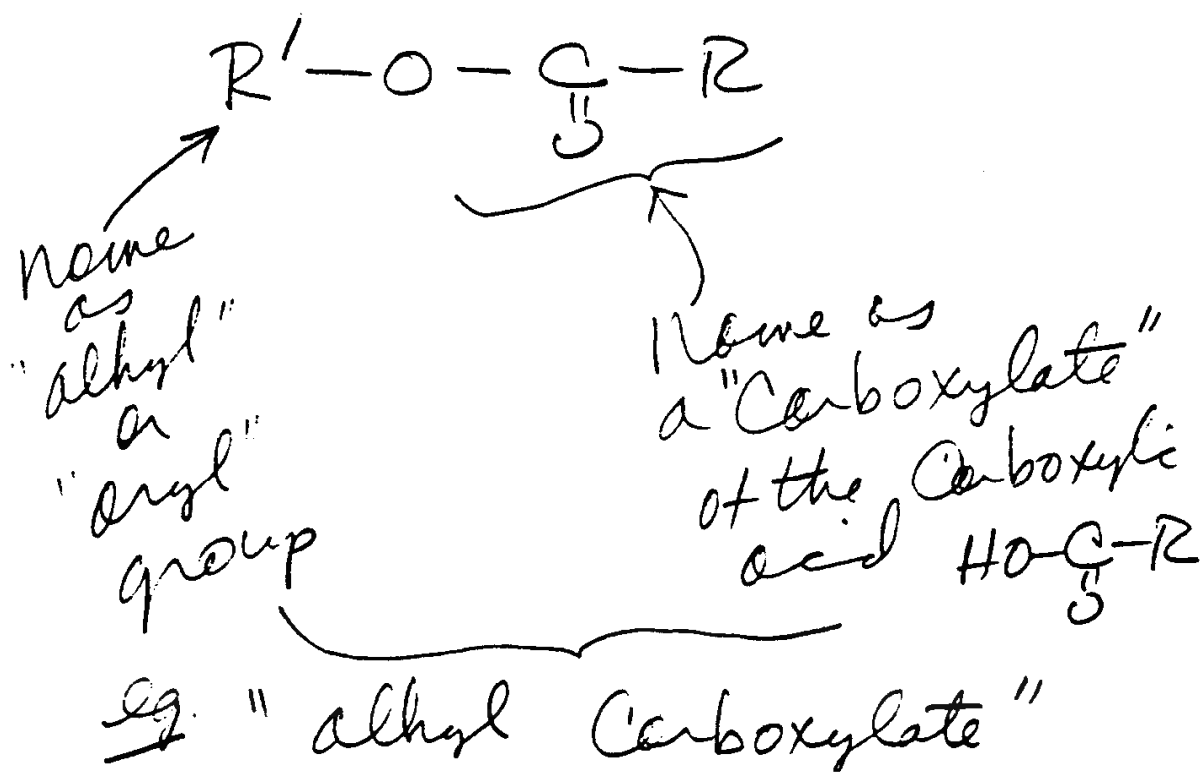


Figure 15.32

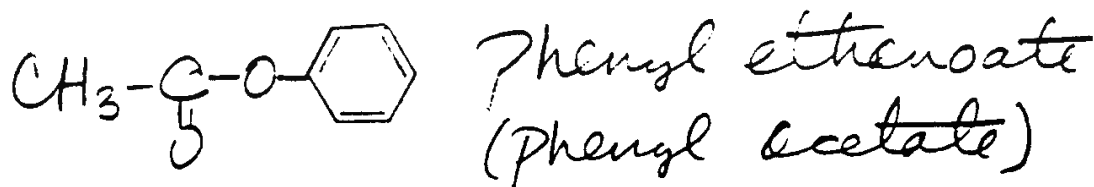
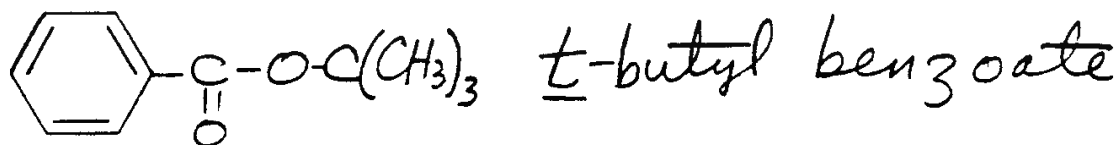
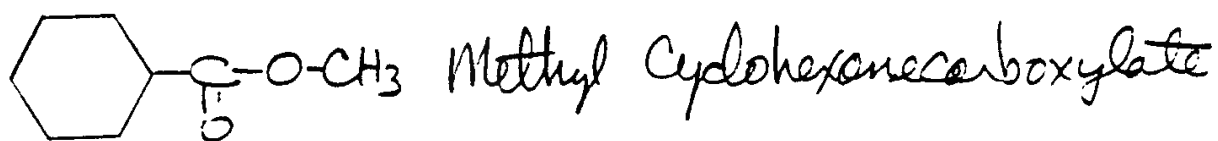
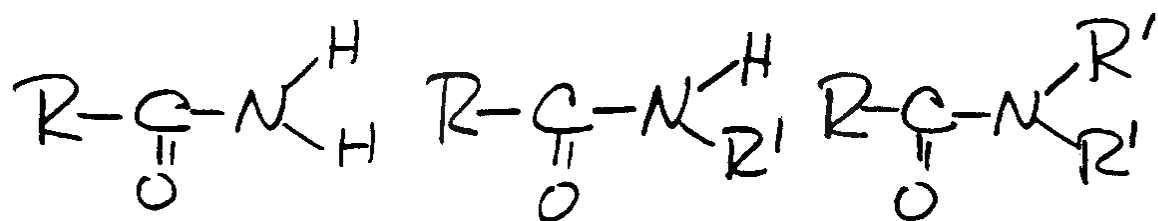


