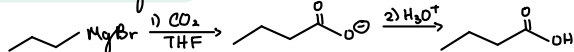


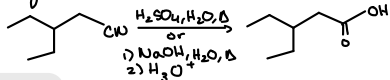
Forming Carboxylic Acids

① Oxidation → Jones, HNO_3 , PCC, MnO_4^- and NaOH

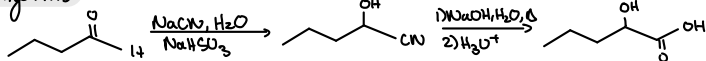
② organometallic reagents (add 1C to chain)



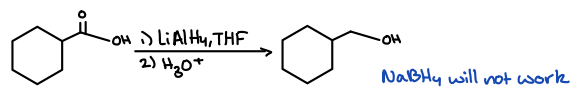
③ Hydrolysis of Nitriles



Cyanohydrins

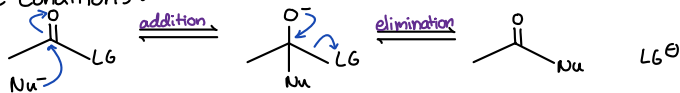


Reduction of COOH

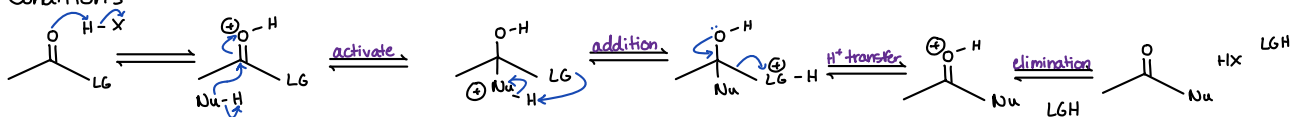


Nucleophilic Acyl Substitution

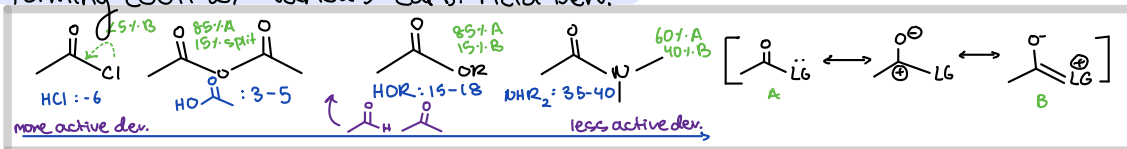
Basic Conditions



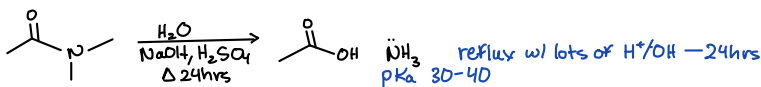
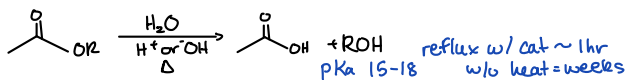
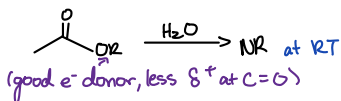
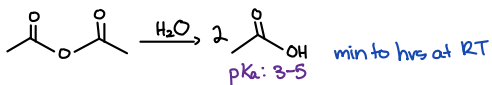
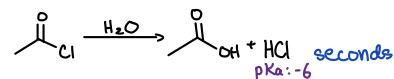
Acidic Conditions



Forming COOH w/ Various Carb. Acid Deriv.

