Chem 5580 Advanced Organic Chemistry I
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Office hours: Wednesday 12:30-1:30, Thursday 1:00-2:00 or by appointment

Recommended text: Carey, F. A., and Sundberg, R. J. *Advanced Organic Chemistry, Part B: Reactions and Synthesis*, 5th ed., ISBN: 978-0-387-68354-6.

Important dates
Problem Set 1 due, September 25
Midterm1, October 4
Minireview topic must be approved by me, October 11
Problem Set 2 due, October 25
Midterm 2, November 1
Minireview paper Due November 15th
Problem Set 3 due, Nov 29th
Oral Presentations Dec 6, 8
Final Exam, Dec 14, 7:30 A.M. L/L-D D107

Grading

2 Midterm Exams	40%
Cumulative Final Exam	30%
Problem Sets	5%
Special Topics Review Paper	20%
Oral Presentation	5%

Learning Objectives:

1. *be able to apply the fundamental concepts of reactivity to propose reasonable arrow pushing mechanisms for chemical reactions.*
2. *be able to list the chirality elements and apply that knowledge to identify stereochemical relationships between molecules that have a variety of chirality elements.*
3. *explain how different transition state energies affect reaction outcome and predict reaction outcome based on energy differences.*
4. *have learned a variety of functional group transformations and use this knowledge to plan synthetic routes to molecules of interest.*

Guidelines for writing mini-review.

Download and install ChemDraw if you have not yet done so. Always begin by assembling your ideas about a paper into figures so think about the information you want to convey in terms of figures and tables and generate the figures with Chem Draw. For formatting, in ChemDraw under files, click on “Apply Document Settings from” and then select ACS Document 1996. Generate your figures and tables and number your structures in the figures in bold. Once the structures have been generated, you can begin writing. Always refer to your structures and Figures in the text as shown in the example below.

The synthesis of the advanced intermediate **6** is shown in Figure 1. Robinson annulation of 2-methylcyclohexandione **1** with ethyl vinyl ketone catalyzed by MeONa afforded the conjugated enone **2** in 83% yield. Subsequent protection of the unconjugated ketone was accomplished with ethylene glycol and *p*-TsOH in benzene at reflux under Dean-Stark conditions to afford the ketal **3** in 75% yield. Dissolving metal reduction of the enone **3** afforded ketone **4** in 77% yield with the requisite trans ring junction. Kinetic enolization of ketone **4** with LDA and alkylation with Z-1-chloro-3-trimethylsilyl-2-butene afforded ketone **5** with equatorial alkylation in 84% yield. Epoxidation of the alkene **5** with mCPBA and subsequent epoxide opening and elimination to the ketone followed by intramolecular aldol afforded the enone **6** in 80% yield.

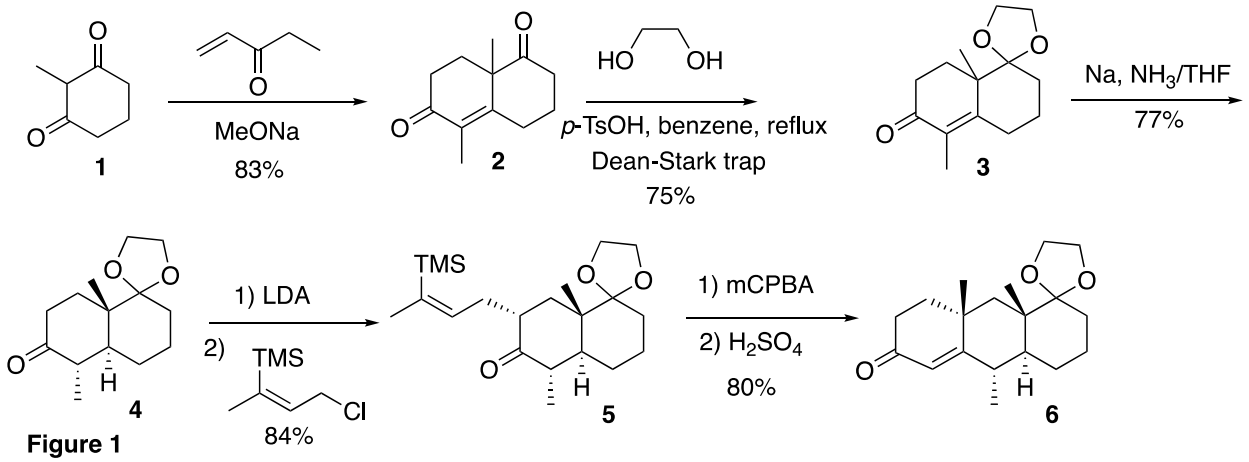

Figure 1

Length of the minireview should be around 13 pages double spaced including figures (not including references). The review should focus on no more than three papers from the recent literature that are focused on one specific area. For each paper you need to describe the work, what is important about the work, what is the innovation in the paper, etc.

Grading:
Content, focus, depth: 60%
Scientific writing 20%
Schemes, figure and tables 20%

References should follow ACS format (look at *J. Org. Chem.*) if you are not sure.

Oral presentation. The oral presentation will be a summary of the mini-review. You should plan for a 15 minute presentation.

Grading
Content: 50%
Presentation style: 50%

Academic Conduct:

Cheating or plagiarism will be considered grounds for failing the course (a numerical score of zero). All graded assignments must be your own work. Cases of cheating or plagiarism will lead to further disciplinary action, which may include dismissal from the University according to the rules set forth in the University of Vermont's Code of Academic Integrity:
http://www.uvm.edu/~uvmppg/ppg/student/acadintegrity.pdf

Stereochemistry

Conformational, steric and stereoelectronic effects

Basic mechanistic principles

Reactions of nucleophilic carbon

Reactions of nucleophilic carbon with carbonyl carbons

Concerted reactions

Electrophilic additions to carbon-carbon multiple bonds

***Religious Holidays**:*

Students have the right to practice the religion of their choice. *If you need to miss class to observe a religious holiday, please submit the dates of your absence to me in writing by the end of the second full week of classes.* You will be permitted to make up work within a mutually agreed-upon time.

Student Learning Accommodations:

In keeping with University policy, any student with a documented disability interested in utilizing accommodations should contact ACCESS, the office of Disability Services on campus. More information (including contact information) can be found online at www.uvm.edu/access. ACCESS works with students and faculty in an interactive process to explore reasonable and appropriate accommodations via an accommodation letter to faculty with recommended accommodations as early as possible each semester.