Figure 15.33 Possible Structure of Amides



R' Can be various alkyl or aryl groups

Figure 15.34

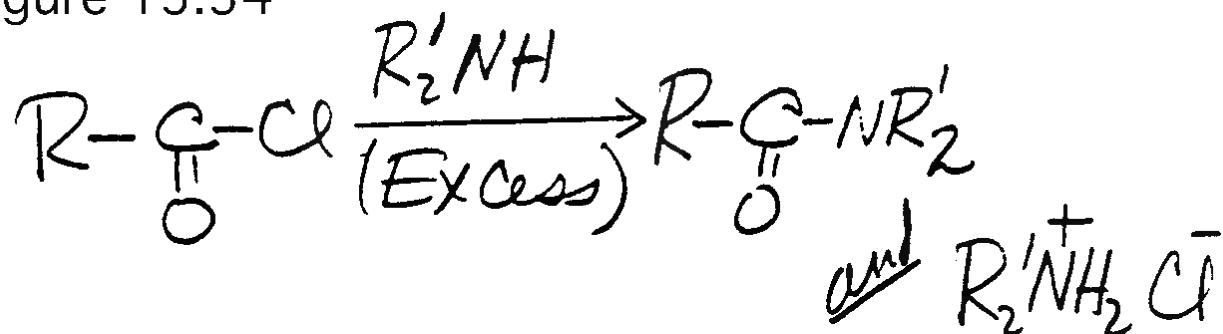


Figure 15.35

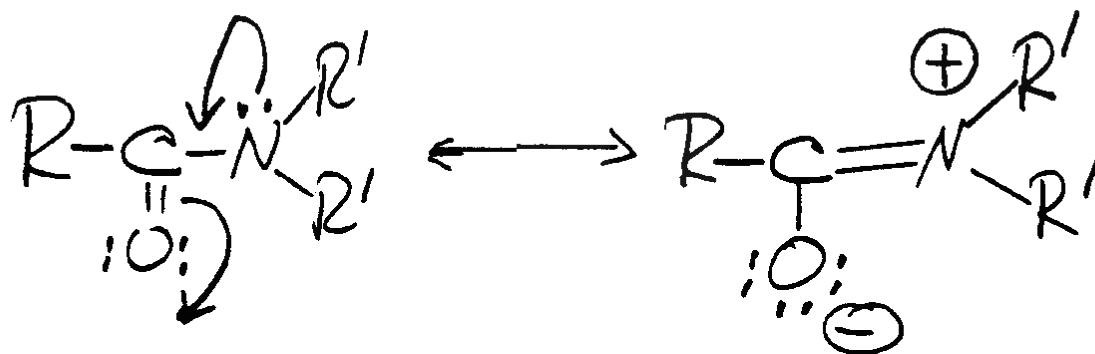


Figure 15.36

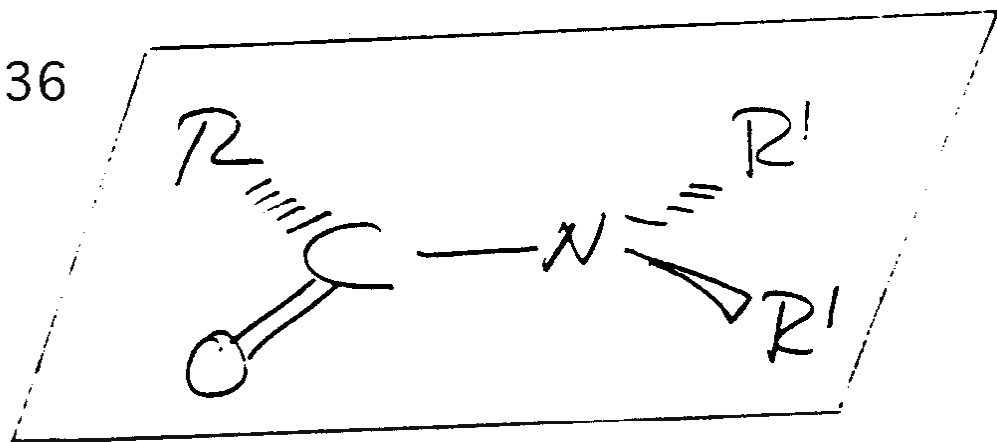


Figure 15.37

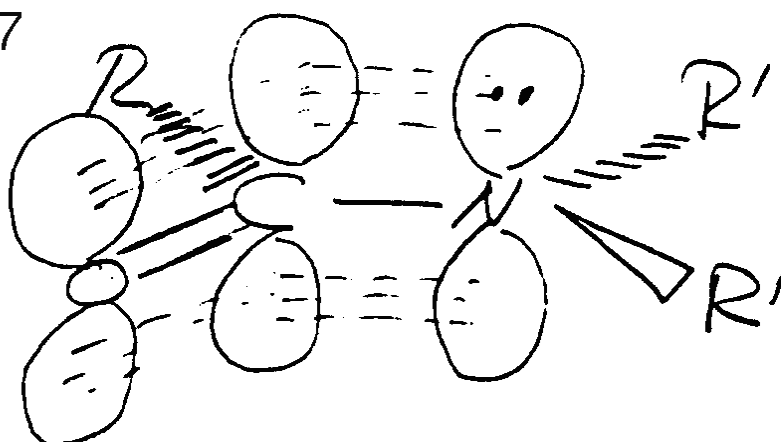


Figure 15.38

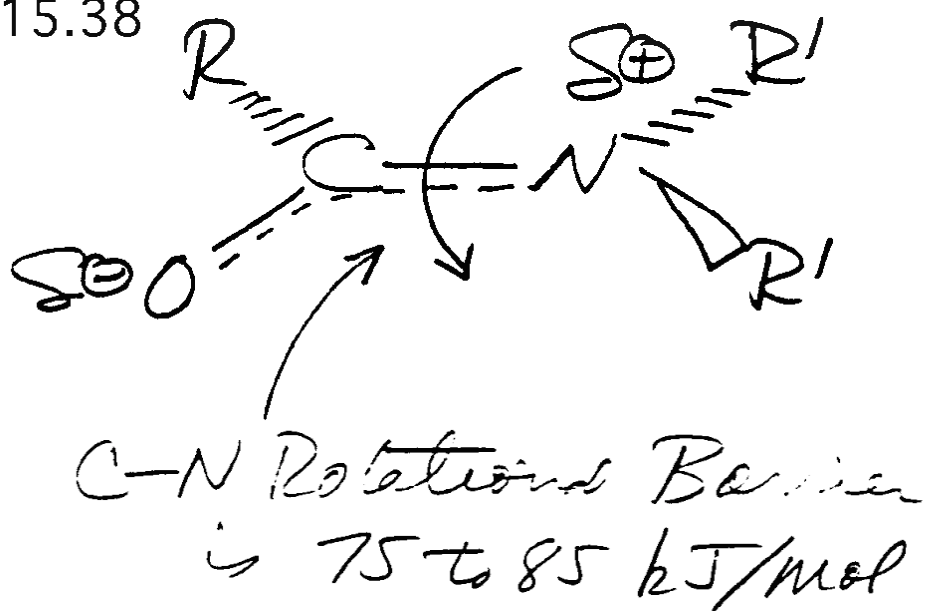


Figure 15.39

Amide Geometric Isomers

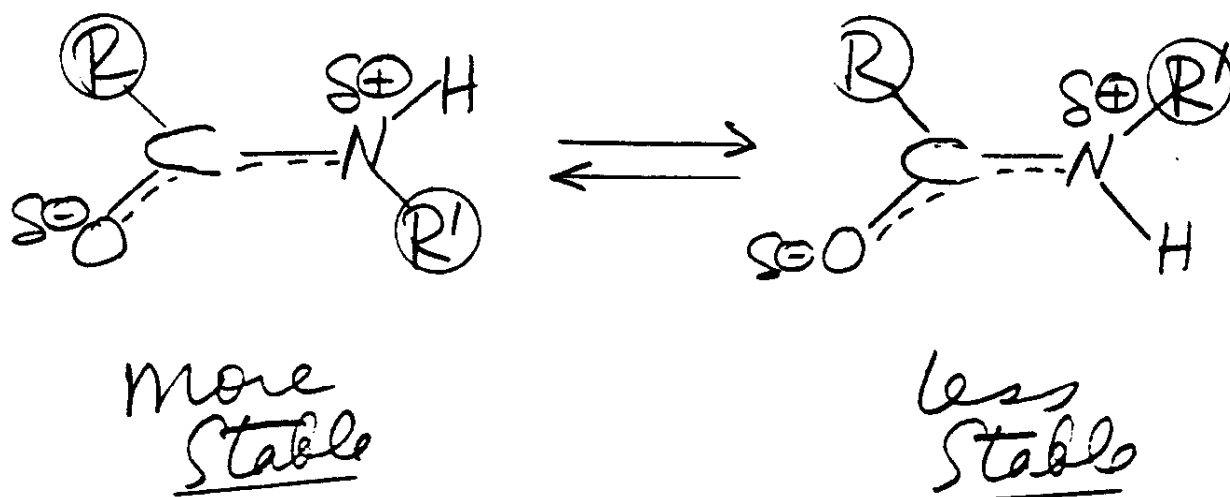
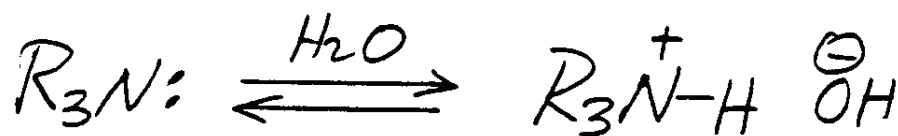


Figure 15.40

Amines are basic:



Amides are not:

