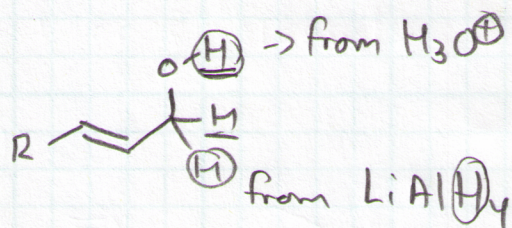
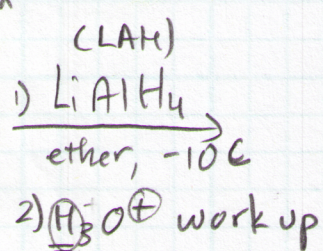
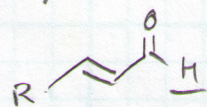


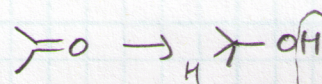
Nucleophilic addⁿ reactions w/ C=O compoundsHydride Addⁿ

Various Nuc's

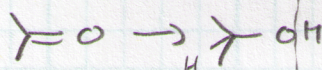
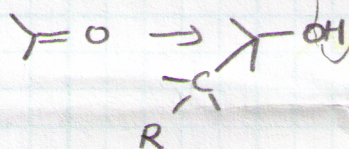
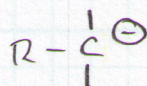
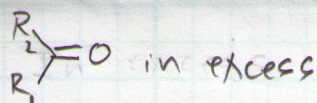
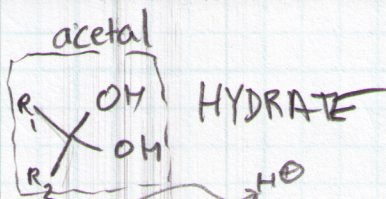
① LAH

solvent
ether

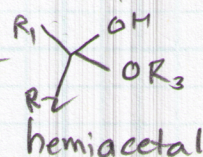
Reactive Species

② $\text{Na}^+ \text{BH}_4^-$

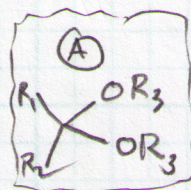
R-OH

Grignard ③ $\text{R}'\text{CMgX}$, etherfrom H_3O^+ ④ H_2O
(XS)acid/base
base⑤ $\text{R}-\text{OH}$
(XS)

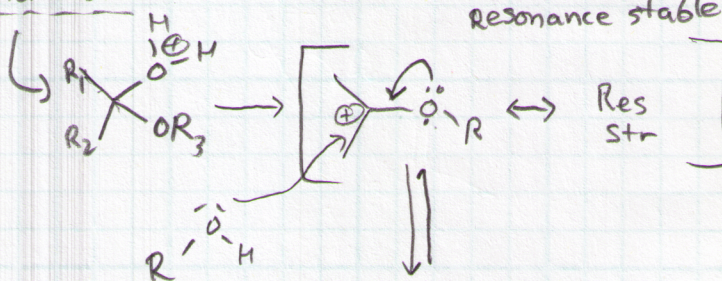
acid/base



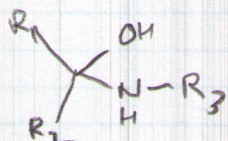
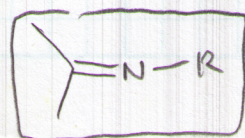
acid only



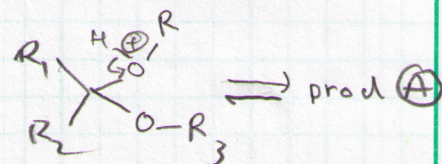
Resonance stable

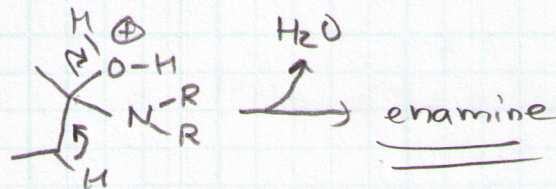
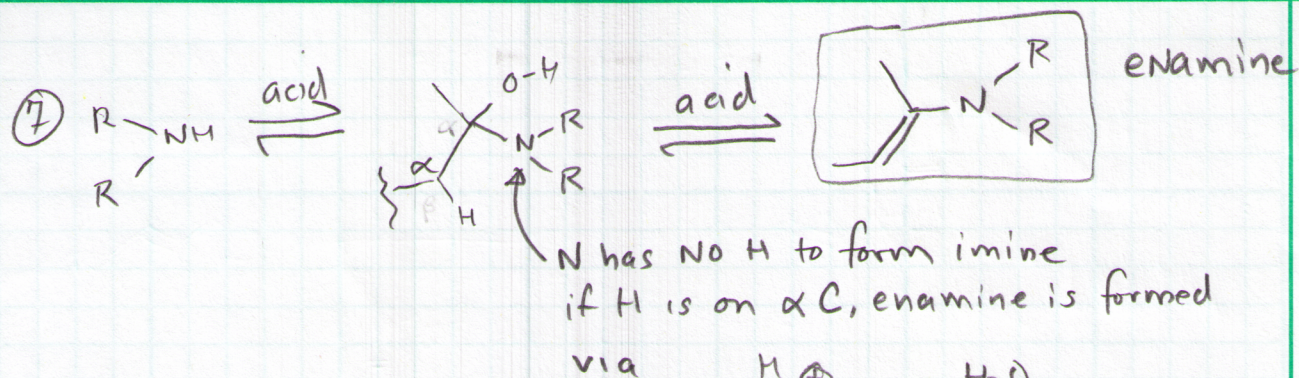
⑥ $\text{R}_3\text{N}-\text{H}_2$

