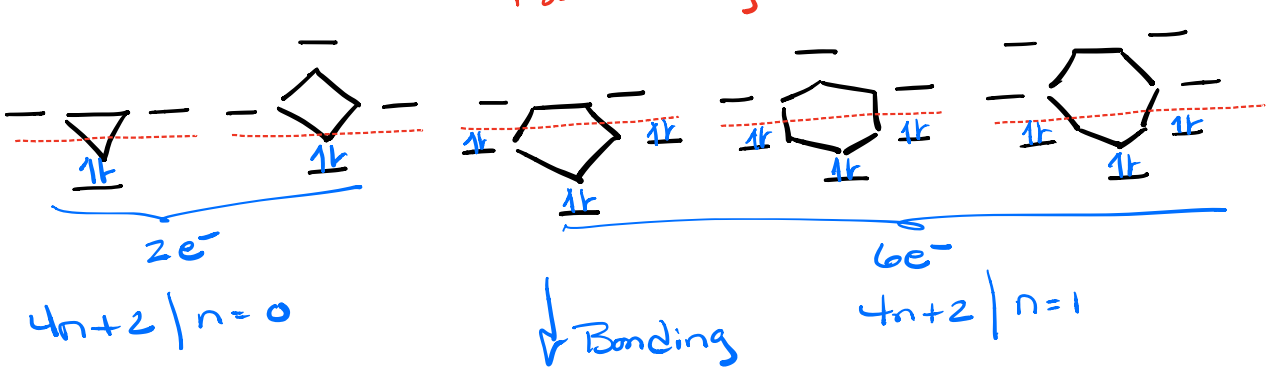
After Spectroscopy

Aromaticity

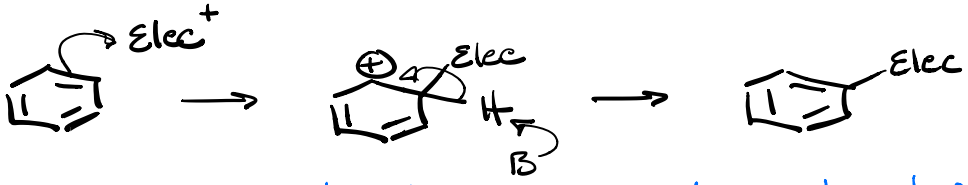
- What makes something aromatic?
  - Ring
  - flat
  - fully conjugated
  - $4n+2\ \pi e^-$ | $n = 0, 1, 2, 3 \ldots$

Frost's Circle analysis showing all bonding orbital full & antibonding empty

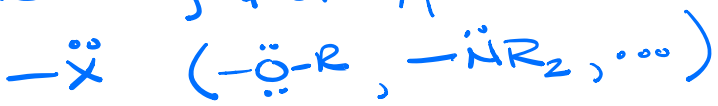


- Reactions of aromatic Systems

Electrophilic aromatic Substitution

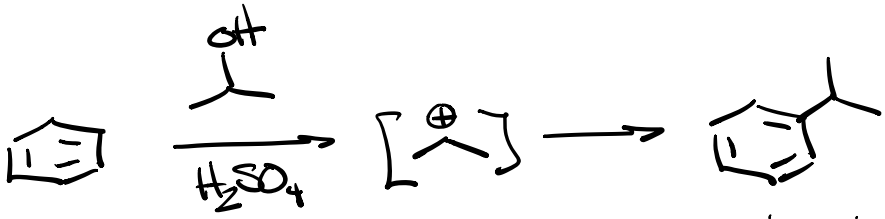


EDG - Activating & ortho/para directors

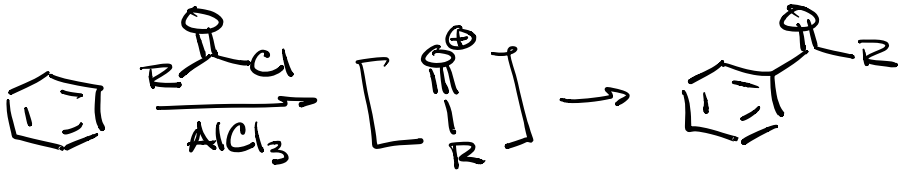


EWG - Deactivating & meta directors

- Alkylations and Acylations (Friedle Crafts)