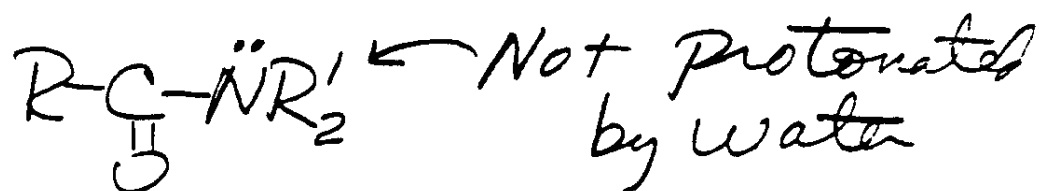


Figure 15.41

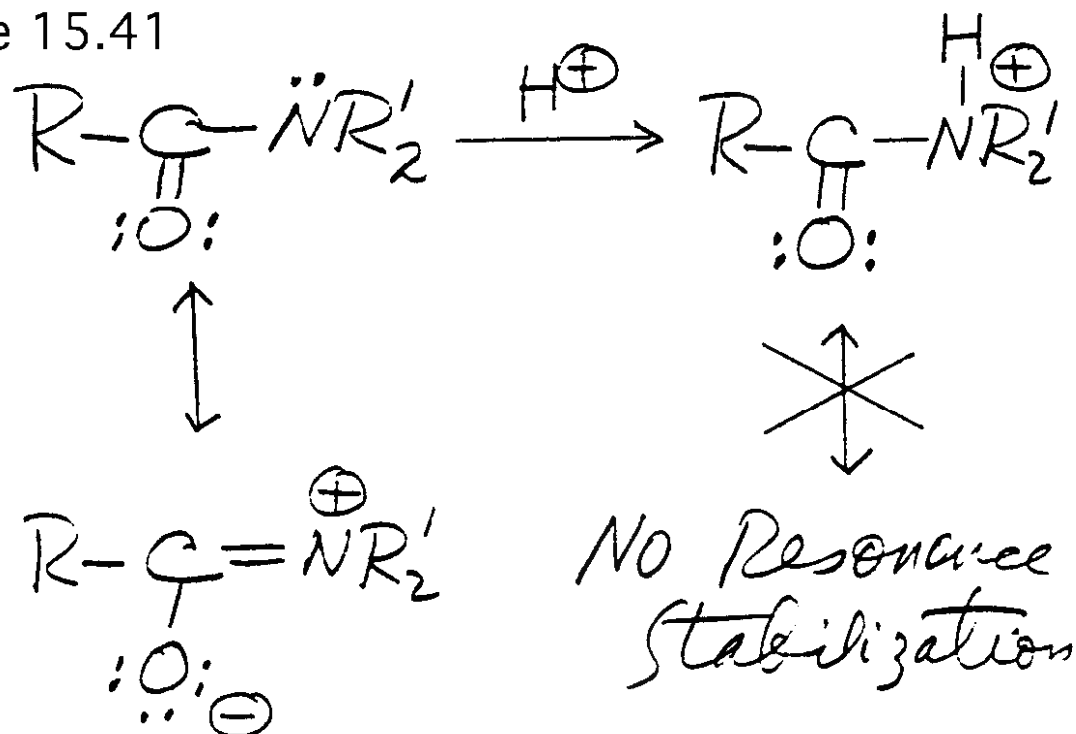


Figure 15.42

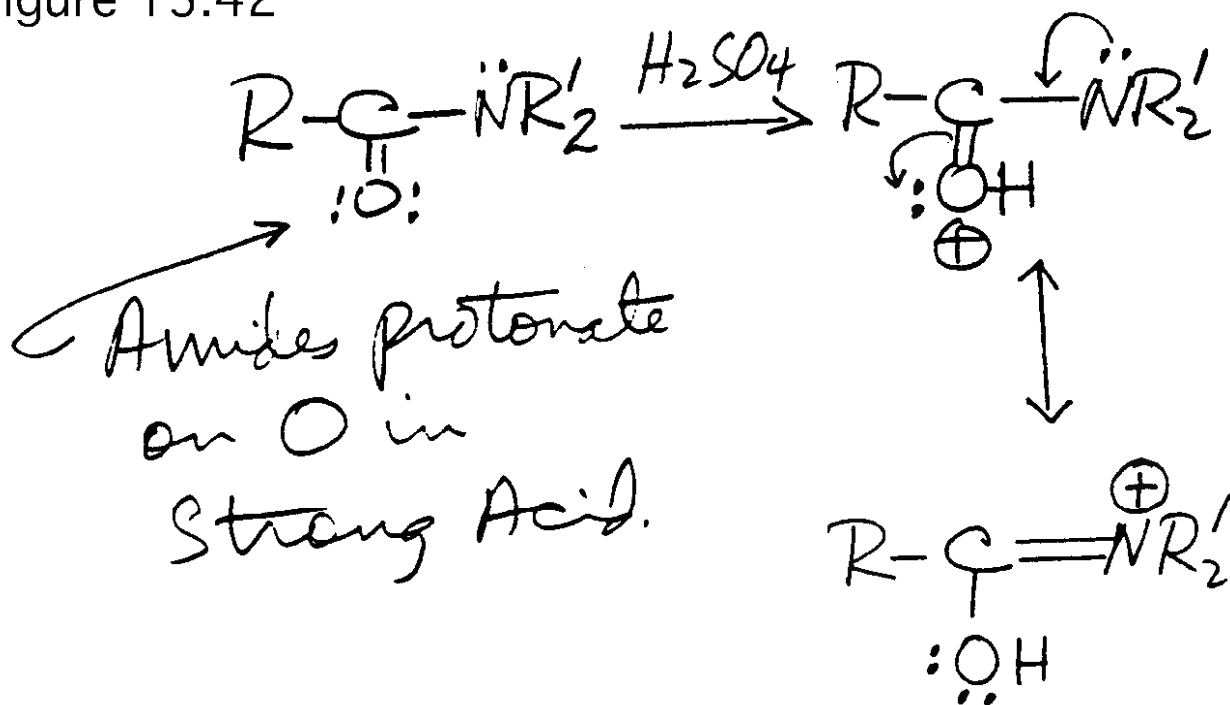


Figure 15.43

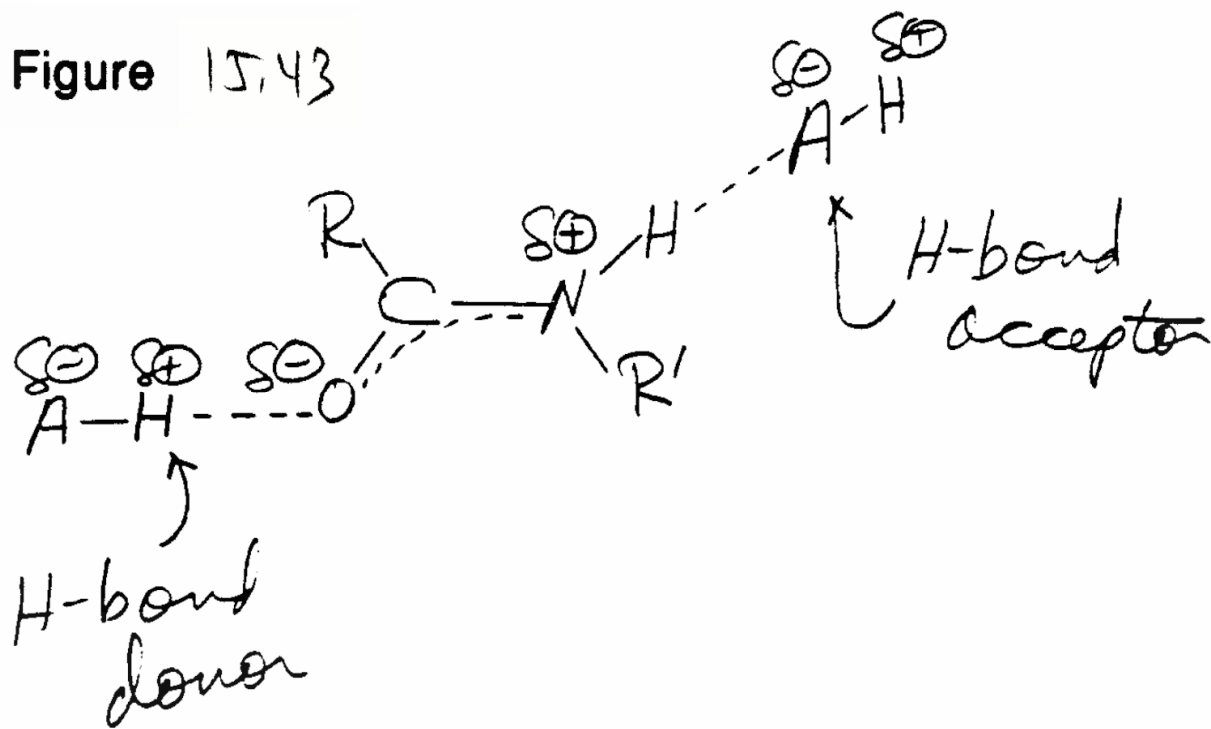


Figure 15.44

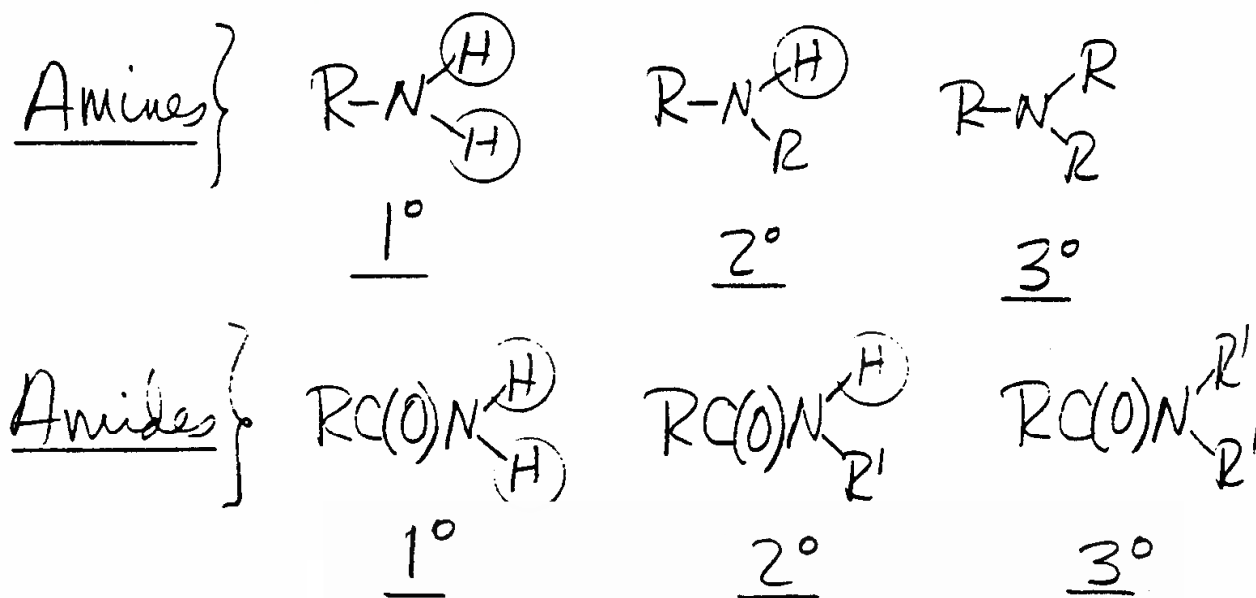
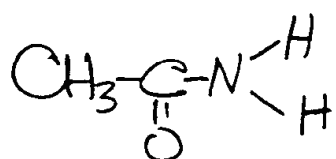
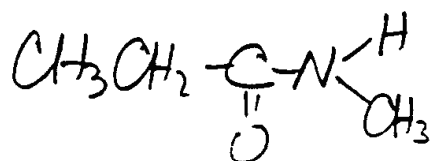


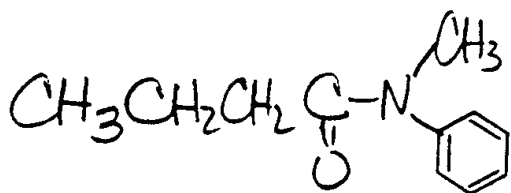
Figure 15.45



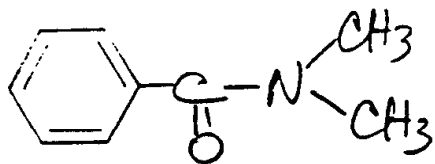
ethanamide
(acetamide)



N-methylpropanamide
(N-methylpropionamide)



N-methyl-N-phenylbutanamide
(N-methyl-N-phenylbutyramide)



