

CHM 5226
ORGANIC REACTIONS
Fall 2002

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Office: 716 DLC
MWF, 9:05–9:55AM
213 HTL

Office Hours: MWF, 10–11AM, or walk-in

2 tests @ 150 points each, 1 final exam @ 200 points, plus homework

Homework: assigned whimsically. Please consider the problems at the end of each chapter worthy of your attention.

Textbooks:

Required: Carey and Sundberg, "Advanced Organic Chemistry", Part B, 4th Edition, 2001

Recommended: C&S "Advanced Organic Chemistry", Part A, 4th Edition, 2000

Smith and March, "March's Advanced Organic Chemistry", 5th Edition, 2001

Eliel, Wilen, and Mander "Stereochemistry of Organic Compounds"

Re-read your undergraduate organic textbook!

Molecular Models: You are not *required* to buy molecular models for this course *per se*, but you will need them eventually so you may as well get them now.

Course Objective: To provide you with the knowledge of general tactics in organic synthesis to allow future design and execution of synthetic strategies.

Topics: (associated reading assignments in **bold**)

1. Diels-Alder reaction (**C&S 6.1**)
 - a. Best reaction ever!
2. Review of basic principles and reactions (**C&S 3, 4.1–4.3, 4.8**)
 - a. Conformational analysis
 - b. Reaction mechanisms and reactivity
3. Oxidations (**C&S 4.4–4.7, 12**)
 - a. Oxidation of alcohols
 - b. Dihydroxylation of olefins
 - c. Epoxidation of olefins
 - d. Miscellaneous oxidations
 - e. C–H activation
4. Reductions (**C&S 4.9, 5**)
 - a. Hydrogenation and hydrogenolysis
 - b. Hydride reagents
 - c. Hydroboration of olefins
5. Reactions of carbonyls with nucleophiles (**C&S 7, 9, 2.3–2.7**)
 - a. Metallation reactions
 - b. Nucleophilic addition to carbonyls
 - c. Olefination of carbonyls

Test #1

6. Reactions of carbonyls with electrophiles(C&S 1, 2.1–2.2)
 - a. Formation of enolates
 - b. Enolate alkylation
 - c. Aldol reactions
 - d. Miscellaneous
7. Organometallic Chemistry (C&S 8)
 - a. Palladium-catalyzed coupling (and related procedures)
 - b. Olefin metathesis
 - c. Other important reactions
8. Carbocations, radicals, and carbenes (C&S 10, 11)
 - a. Cation- π cyclizations
 - b. Carbenes
 - c. Radical reactions
 - d. Aromatic substitution

Test #2

9. Pericyclic Reactions (C&S 6, see also C&S Part A, Chapter 11)
 - a. Electrocyclic reactions
 - b. Sigmatropic rearrangements
 - c. Cycloadditions
 - d. Ene and retro-ene reactions
10. Organocuprate conjugate additions
 - a. So they add 1,4... what else is new?

Final Exam