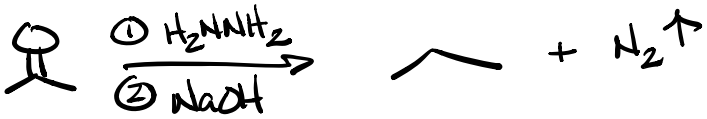


Any way that we could create a Carbocation

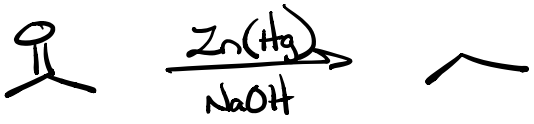


Two reactions to remove (reduce) Carbonyl

Wolff Kishner



Clemmenson

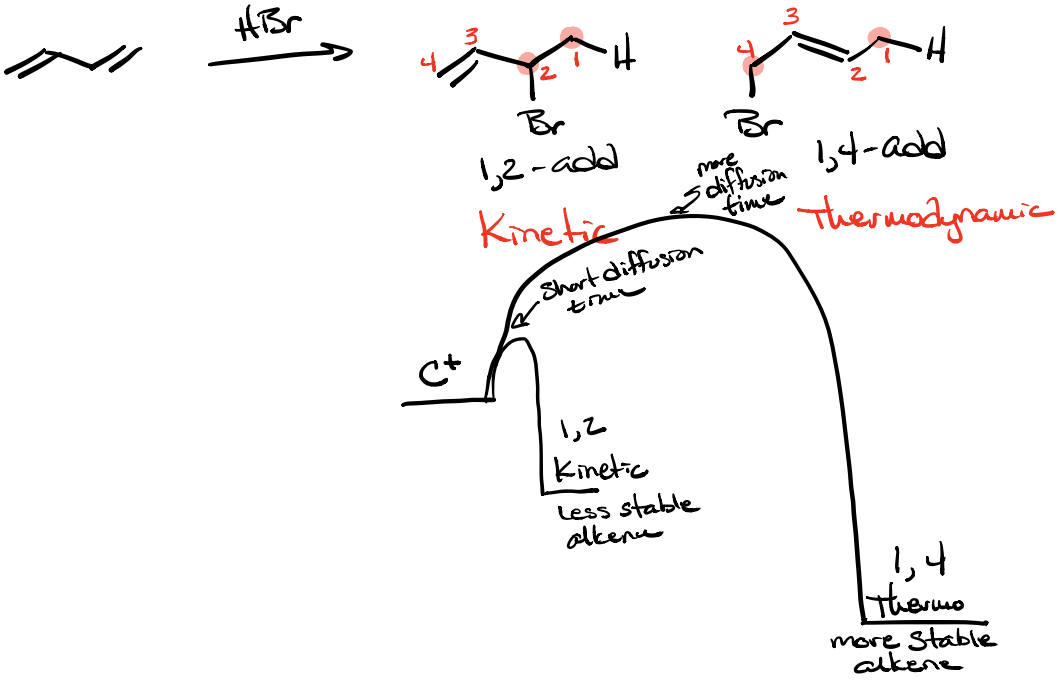


amalgum = solution of two or more metals

organomercury

Diene Systems

– Electrophilic Addition Reactions

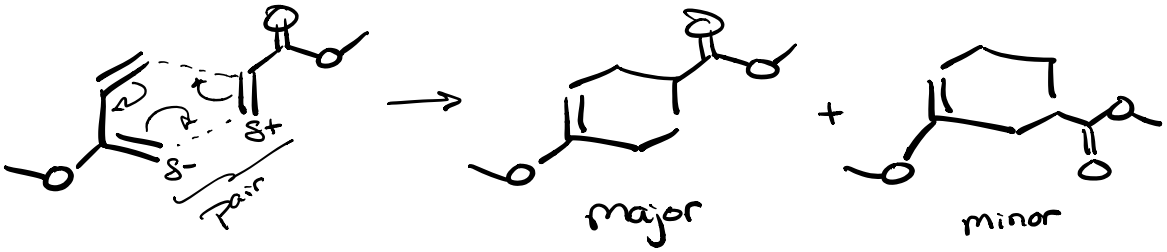


- Diels Alder

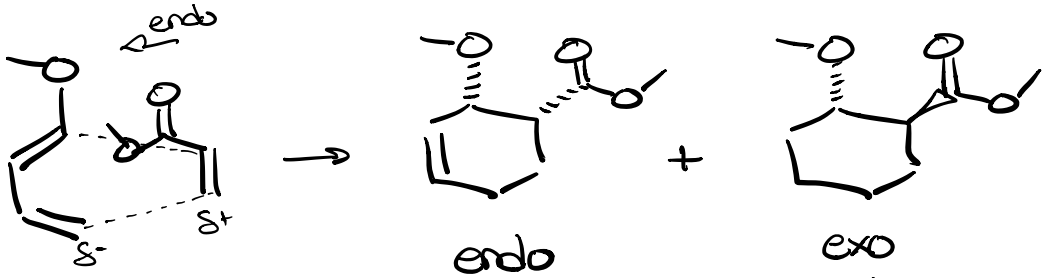
-Concerted Rxn

diene dienophile

-Regiospecific



-Stereospecificity

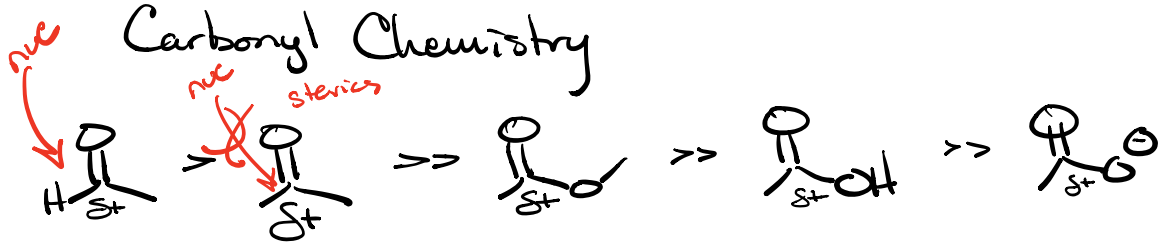


Major

3 orbital overlaps in ≠ that gave lower E_A

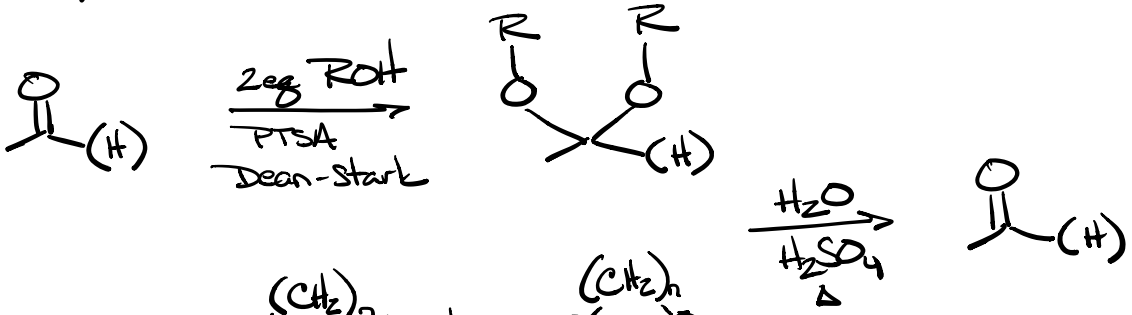
only 2 orbital overlaps

Carbonyl Chemistry

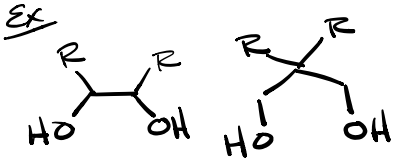


Most Reactive

- Acetals & Ketals



Ex



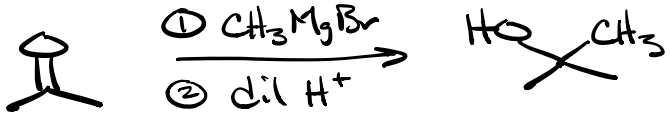
Used to make products, Carbohydrate Chem, protecting Groups