N,N-dimethylbenzamide

Figure 15.46

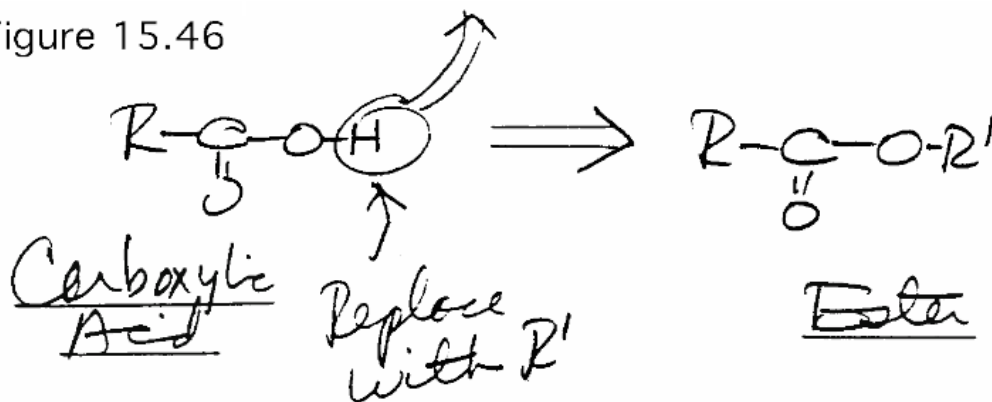


Figure 15.47

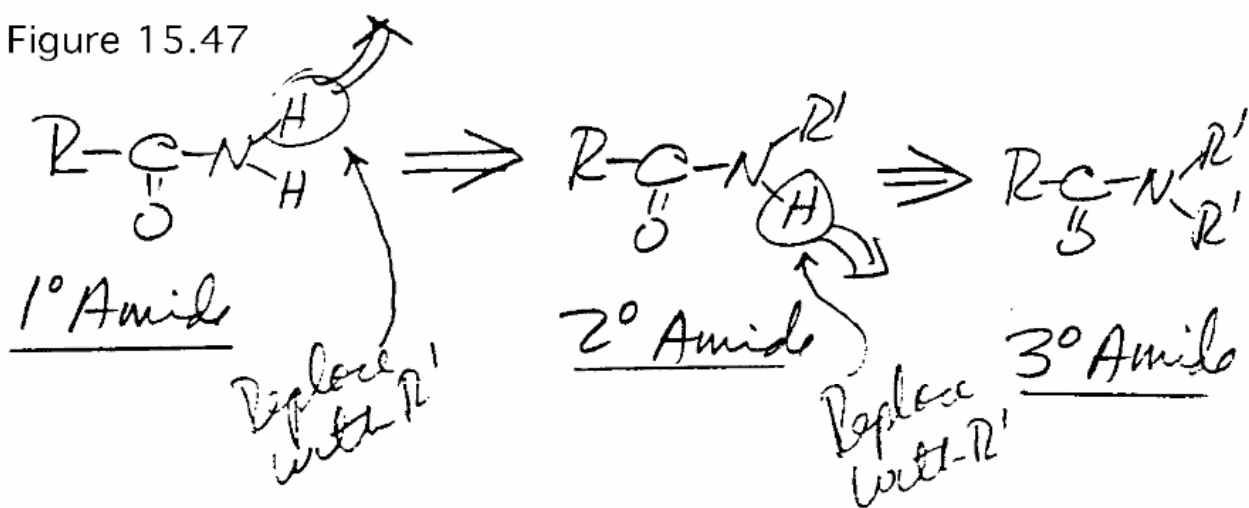


Figure 15.48

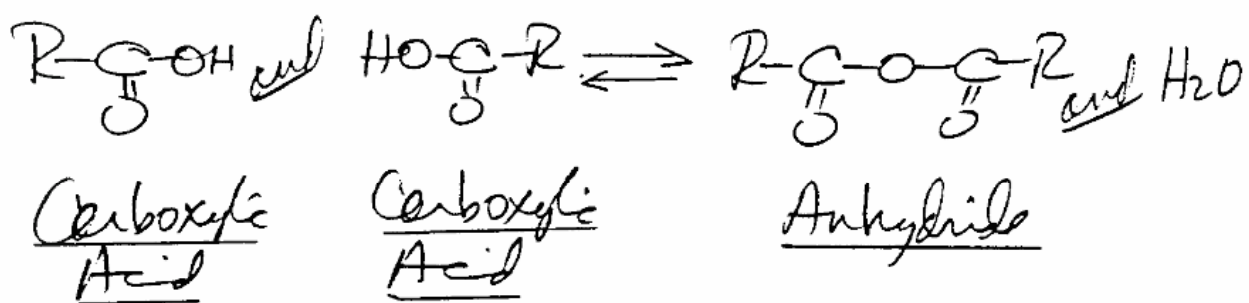


Figure 15.49

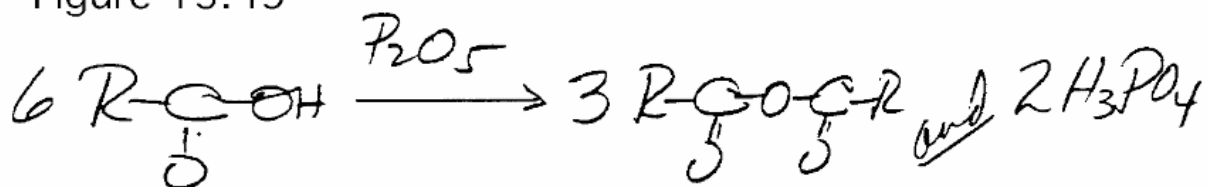


Figure 15.50

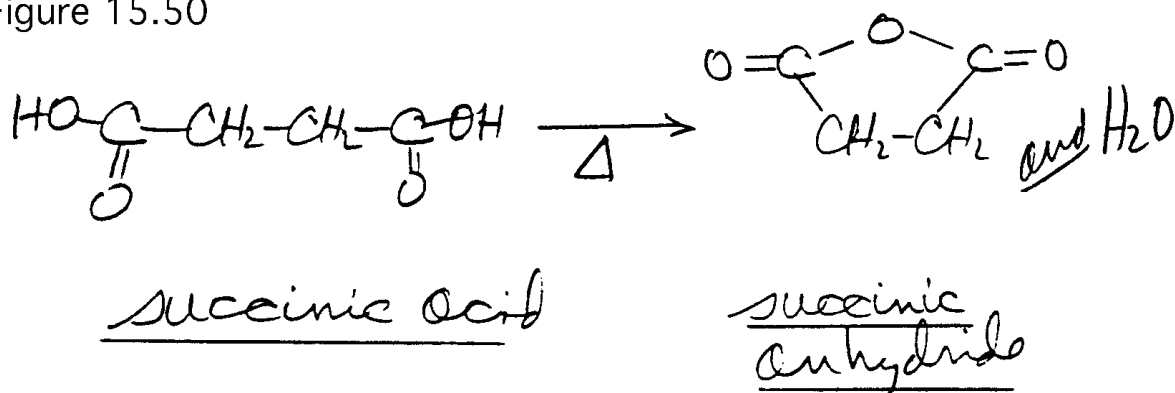


Figure 15.51

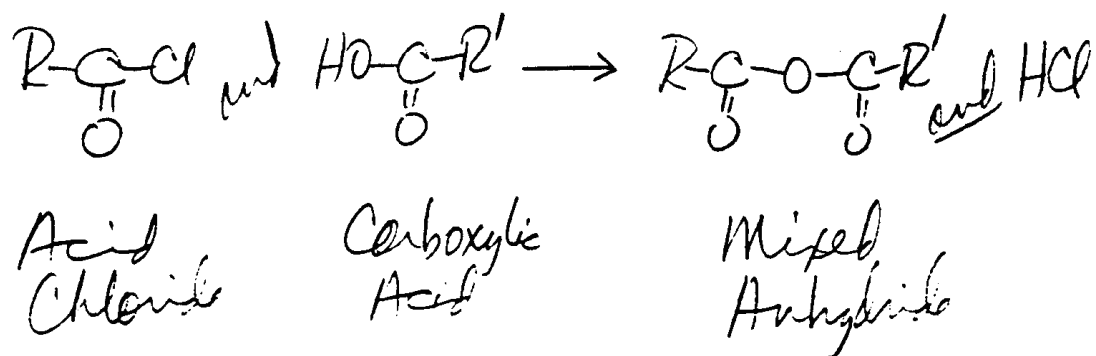


Figure 15.52

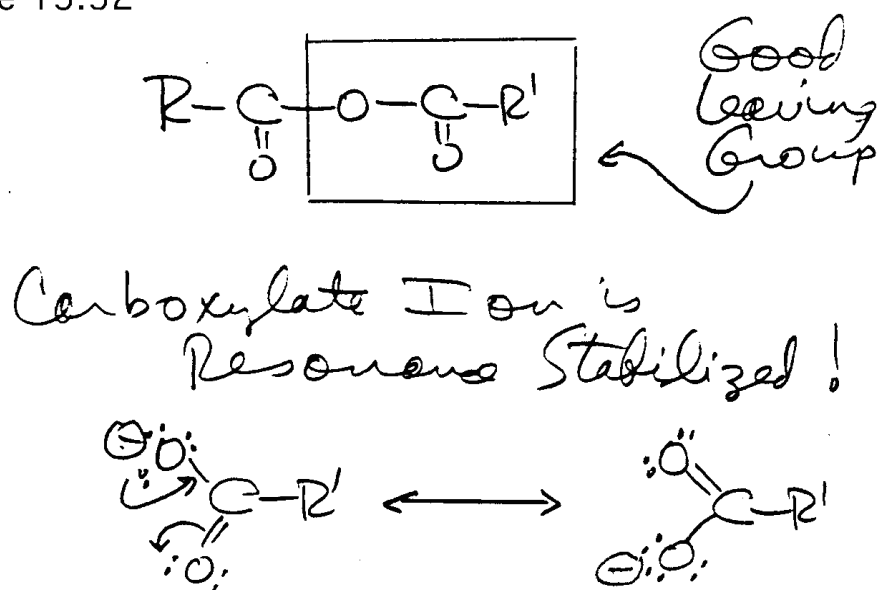


Figure 15.53

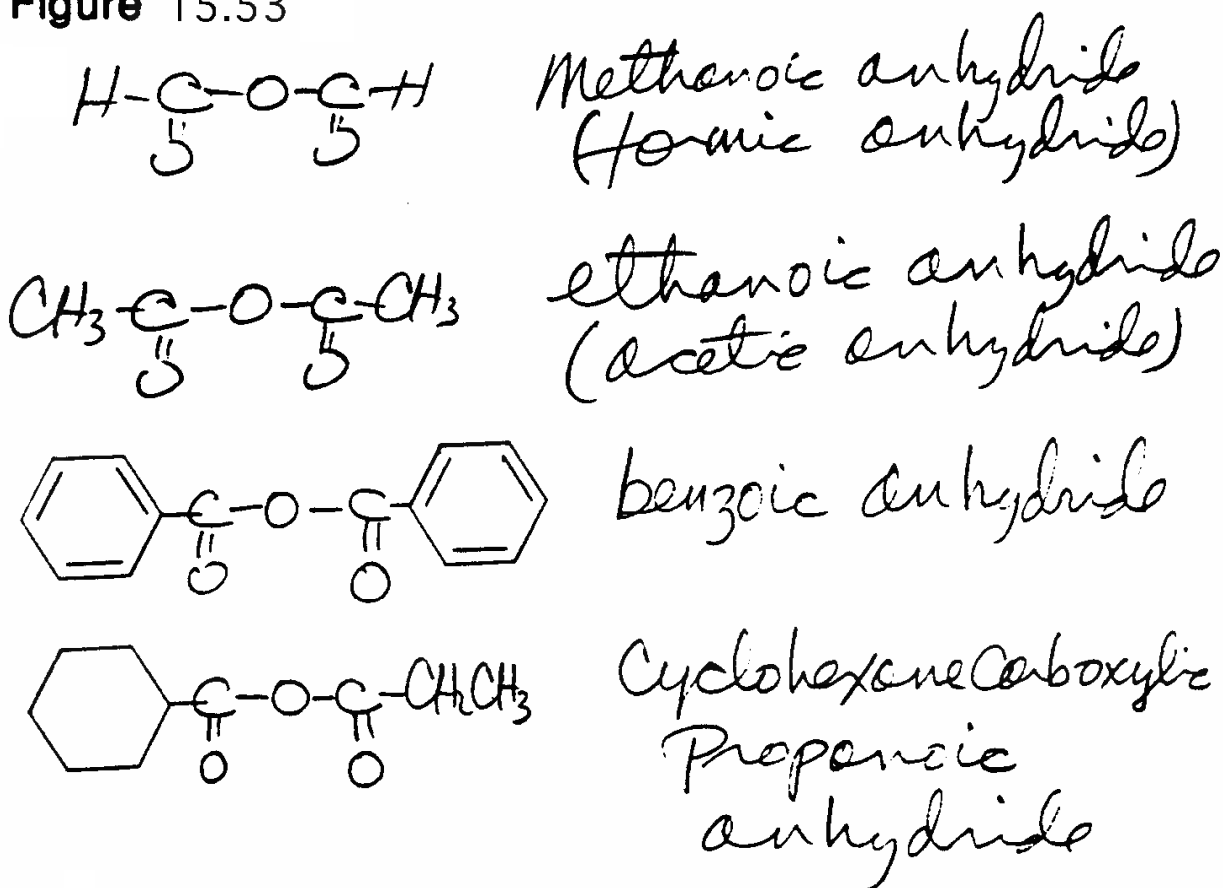


Figure 15.54

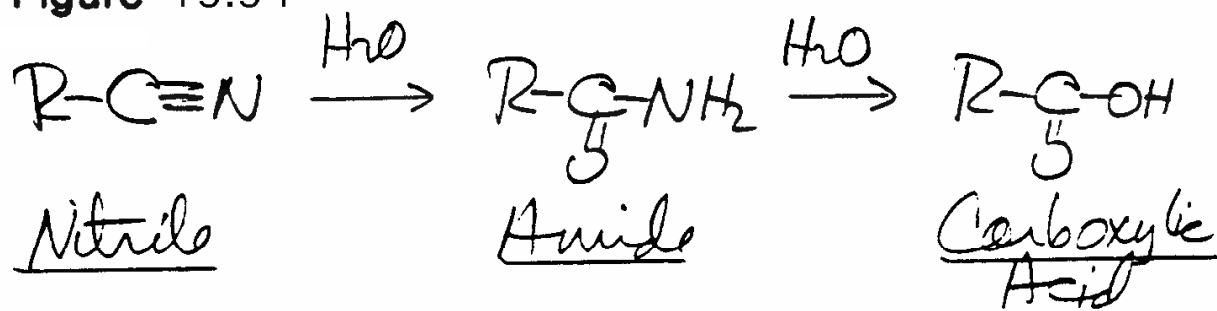


Figure 15.55

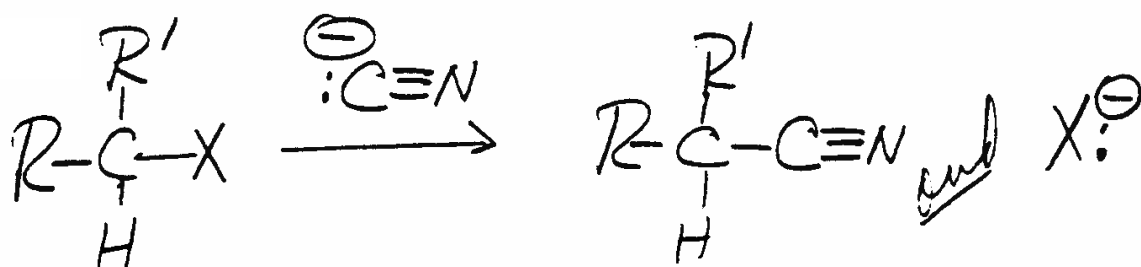


Figure 15.56

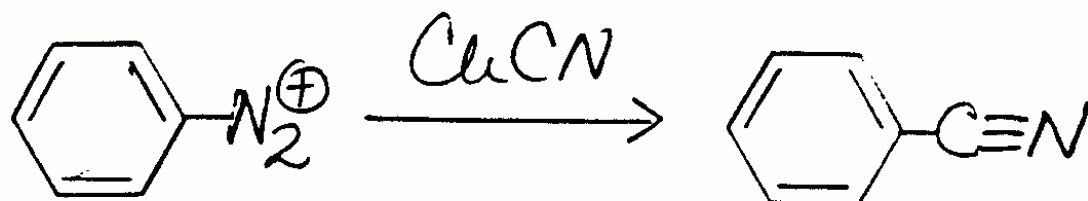


Figure 15.57

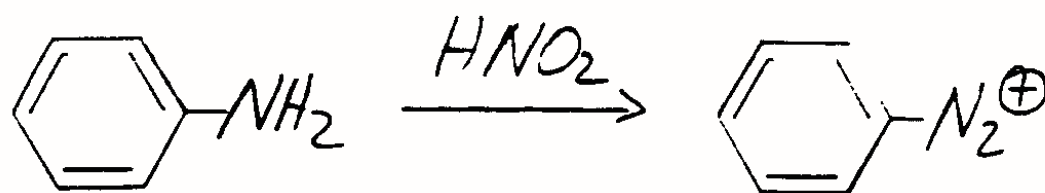
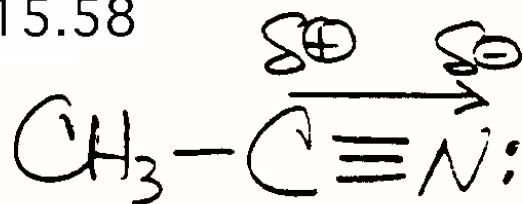


Figure 15.58



Polar Compound
with No H's
Which are attached
to heteroatoms!

