

**Department of Chemistry
University of Vermont**

Chemistry 42/44
Intro Organic Chemistry
Professor J. Madalenoitia
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Discovery W110

Spring, 19

Office hours:

| | |
|-----|-------------|
| Mon | 12:00-1:00 |
| Tue | 1:30-2:30 |
| Wed | 11:30-12:30 |
| Fr | 1:00-2:00 |

or by appointment

Text: Hart, Hadad, Craine, Hart; Organic Chemistry a Short Course 13th ed, Brooks/Cole.
Lab Manual.

This semester we will cover some of the foundational principles of organic chemistry including bonding, hybridization, resonance theory, isomerism, conformations of cyclic and acyclic alkanes, stereoisomerism, chirality, optical properties of stereoisomers, and implications for living organisms. In terms of functional group chemistry, the course covers, nomenclature, reactions of and ways to synthesize alkenes, alkynes, arenes, halo alkanes, alcohols, phenols, ethers, aldehydes, ketones, carboxylic acids, esters, amides, acid chlorides, anhydrides and amines as well as the corresponding mechanisms for these reactions.

Learning goals: 1) Understand how organic molecules react with organic and inorganic reagents through well-defined mechanisms and the three dimensional shapes of molecules, 2) make predictions for organic reactions.

Outline

Chapter 1. Bonding and isomerism.

Chapter 2. Alkanes and Cycloalkanes.

Chapter 3. Alkenes and Alkynes.

Chapter 4. Aromatic Compounds.

Chapter 5. Stereoisomerism.

Chapter 6. Organic Halogen Compounds.

Chapter 7. Alcohols Phenols and Thiols.

Chapter 8. Ethers and Epoxides.

Chapter 9. Aldehydes and Ketones.

Chapter 10. Carboxylic Acids and Derivatives.

Chapter 11. Amines and Related Nitrogen Compounds.

Exams and grading

Your course grade will be based on three examinations, a cumulative final examination, and your laboratory grade.

| | |
|------------------|-----|
| Lab | 20% |
| Exam 1 | 18% |
| Exam 2 | 18% |
| Exam 3 | 18% |
| Online homework | 6% |
| Cumulative Final | 20% |

Review Session Dates:

| | |
|------------|---------------------|
| February 6 | 6:40 P.M.-7:40 P.M. |
| March 6 | 6:40 P.M.-7:40 P.M. |
| April 17 | 6:40 P.M.-7:40 P.M. |

Midterm Dates:

| | |
|-------------|---------------------|
| February 13 | 6:40 P.M.-8:40 P.M. |
| March 20 | 6:40 P.M.-8:40 P.M. |
| April 24 | 6:40 P.M.-8:40 P.M. |

Review and Midterm Exam Location:

Fleming 101

Final Exam Date:

Thursday May 9 7:30 A.M.-10:15 A.M.

Final Exam Location:

Votey 105

No exam grades are dropped. However, if you score higher on your final exam than your lowest exam grade, I will drop your lowest exam score and replace it with the final exam score. The only valid excuses for missing an exam are medical or other true emergency situations. If you miss an exam for such a reason, you must inform me of it promptly, present appropriate documentation of your excuse, and receive formal approval

to take a make up exam. If you miss an exam for any other reason, you will receive a grade of zero for that exam. There will be only one make-up exam given during the semester; it will be scheduled at the end of the semester, and it will be cumulative.

If you have any questions concerning the grading of an exam, you must see me within one week after the day the exam is returned to the class. After that time period has passed, I will make no grade changes for the exam.

Online Homework:

1. Go to <http://saplinglearning.com> and click on your country ("US Higher Ed") at the top right.
2. a. If you already have a Sapling Learning account, log in and skip to step 3. b. If you have a Facebook account, you can use it to quickly create a Sapling Learning account. Click "Create an Account," and then "Create my account through Facebook." You will be prompted to log into Facebook if you are not already logged in. Choose a username and password, then click "Link Account." You can then skip to step 3. c. Otherwise, click "Create an Account." Supply the requested information and click "Create My Account." Check your email (and spam filter) for a message from Sapling Learning and click on the link provided in that email.
3. Find your course in the list (listed by subject, term, and instructor) and click the link.
4. Select a payment option (\$42 for student access) and follow the remaining instructions. The \$42 fee covers the online homework.
 - Once you have registered and enrolled, you can log in at any time to complete or review your homework assignments.
 - During sign up - and throughout the term - if you have any technical problems or grading issues, send an email to support@saplinglearning.com explaining the issue. The Sapling support team is almost always more able (and faster) to resolve issues than your instructor and TAs.
 - To optimize your Sapling Learning experience, please keep your internet browser and Flash player up to date and minimize the use of RAM-intensive programs/websites while using Sapling Learning.