Most other reactions were review

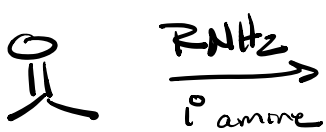
Oxidations

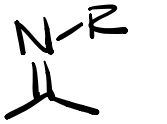
Reductions

Alkylations

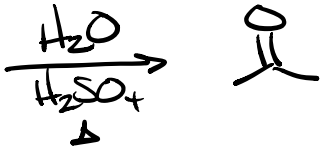


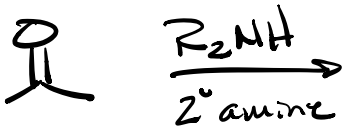
New Reactions





imine



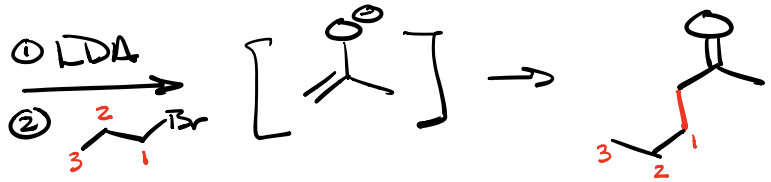


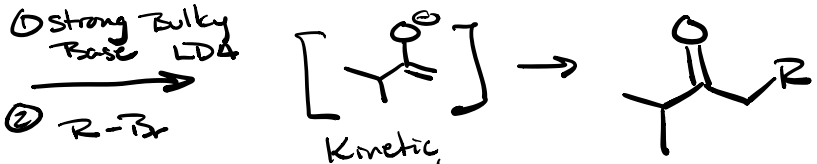
enamine

* Acetal/ketal/Imine/Enamine all use assisted leaving steps ⟹ No S_N2 steps!