Figure 15.59

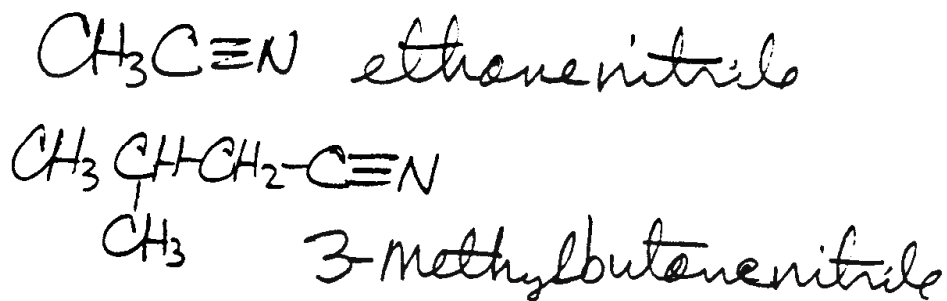


Figure 15.60

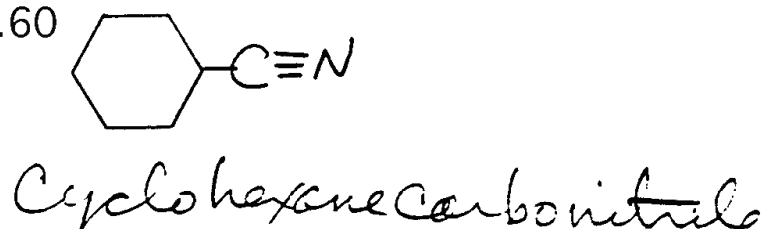


Figure 15.61

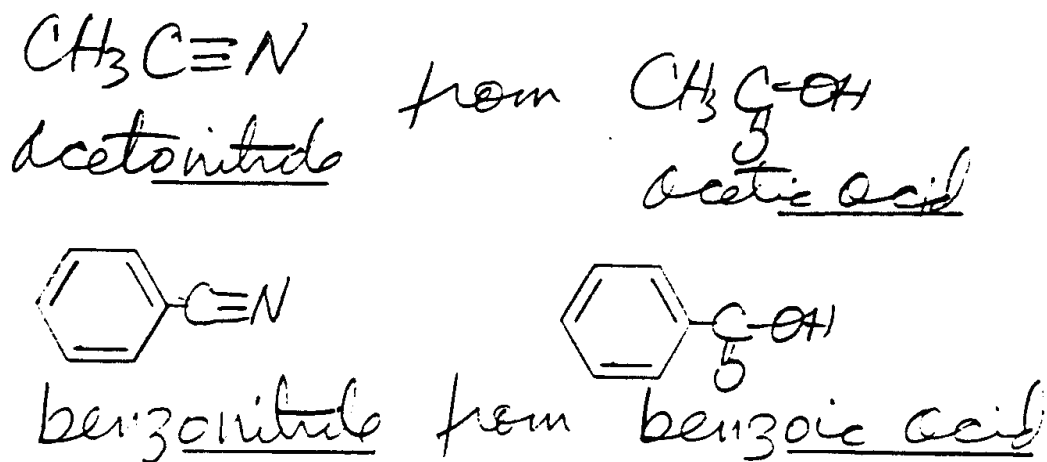


Figure 15.62 Cyclic Anhydride

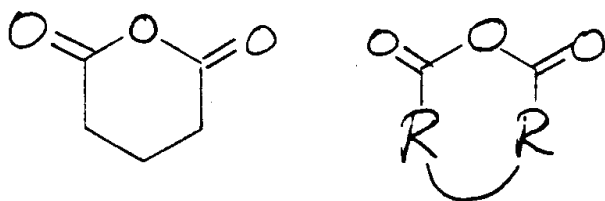


Figure 15.63 Cyclic Esters and Amides

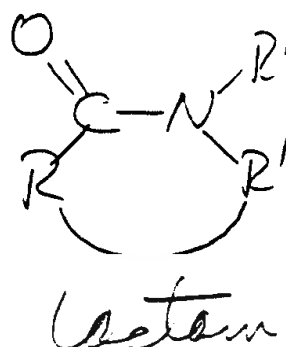
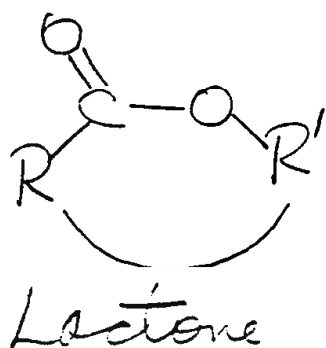
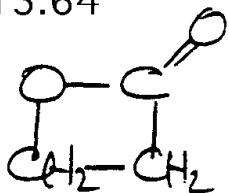
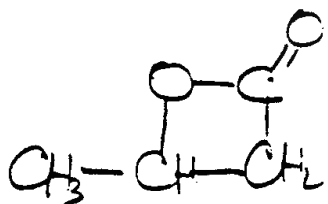


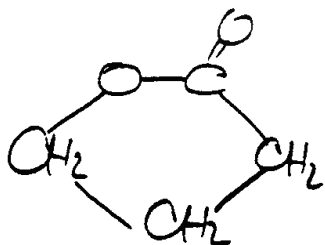
Figure 15.64



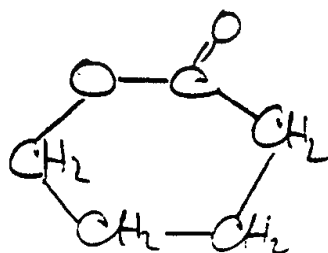
Oxacyclobutan-2-one
(β -proiolactone)



5-methyloxacyclobutan-2-one
(γ -butyrolactone)



Oxacyclopentan-2-one
(γ -butyrolactone)



Oxacyclohexan-2-one
(δ -valerolactone)

Figure 15.65

Origin of Lactone Common Names

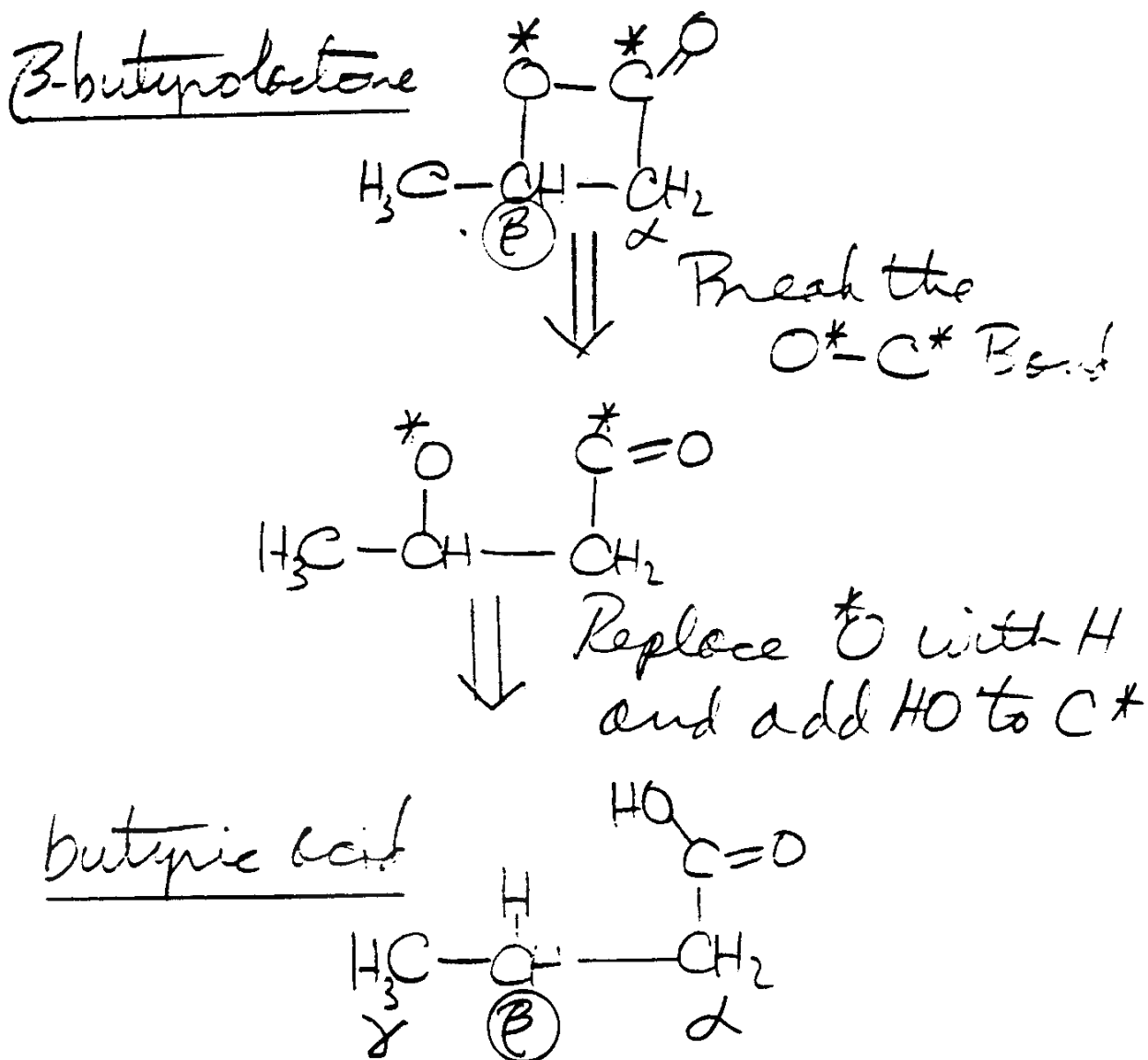


Figure 15.66

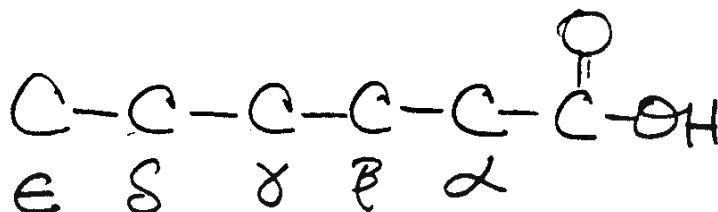
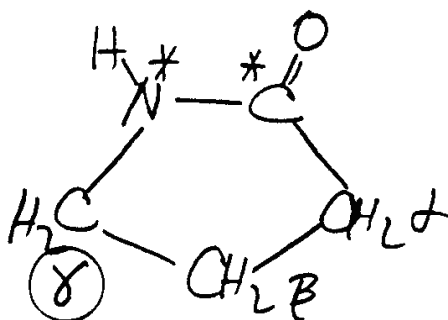