acid

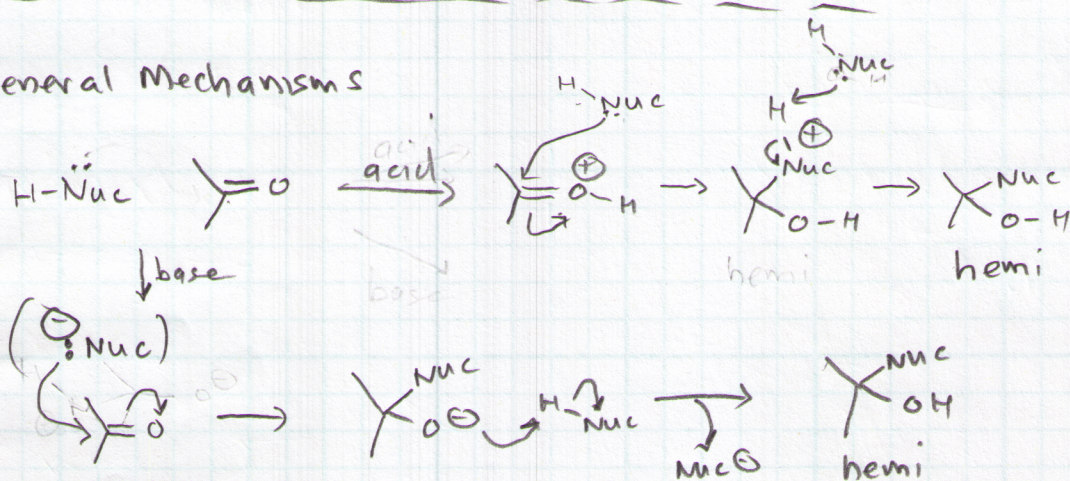
acid ($-\text{H}_2\text{O}$)

IMINE

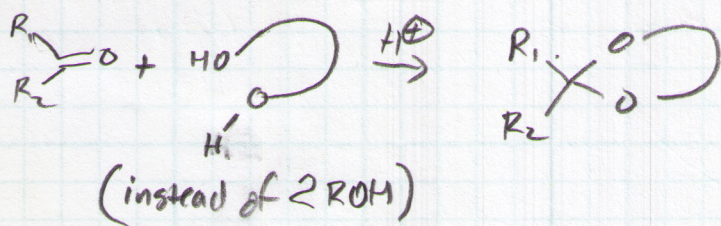




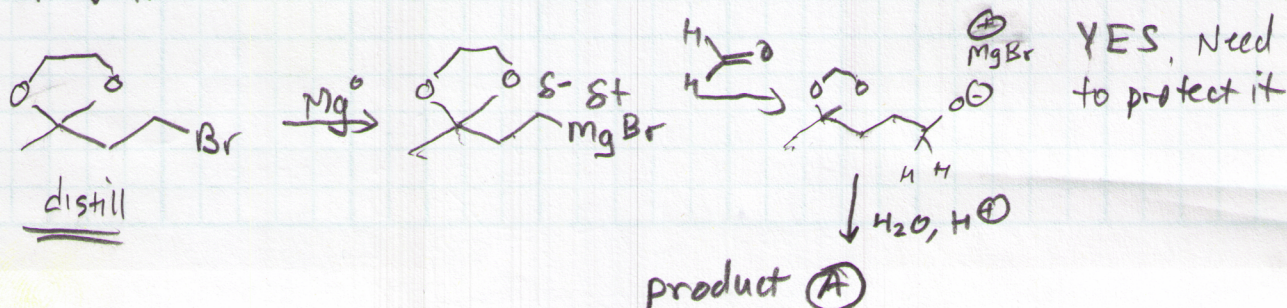
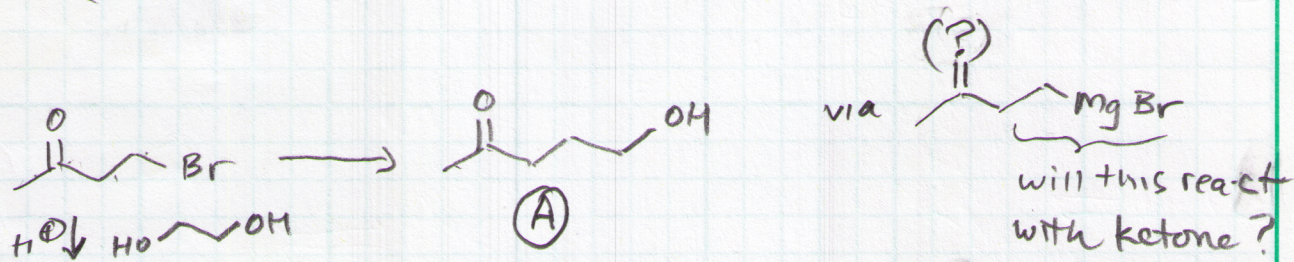
General Mechanisms