Alkylation Reactions at the α position

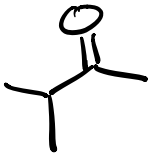
acidic proton
pKa ~ 26

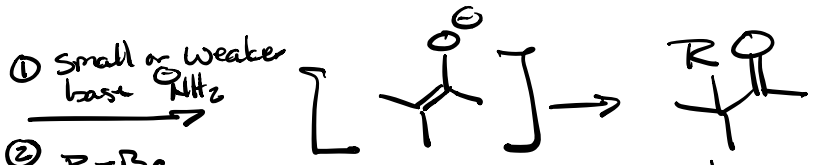




Kinetic enolate

Kinetic



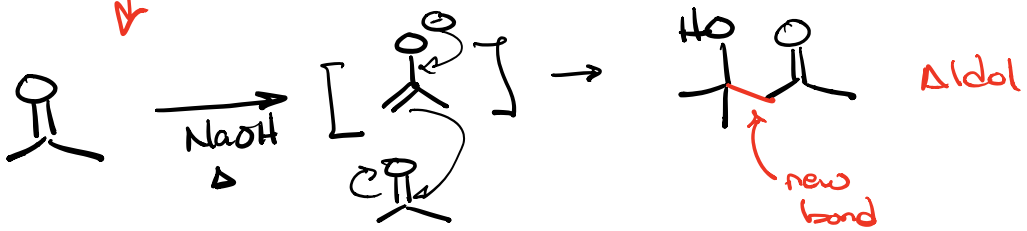


Thermodynamic enolate

thermo

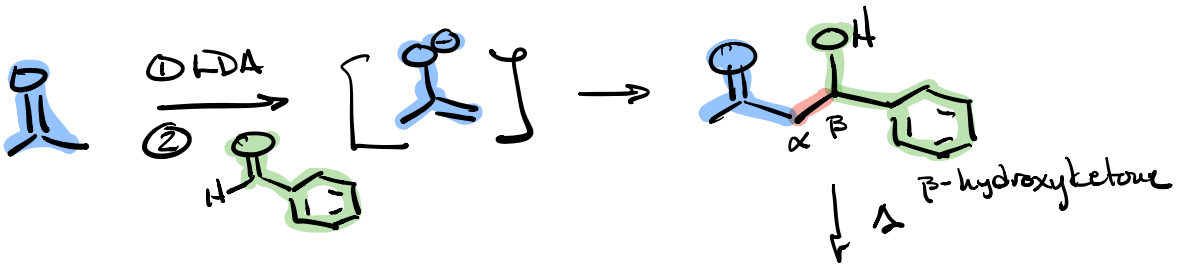
Cut Here

Aldol Reactions

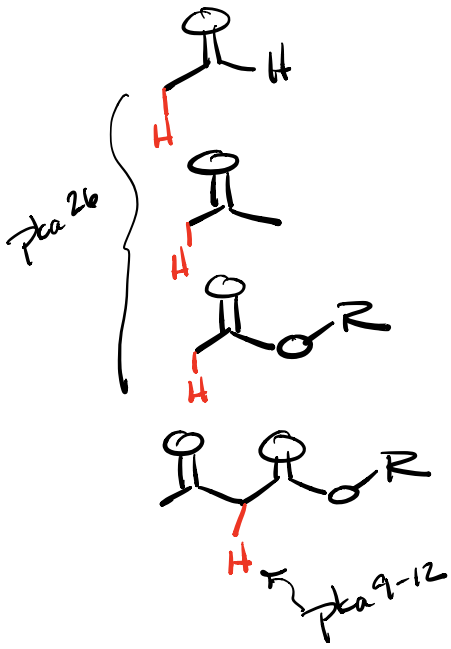


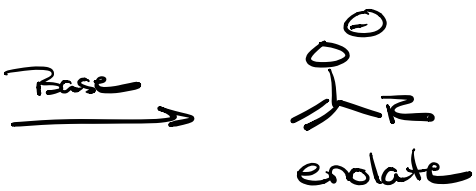