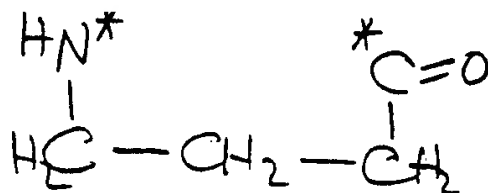
Figure 15.67

Origin of Lactam Common Names

γ -butyrolactam



Break the $N^* - C^*$ Bond



Replace N^*H with H and add HO to C^*

butyric acid

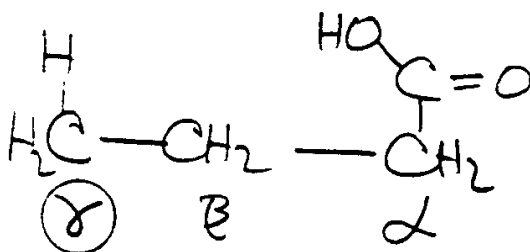
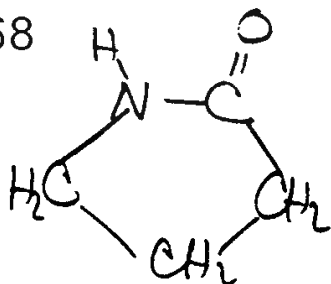


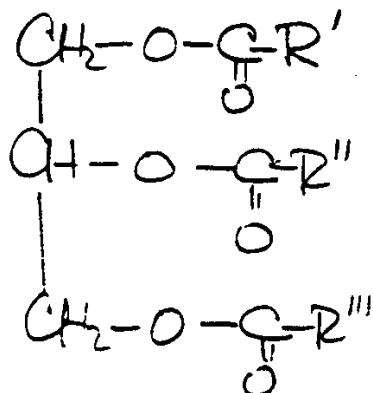
Figure 15.68



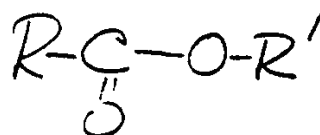
azacyclopentan-2-one
(γ -butyrolactam)

Figure 15.69 General Structures of Fats, Oils, and Waxes

Fats and Oils



Waxes



All R groups are long hydrocarbon chains.

Figure 15.70

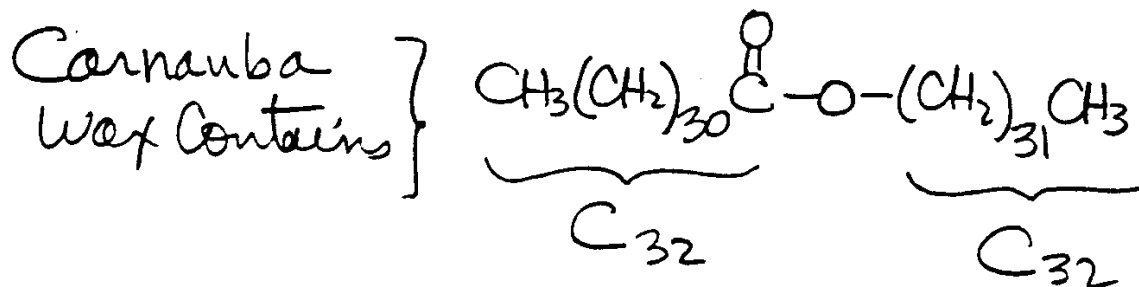
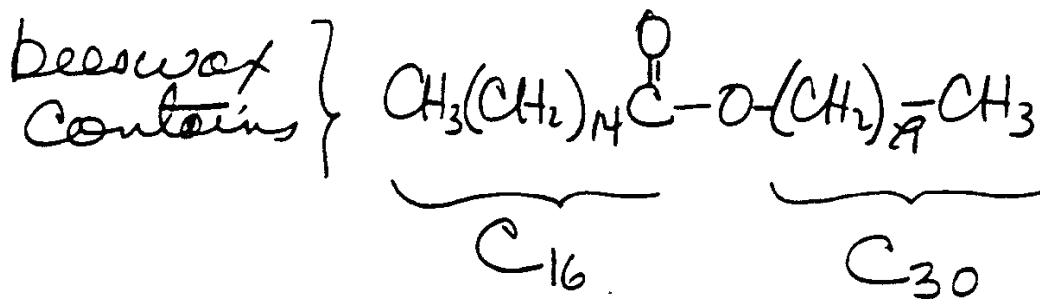