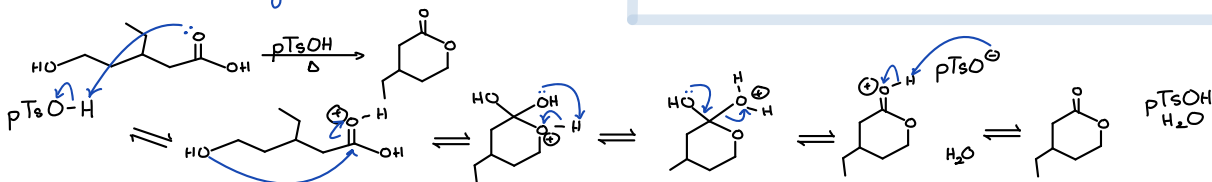
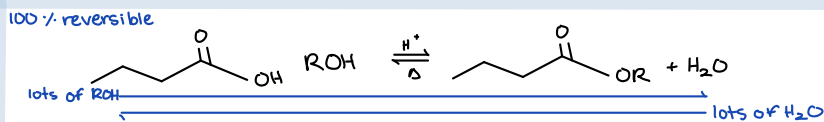
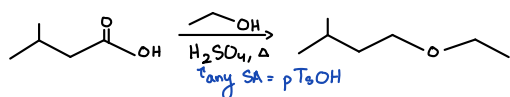


Hydrolysis



Carboxylic Acids — Fischer Esterification

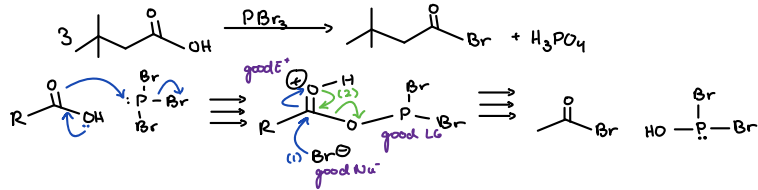
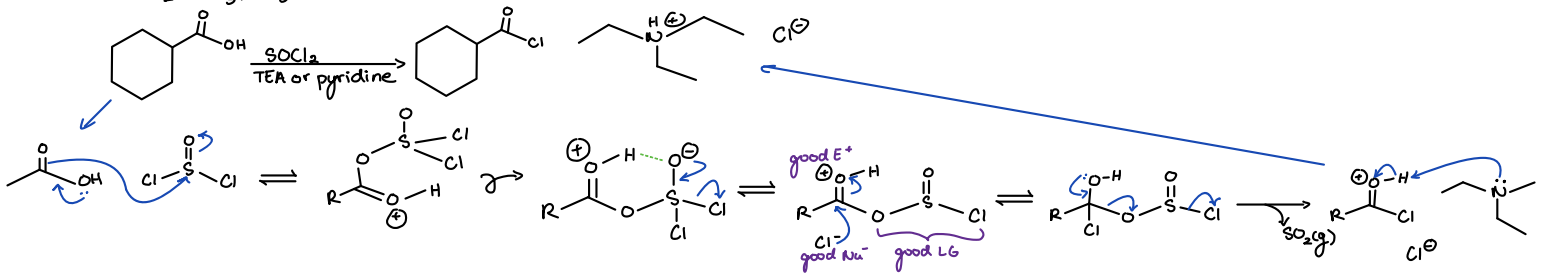
- hard to do NAS → basic Nu^- would undergo Acid-Base rxn first;
- Only works in Acid non-basic good Nu = good LG = reverse rxn



Forming Acyl Halide

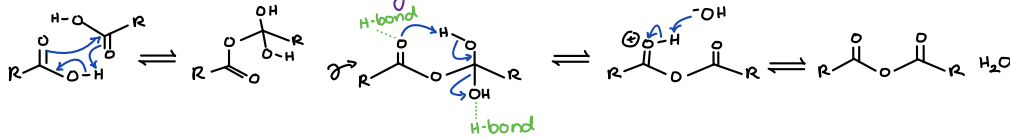
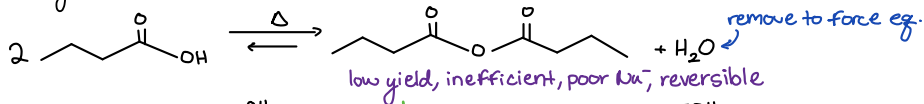
need to make OH a better LG
 ↳ hard to make a poor LG ok E⁺ into a good LG good E⁺ → Energetically unfavorable

