Review Topics for Exam #3

Ch. 21
Nomenclature of carboxylic acid derivatives

Nucleophilic acyl substitution
  general mechanism
  vs nucleophilic add’n to carbonyl
relative reactivities
  general types of substitution
specific –olysis reactions

Useful new reactions:
  acid to acid chloride
  acid chloride to aldehyde
  acid chloride to ketone
  ester to aldehyde
  amide to amine
  1° amide to nitrile
  nitrile to 1° amine
  nitrile to aldehyde
  nitrile to ketone

General spectroscopy:
  IR: 1650 – 1850 cm\(^{-1}\)
  nitrile: 2250 cm\(^{-1}\)

Ch. 22
Keto-Enol tautomerism
  Mechanisms, factors affecting stability
  \(\alpha\)-substitution reactions of enols (as differentiated from enolates)
    halogenation
    Hell-Volhard-Zelinskii Reaction

Enolate formation
  Effect of base strength
  \(\alpha\)-substitution vs. carbonyl condensation

Alkylation of enolates

Reactions of stabilized enolates
  Malonic ester synthesis
  Acetoacetic ester synthesis
  Decarboxylation (mechanism, favorable conditions for occurrence)

Ch. 23
Aldol Reaction
  Mechanism, favorable reaction conditions
  Dehydration
  Mixed aldol
  Intramolecular aldol
  Use of aldol reaction to make more complex molecules

Claisen Condensation
  Mechanism, key deprotonation step
  Mixed Claisen
  Dieckmann Cyclization (favorable ring sizes, etc.)

Michael Reaction
  Mechanism
  What anions are favorable Michael donors?

Stork Enamine reaction
  Mechanism
  Use in Michael-type additions
  Alkylation of aldehydes

Robinson Annulation
  Mechanism (Michael + aldol)
  Recognition of Robinson product
  Use with conjugate addition