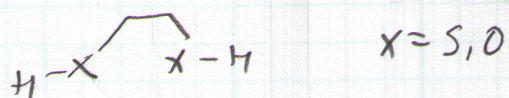


Protecting Groups



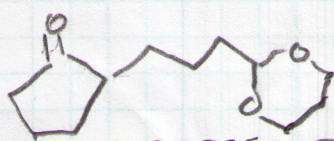
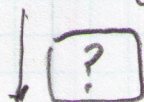
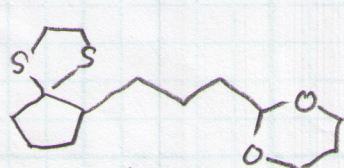
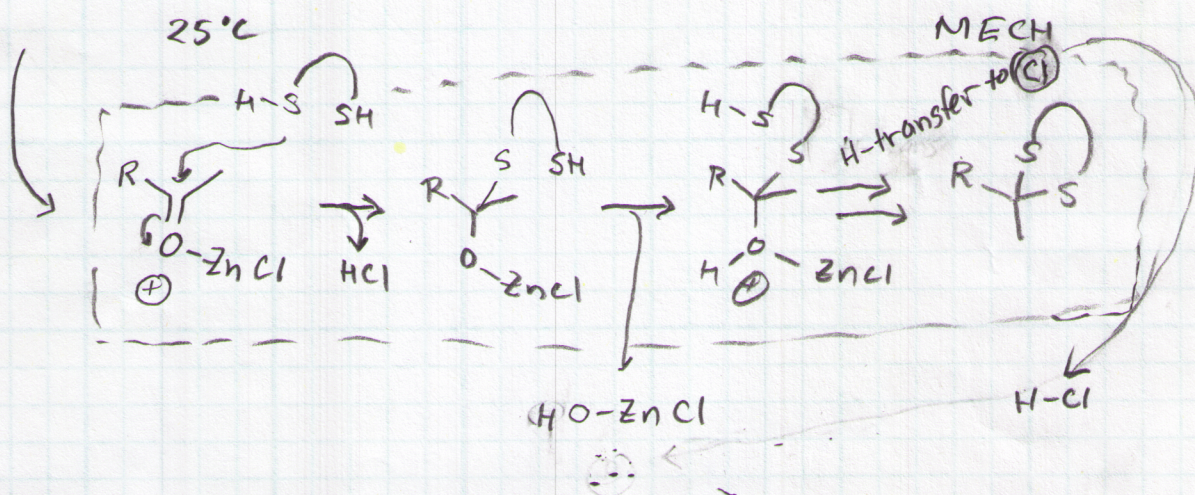
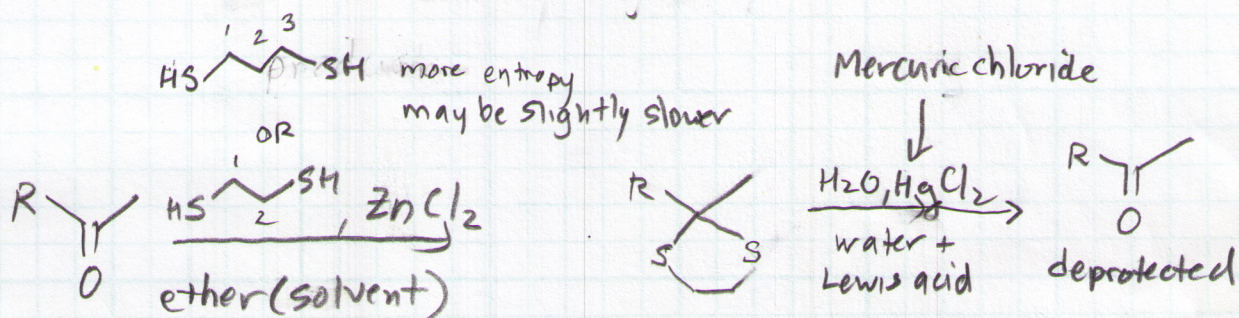
acetal protecting group
keep $C=O$ from reacting
w/ oxidants or reductants





Previous pg shows example when $\text{X} = \text{O}$

Here $\text{X} = \text{S}$ Zinc chloride (ZnCl_2) is used as Lewis Acid over H^+



6-membered ring OR
can be 5-membered ring