↳ SOCl₂, PBr₃, PCl₅ w/ ROH → RX



Forming Anhydrides

- cyclic molecules → easier, 1 → 2 particles, ↑ ΔS



- H-bond network too much to draw
 ↳ simplify w/ charge + direct proton transfers

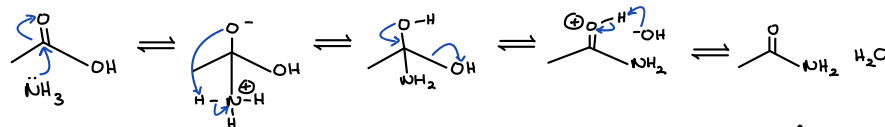
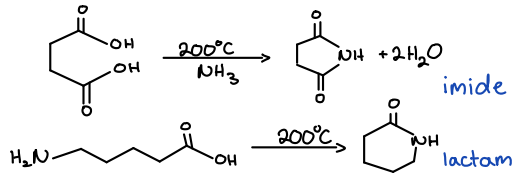
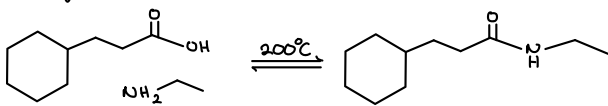
- if want complex anhydride use acyl halides

Forming Amides

↳ more likely to do acid-base rxn

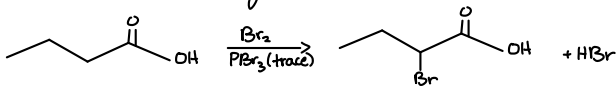
↳ enough heat will work, but not preferred method — don't use for synthesis

↳ reality — don't have split charges, H-bond network supports

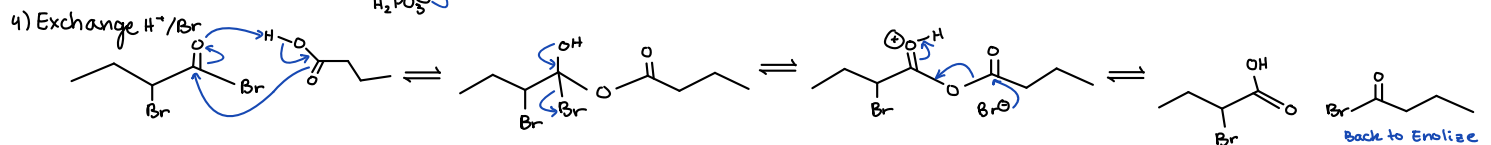
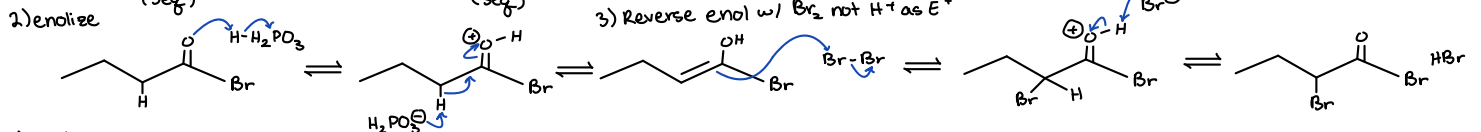
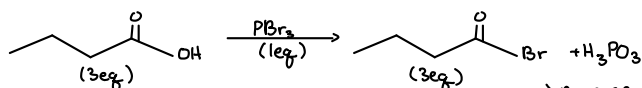


- use acyl halide or anhydride w/ TEA/pyridine for good yield

Hell-Volhard-Zelinsky (HVZ) → α-bromocarboxylic acids



1) Form small amt of acyl bromide (~10% acyl halide)



α -bromo Reactions