Figure 15.71

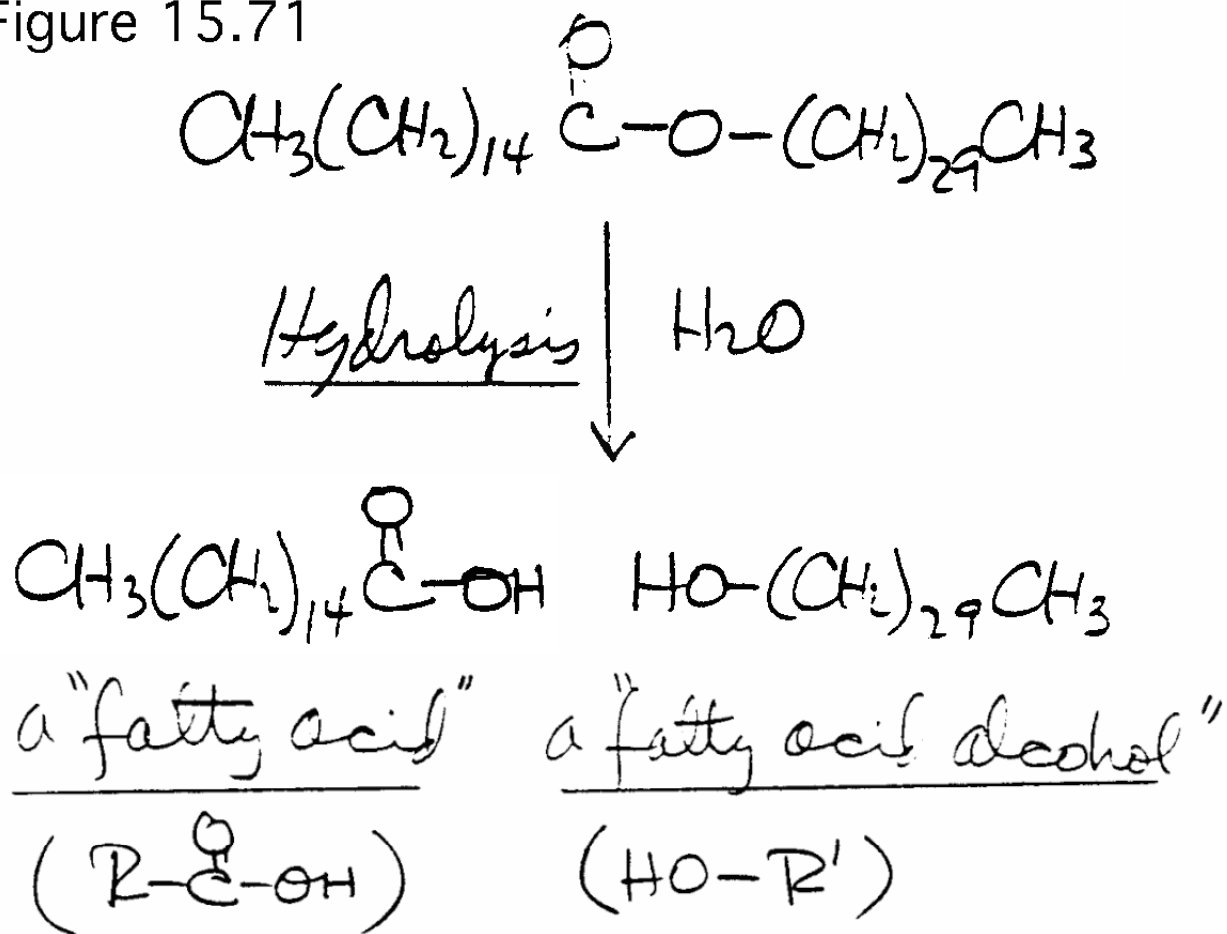


Figure 15.72

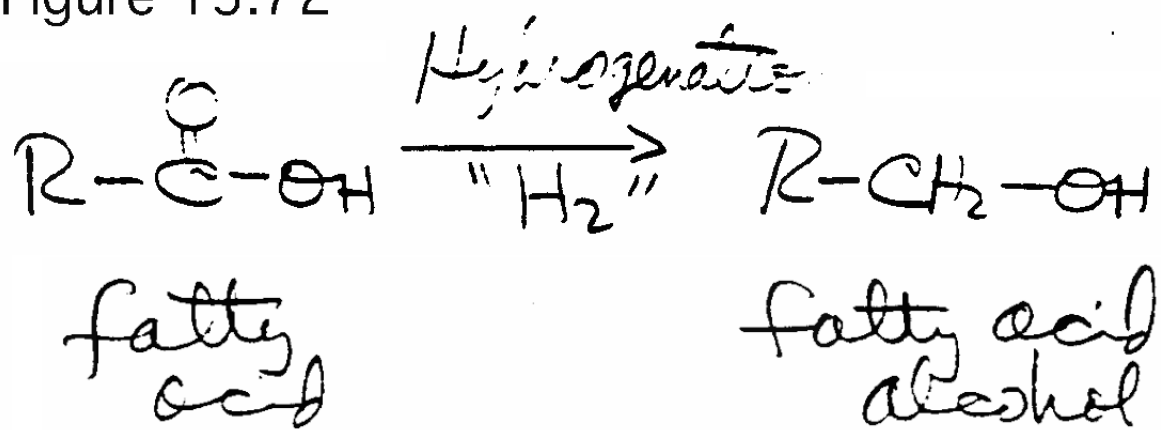


Figure 15.73

Examples of A Saturated and Unsaturated R group in a fat or oil

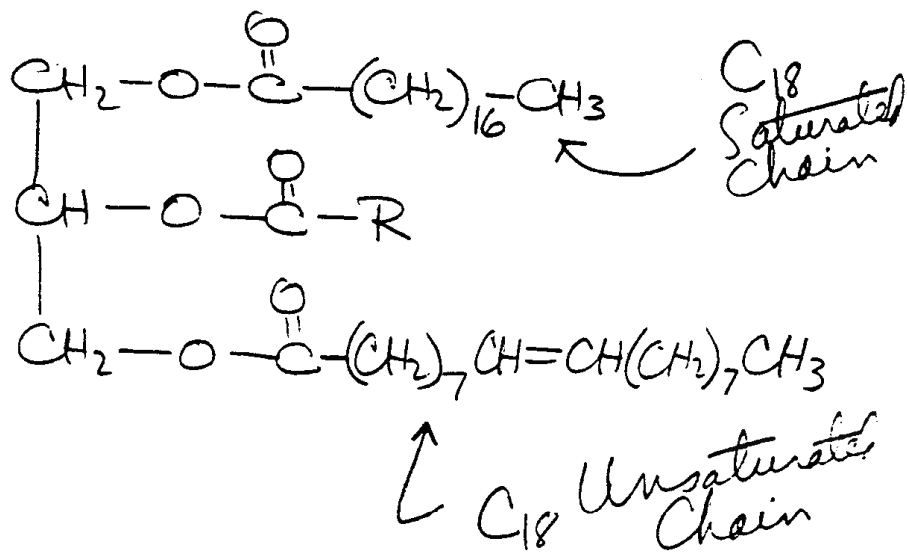


Figure 15.74

Hydrolysis of a Fat or Oil

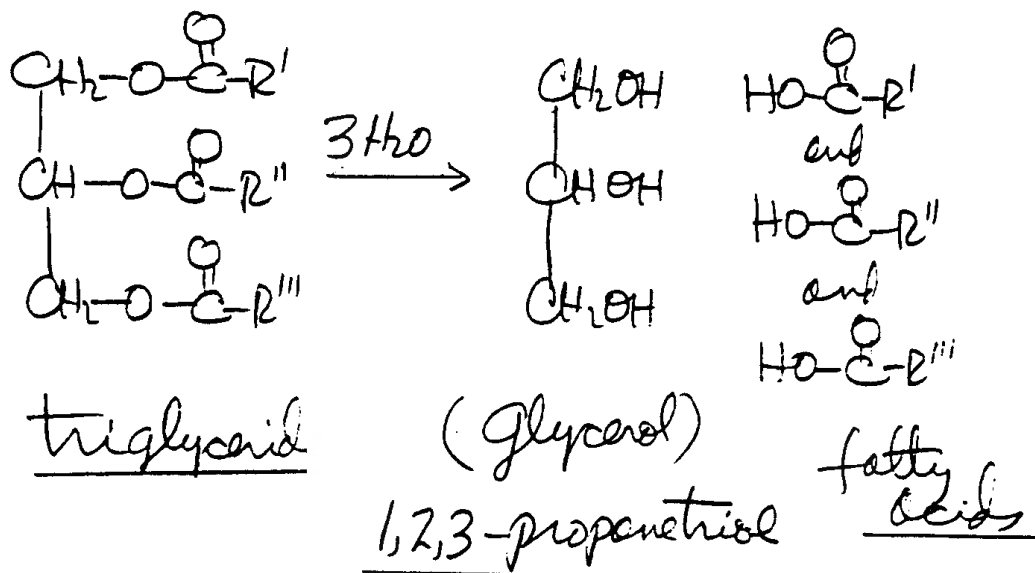


Figure 15.75 A Protein Chain

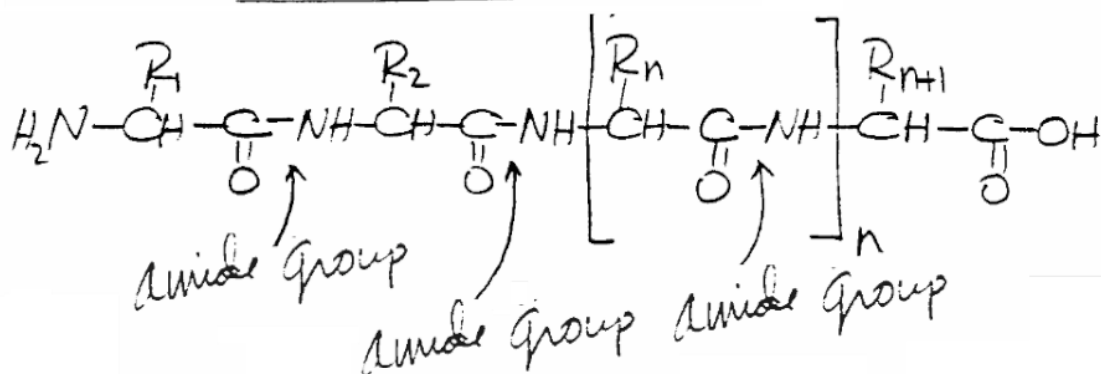


Figure 15.76 Protein

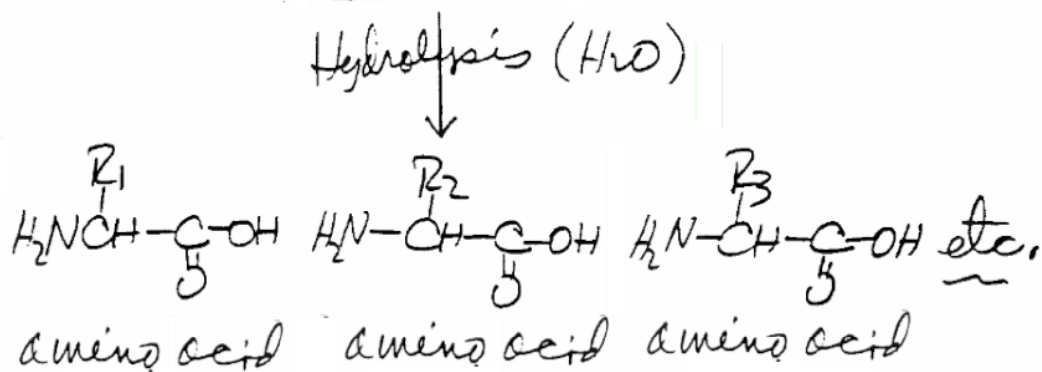


Figure 15.77 Aspartame

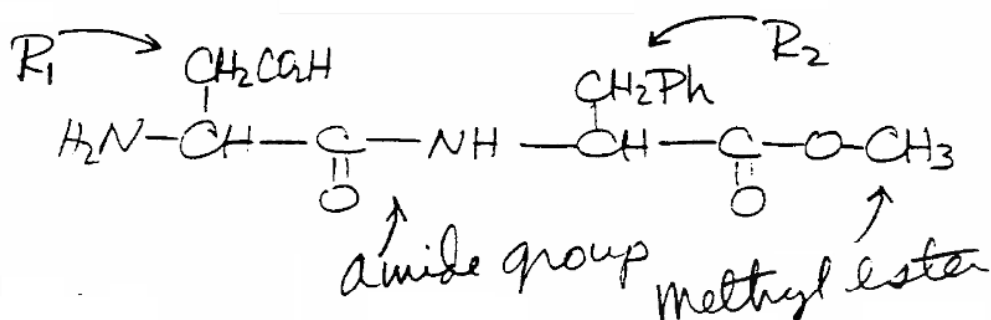


