Study Guide for Exam 2

Chapters 19, 20, 21 and 25

- Carboxylic Acids
  - Nomenclature
  - Synthesis
    - Oxidation of Primary Alcohols
    - Oxidation of Arenes
    - Carbonation (addition of CO_2) to Grignard Reagents
    - Hydrolysis of Nitriles
  - Reactions
    - Reduction to Alcohols
    - Alpha-halogenation (X_2, P)
- Functional Derivatives of Carboxylic Acids (Acid Chlorides, Anhydrides, Amides, Esters)
  - Nomenclature
  - Synthesis
    - Acid Chlorides ($SOCl_2$, PCl_3, PCl_5)
    - Esters (from: Carboxylic acids, Acid chlorides, Anhydrides)
    - Amides (from: Acid Chlorides)
    - Esters (from: Carboxylic acids, Acid chlorides, Anhydrides)
      - Transesterification
  - Reactions
    - Acid Chlorides
      - Hydrolysis
      - Ammonolysis
      - Alcoholysis
      - Friedel-Craft Acylation
      - Coupling with Lithium Dialkycuprates
      - Reduction
    - Anhydrides
      - Hydrolysis
      - Ammonolysis
      - Alcoholysis
      - Friedel-Craft Acylation
    - Amides
      - Hydrolysis
    - Esters
      - Hydrolysis
      - Ammonolysis
      - Alcoholysis
      - Grignard Reagents
      - Reduction
      - Claisen Condensation
- Carbanions I (great Nucleophiles!)
  - Understand Nucleophilic Acyl Substitution vs. Nucleophilic Addition

Reactions

- Alpha-halogenation of Ketones
- Aldol Condensation
  - Related Reactions (KOH, $NaOCH_2CH_3$, NH_3(l), Perkin condensation)
- Crossed Aldol Condensation
- Claisen Condensation
- Crossed Claisen Condensation
- Coupling of Lithium Dialkyl Cuprates with Acid Chlorides
- Addition of Grignard Reagents
- Wittig reaction