Aldol

new bond



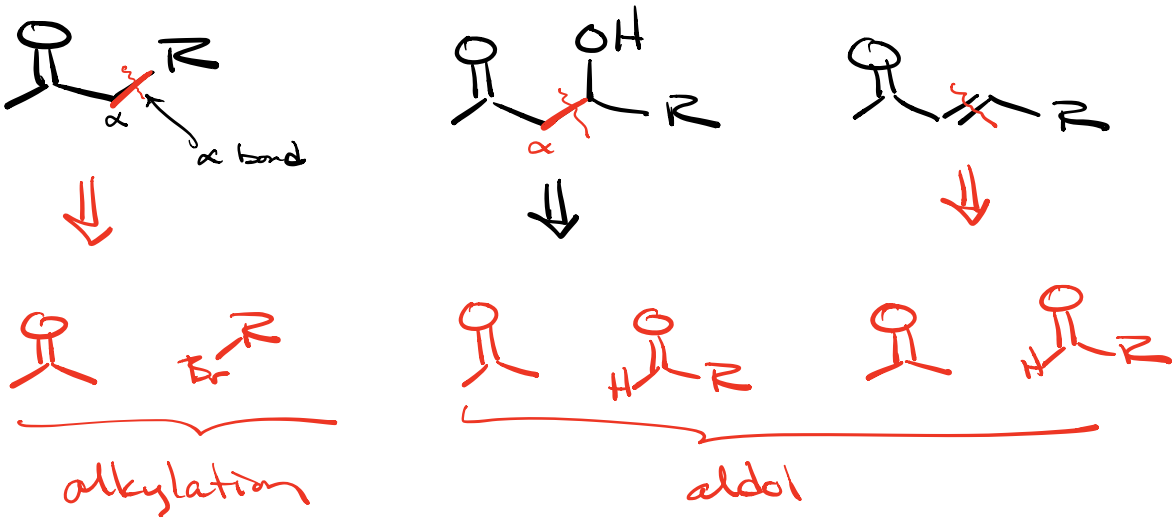
α,β-unsaturated ketone





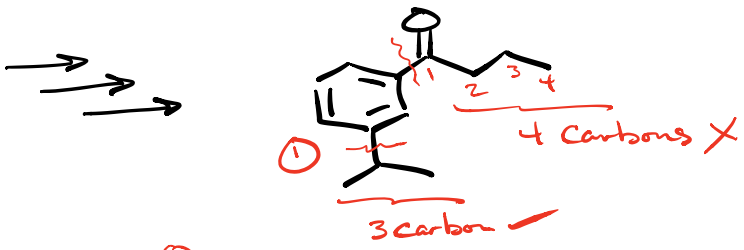
enolate

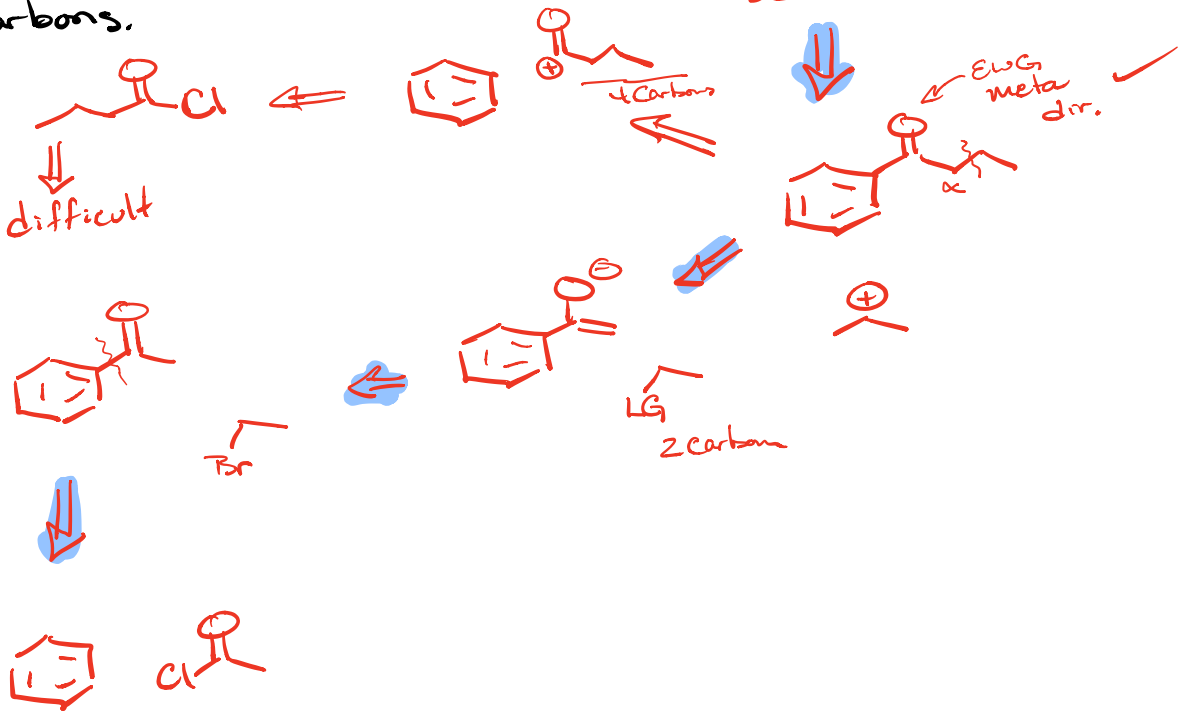