Laboratory Schedule

| Date | Exp# | Title |
|-----------|------|---|
| 1/28-1/31 | 1 | Determination of alcohol content of wine by fractional distillation |
| 2/4-2/7 | 2 | Molecular models |
| 2/11-2/14 | 3 | Analysis of common analgesics by thin layer chromatography |
| 2/18-2/21 | | Off for Presidents Day |
| 2/25-2/28 | 4 | Extraction of an antibiotic |
| 3/4-3/7 | | Off for town meeting day |
| 3/11-3/14 | | Off for Spring Recess |
| 3/18-3/21 | 5 | Extraction and recrystallization |
| 3/25-3/28 | 6 | Synthesis of 1-bromobutane |
| 4/1-4/4 | 7 | Alkenes by acid catalyzed dehydration of an alcohol |
| 4/8-4/11 | 8 | Oxidation of an alcohol |
| 4/15-4/18 | 9 | Production of biodiesel |
| 4/22-4/25 | 10 | Polymers and Check Out |

Grading for the Laboratory:

As described in the Lab Manual (available on Blackboard)

Laboratory Safety:

The organic laboratory is a very safe place to work if safety precautions are always observed. Caution, as well as careful thought and knowledge of the characteristics of what one is working with are necessary to avoid accidents and injuries. Potentially hazardous apparatus and flammable, toxic, and/or corrosive chemicals are sometimes used. The following rules and procedures will be observed at all times.

Rules:

1. You must wear safety goggles or OSHA approved glasses in the laboratory. Do not wear contact lenses.

2. Avoid personal contact with chemicals. Many chemicals have an adverse physiological effect (e.g. narcosis, toxicity, allergenicity, etc.). It is best to wear protective gloves. If you spill any chemical on your skin, wash it off at once with soap and water and tell your TA. Do not inhale chemicals or put them in your mouth.
3. Performance of unauthorized experiments is not allowed.
4. Horseplay in the laboratory is strictly forbidden.
5. Drinking, eating, or smoking in the laboratory is prohibited.
6. Removal of chemicals and equipment from the laboratory is forbidden.
7. Report all accidents and injuries, however minor, to the instructor.
8. Extraneous sources of sound are not allowed.
9. Do not work in the laboratory while under the influence of drugs or alcohol.
10. Dress properly. Do not wear open shoes or sandals. Do not wear baggy clothes. Long hair must be tied back.
11. Do not pipette by mouth.
12. When leaving the laboratory make sure all gas, air, water, steam, and electricity are turned off.
13. Know the location of exits, safety showers and eye-wash fountains.
14. Protect your hands with gloves or a towel when pushing glass tubing or thermometers into stoppers or rubber tubing. Lubricate the hole.
15. The working space, drawers, cabinet, and shelf above your bench should be neat and clean at all times.
16. The balances and balance area should be cleaned of any chemical spill.
17. Put glass in the broken glass disposal box; not in the trash.
18. Always point test tubes, flasks, and separatory funnels away from you or other passers by.
19. Follow the instructions in you laboratory text for proper waste disposal.

In case of accident

1. Fire. Personal safety is most important. Make sure everyone gets out of the room and the building. After the safety of all is assured, you may extinguish the fire. If a person's clothing catches fire, he or she needs help. Prevent the person from running. Put him or her under the safety shower and pull the chain. (It is less effective to smother flames with a fire blanket. Never spray a person with a carbon dioxide fire extinguisher.

2. Chemicals. If corrosive chemicals are spilled on clothing, immediate showering with the clothes on is the best remedy. If chemicals are spilled on the skin, wash them off with large volumes of water. If the chemical is spilled in the eyes, it should be washed immediately at the eye wash fountain.

3. Injuries. All injuries, no matter how minor must be treated immediately by competent medical staff at the University infirmary. Report the injury to your lab instructor.

You must take the lab safety quiz on blackboard and score 80% or better before starting lab.