Figure 15.78

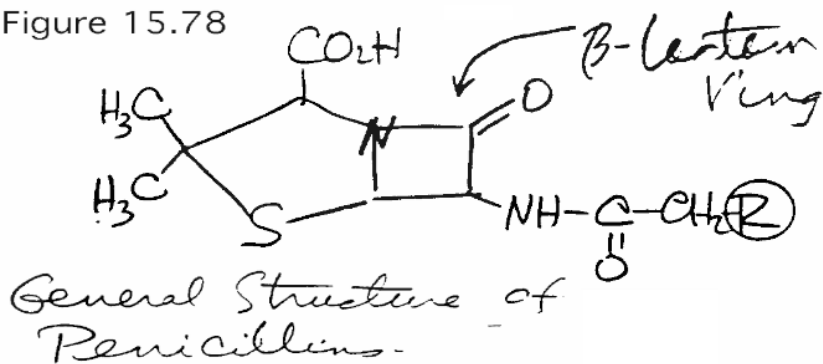


Figure 15.79

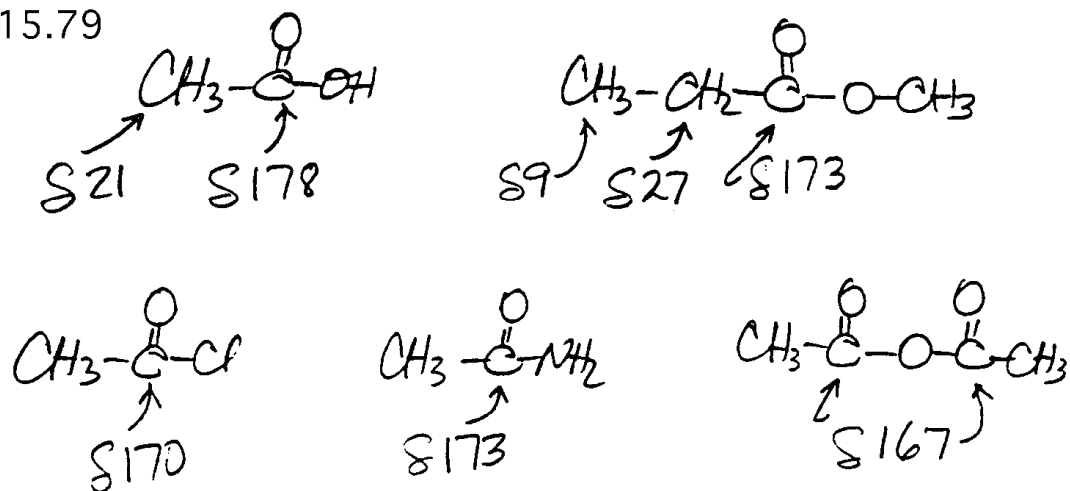


Figure 15.80

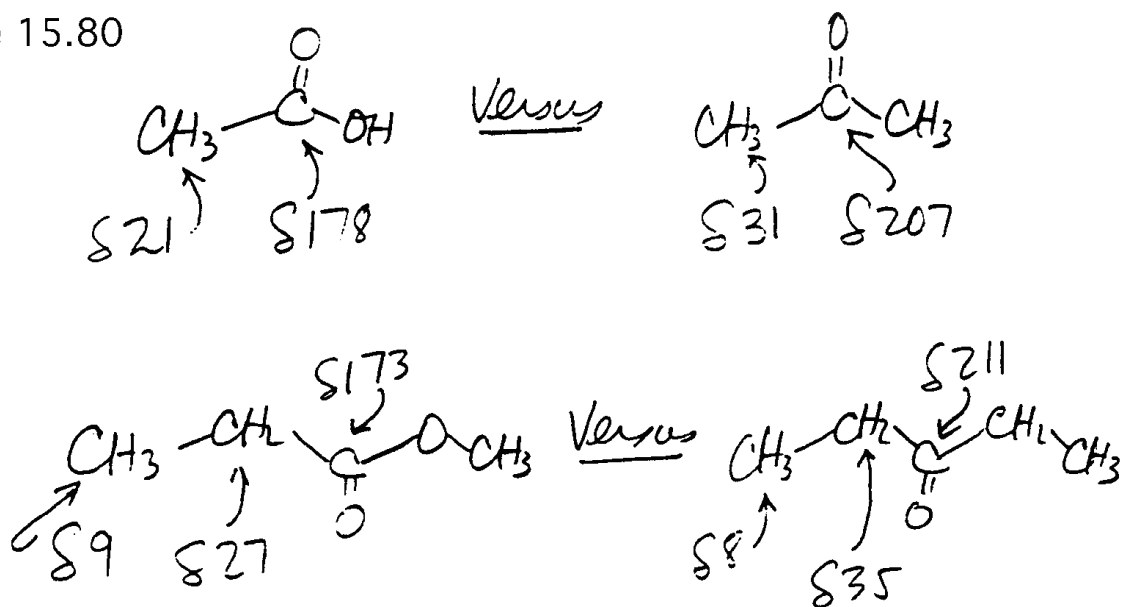


Figure 15.81

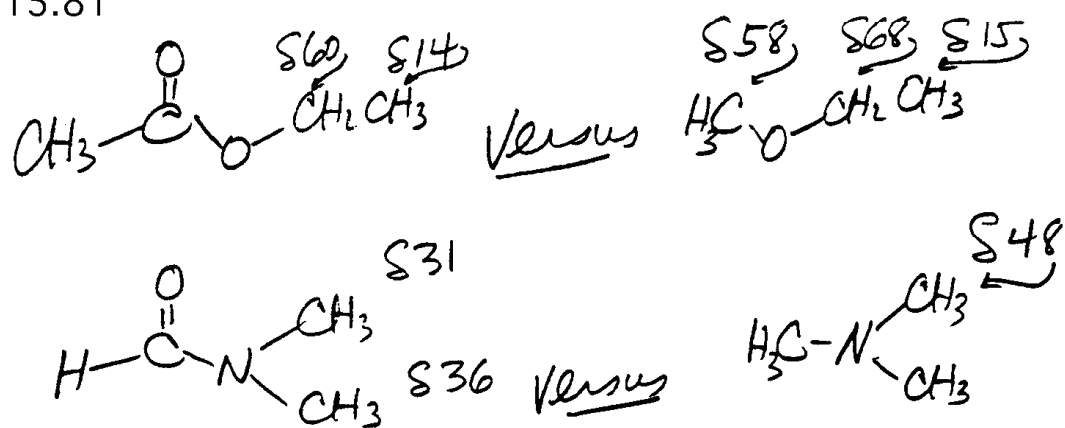


Figure 15.82

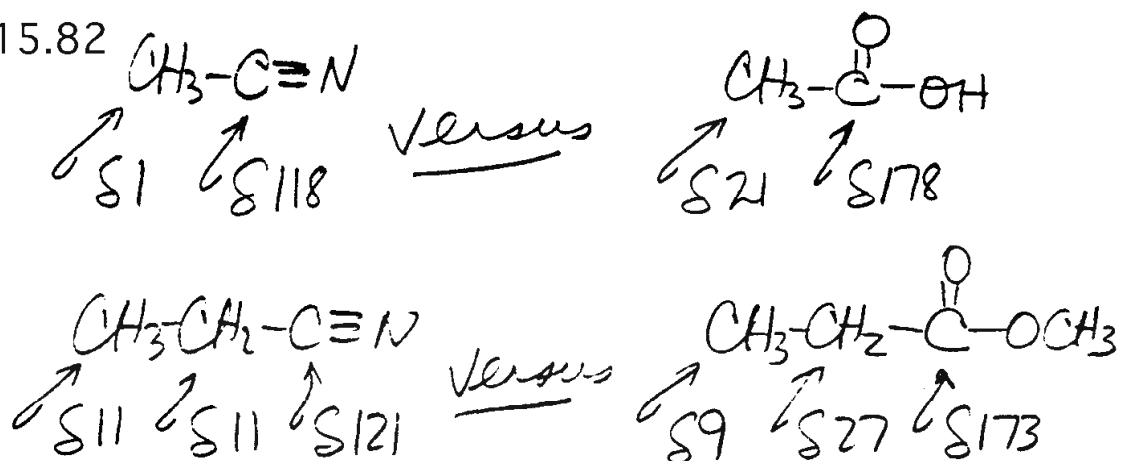


Figure 15.83

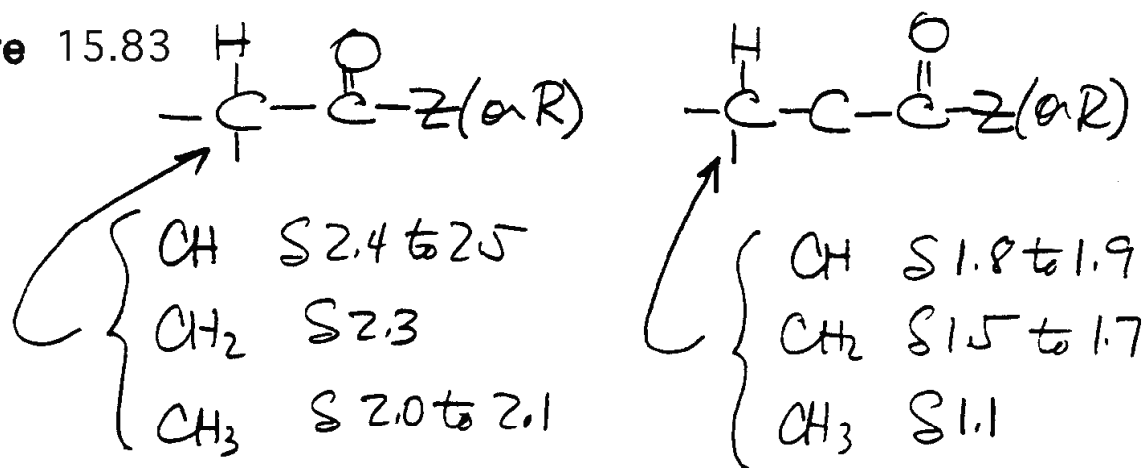


Figure 15.84

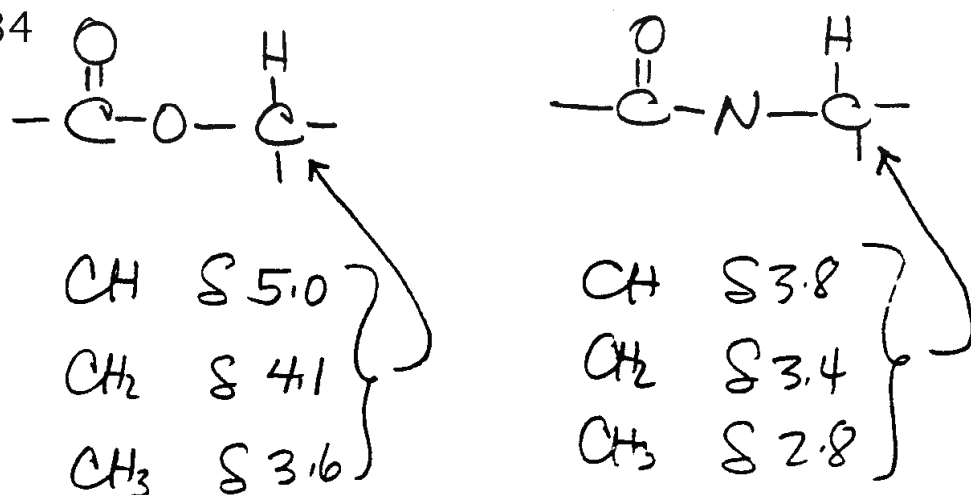


Figure 15.85

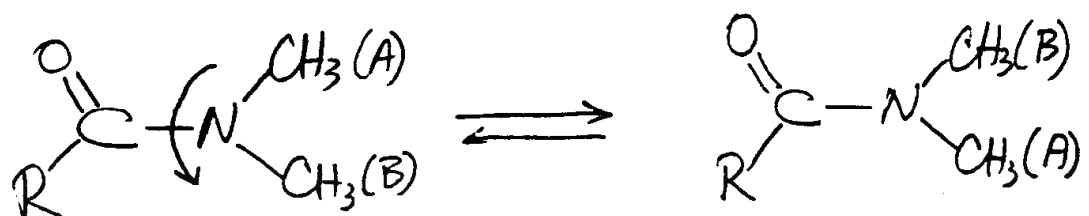


Figure 15.86

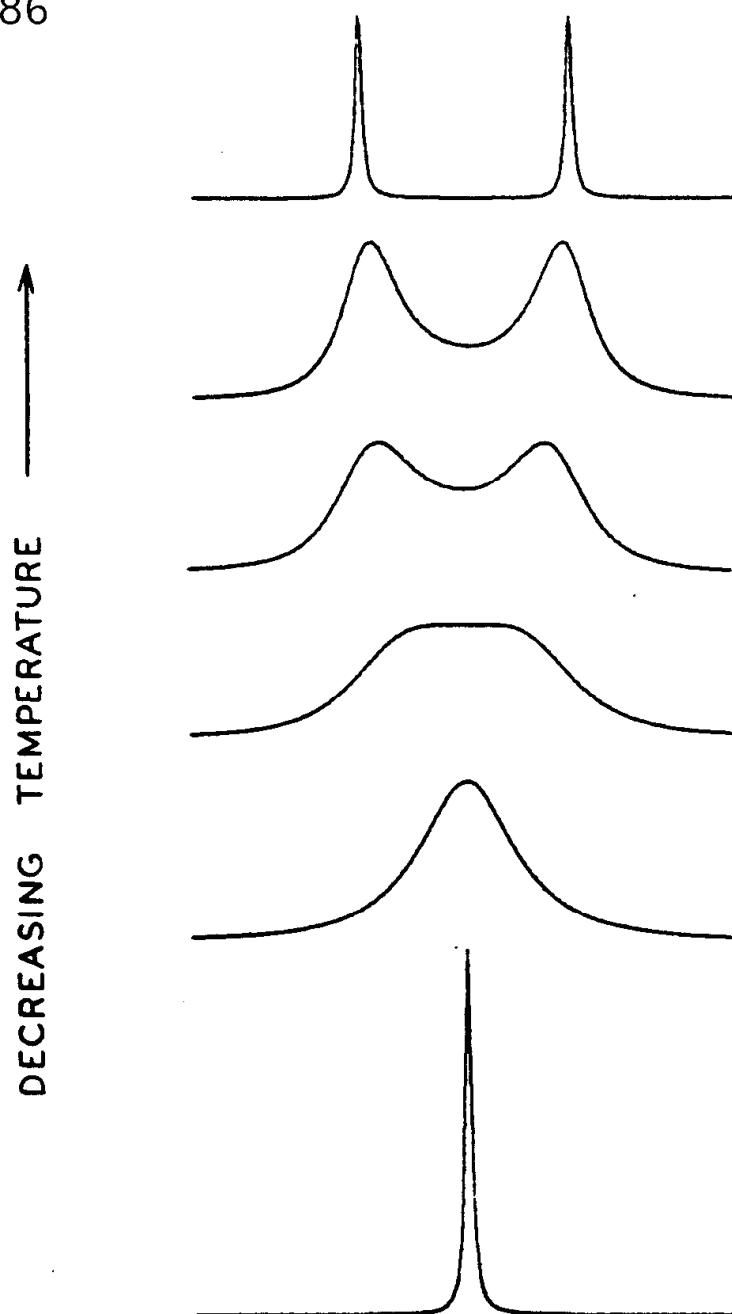


Figure 15.87