Retrosynthesis

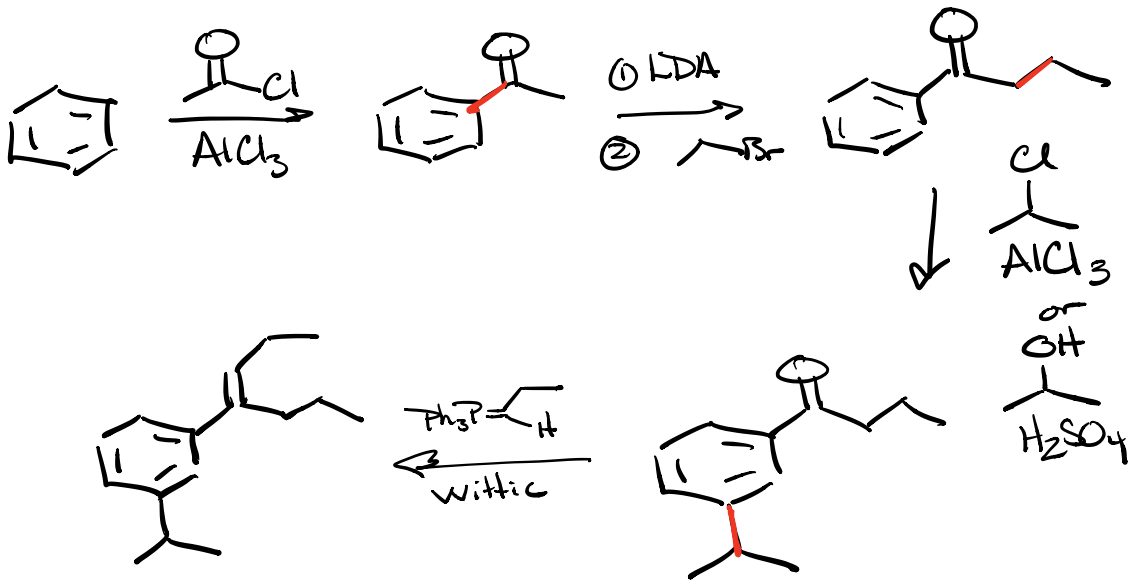


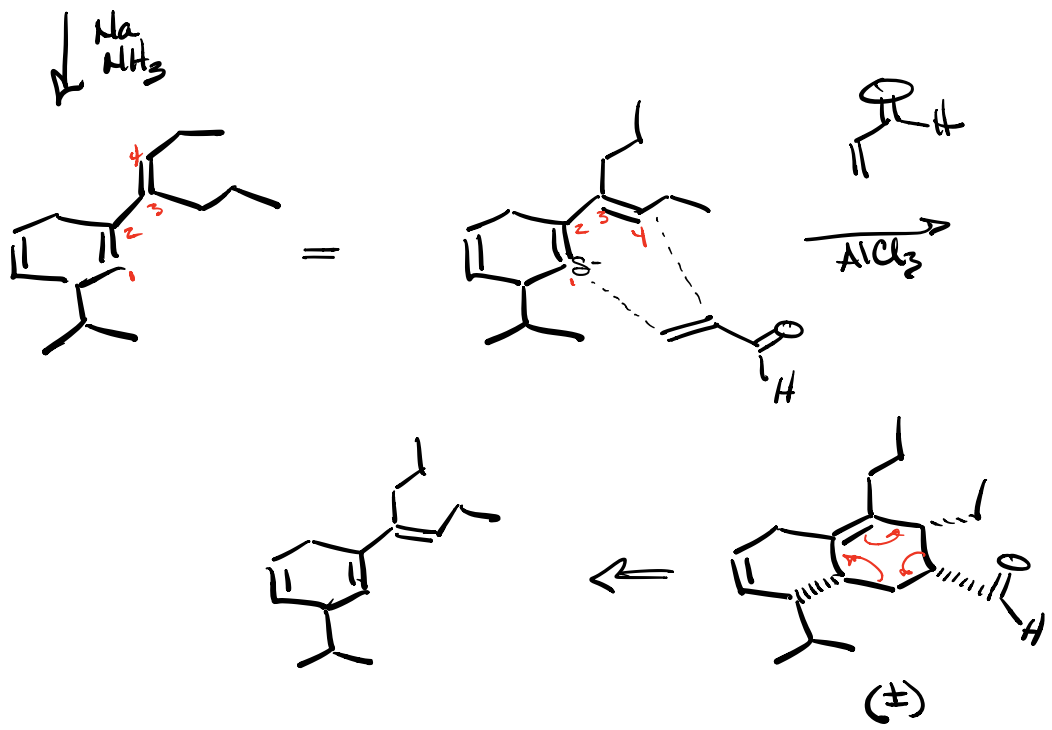
from 

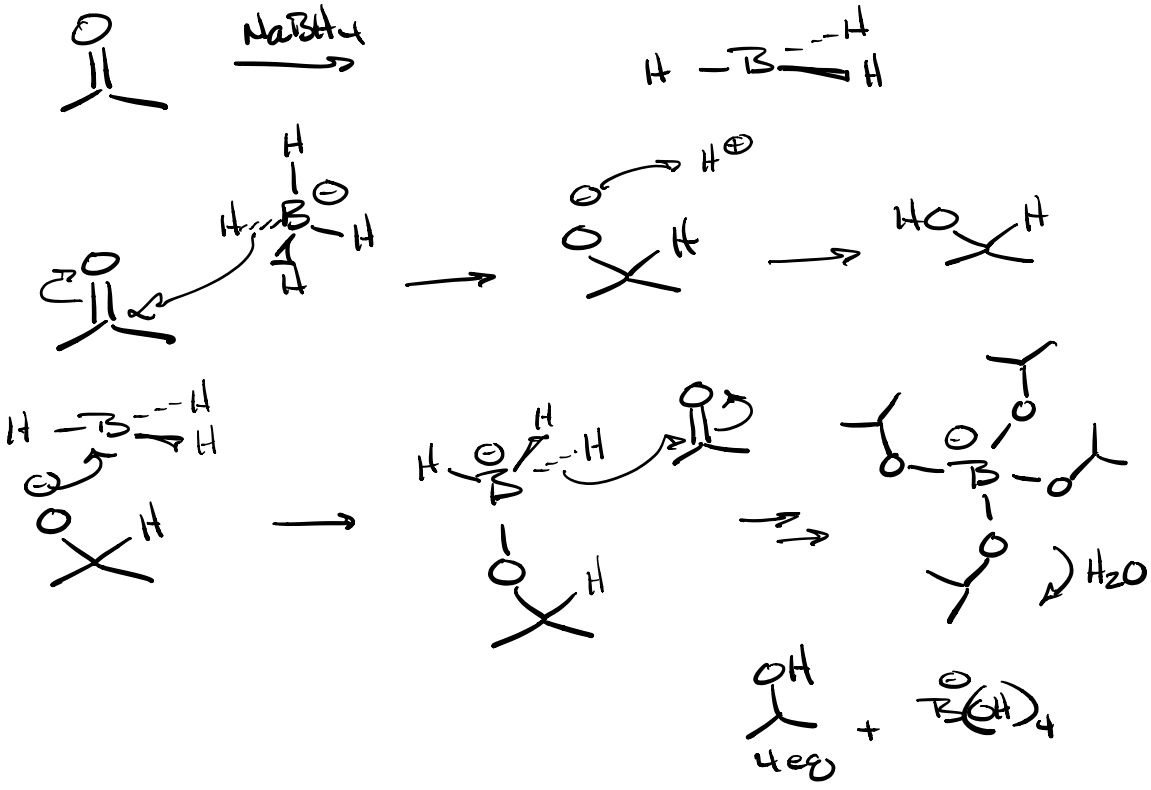
and other reagents of no more than 3 carbons.

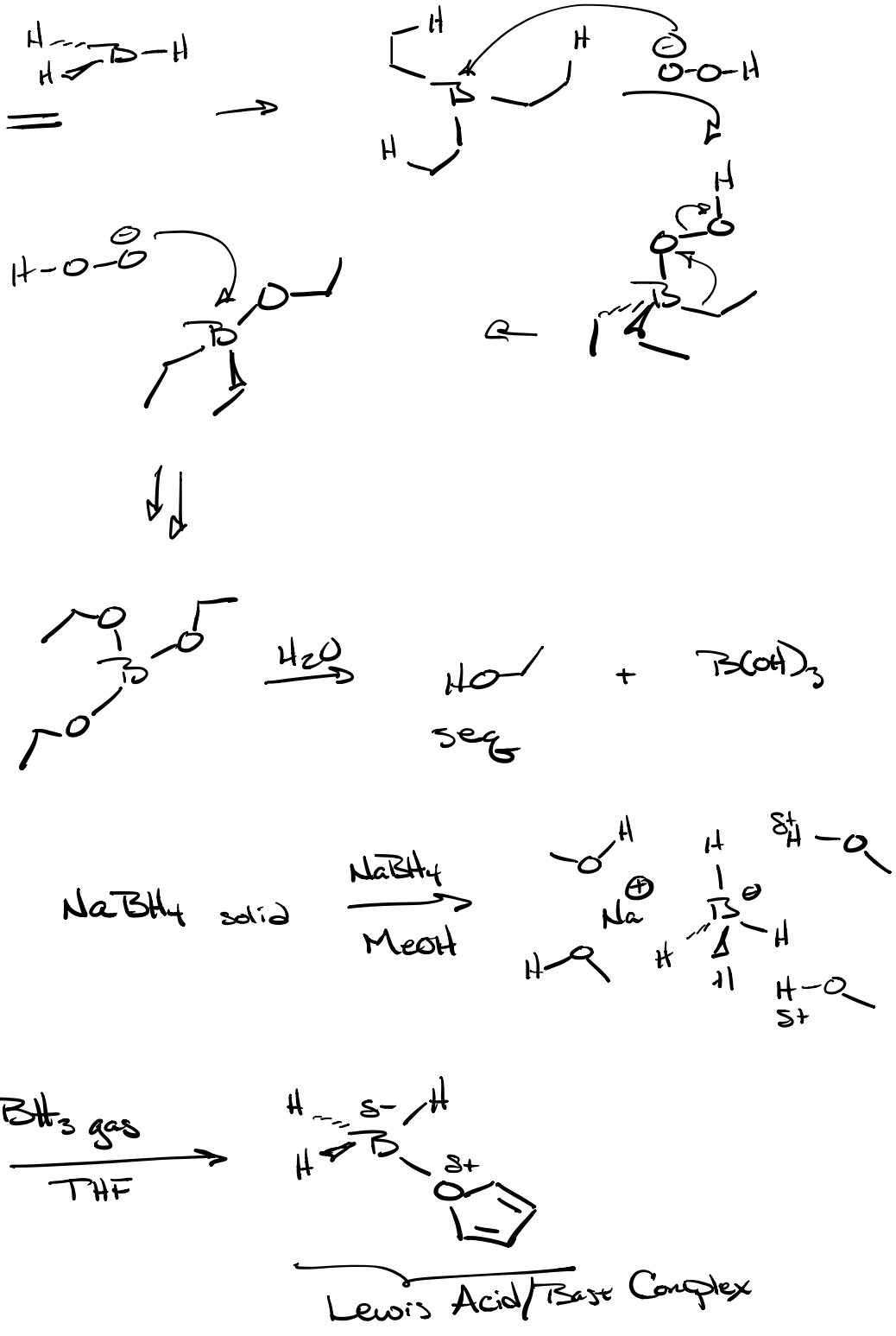







Na
NH3
AlCl3
(±)


NaBH4
4eq


H2O
+
B(OH)3
NaBH4 solid
NaBH4
MeOH
BH3 gas
THF
Lewis Acid/Base Complex