

Chemistry 2330 Organic Chemistry Lab I Fall Semester, 2005

Professor in Charge: Vernon D. Parker, W 345, 797-1697, vparker@cc.usu.edu
Office hours: M, T, R from 1:30 – 2:30

Teaching Assistants:

In accordance with the Americans with Disabilities Act, reasonable accommodation will be made for all persons with disabilities in order to assure equal participation in Chem 2330. Please meet with your Teaching Assistant and Dr. Parker during the first week of labs to make arrangements.

Lab Fee (required): \$45.00 used for the purchase of equipment and supplies for the lab.

LabText: Chemistry 2330 Laboratory Manual, Techniques in Organic Chemistry by Mohrig, Hammond, Schatz, and Morrill (W. H. Freeman and Company, 2003)

Notebook: Student Lab Notebook (Hayden McNeil Specialty Products) USU Bookstore

Safety: Eye protection (glasses or safety goggles - no contact lenses) and appropriate shoes are required at all times in the Lab. Safety goggles may be purchased in Chem Stores in the basement of Maeser. No eating and drinking is allowed in the Lab. All waste chemicals must be placed in proper containers (usually in the hood). Report all spills or accidents to your TA immediately for assistance. A Lab coat or apron, other expendable clothing is a good idea. Don't wear your best clothing to lab.

Grading: Grades will be based on lab reports, evaluation of your lab notebook, quizzes, and evaluation by your TA.

Lab reports (10 x 40 pts)	400
Lab notebooks (10 x 20 pts)	200
Pre-lab quizzes (4 x 25 pts each)	100
Evaluation (safety, cooperation, independence)	<u>100</u>
	800 (total)

Lab reports: These are to be 1 - 2 page computer drafted documents. They must include the title of the experiment and a brief description (~ 50 words), a summary of the experimental procedures and results, all data collected and all calculations performed, and a concluding statement (what was learned from the results?). In addition you will be assigned several problems or questions which are to be answered at the end of report. Late reports will be penalized by 10% if not handed in on time and an additional 10% penalty for each week after that.

Lab notebooks: Before leaving the laboratory at the end of a lab period you must hand in the duplicate copy of your notebook pages including the data you gathered and the observations you made during the experiment.

Pre-lab quizzes: Four quizzes will be given during the semester at the beginning of lab. These quizzes may cover any material from the reading assignment for the preceding experiment or the current one. Reading assignment for each lab session are given on the class schedule below.

Evaluation: You will be evaluated by your TA on your preparedness, your adherence to safety rules, your cooperativeness, and your ability to work efficiently.

A grade of 90% is guaranteed a letter grade of A- and 95% an A.

Make-up policy: Students who miss an experiment and furnish a valid excuse to the instructor may attend another section in the same week if space is available. The student must contact the TA of the section for the make-up lab before starting the experiment. Missing the second experiment will result in a grade of zero for that lab. Students missing more than two labs will receive a grade of F for the course.

The Laboratory Notebook

A lab notebook is a permanent record of experiments carried out in the laboratory. Everyone who may be occupied in the scientific research must learn to keep a proper record of their experimental conditions and observations. In industrial laboratories this is of such importance that notebook pages are signed by the researcher and by a colleague who serves as a witness. The notebook serves as a legal document to establish claims of discovery.

Your TA will be continually evaluating your notebook usage, both in the manner in which you enter data in the lab and in the copies which you hand in at the end of each lab period. The following guidelines should be followed:

- 1) All entries must be in ink. NO PENCIL!
- 2) Each notebook page must be dated as it is used.
- 3) Notebook entries must not be erased or obliterated. Cross out erroneous entries with a single line and make the correct entry nearby.
- 4) Data must be entered into your notebook directly as you gather it. Using scraps of paper for any records for later transfer to your notebook is unacceptable.

General format: Before you come to the laboratory you should enter the following into your notebook to help you prepare for the experiment (and for a possible quiz!).

- 1) The top of the first notebook page for each experiment should contain the title of the experiment. This should be followed by a brief statement of the purpose.
- 2) Write balanced chemical equations showing the overall process you will perform.
- 3) Write an experimental outline in sufficient detail so that you could do the experiment without referring to the textbook. One possible format for this is to draw a vertical line down the center of the page and write the experimental outline on the left side of the page and then enter your observations at different points of the experiment on the right side.

Your TA will give you other specifics about how your notebook should be organized and maintained.

Chemistry 2330 (Fall 2005) - Experiments

<u>Lab Week</u>	<u>Activities</u>	<u>Lab Manual</u>	<u>Time Period</u>
1	Check-In, Safety Discussion Fermentation of Sucrose	Introduction: 1.1 - 1.7 (pp. 1-11) Technique: 1.1 - 2.4 (pp. 689-714) Experiment 3	9/6-9/12 Tu-Mon
2	Distillation of Ethanol	Technique: 1.1 - 2.4 (777-795)	9/13-9/19 Tu-Mon
3	Extraction of Caffeine from Tea	Experiment 1 Technique: 4.2 - 4.4 (pp. 728-734) Technique: 4.6 - 4.8 (pp. 742-744) Technique: 5 (pp. 749-765) Note Fig. 5.4	9/20-9/26 Tu-Mon
4	Synthesis of Salicylic Acid	Experiment 4 Technique: 3.1 (pp. 714-715) Technique: 3.3 (pp. 719-723) Technique: 5.3 (pp. 754-759) Technique: 6.3 (pp. 771-773)	9/27-10/3 Tu-Mon
5	Synthesis of Aspirin	Experiment 5 Technique: 5.2a (p. 753) Technique: 5.3 (754-759) Technique: 6.3 (pp. 771-773)	10/4-10/10 Tu-Mon
6	Synthesis of Isopentyl Acetate	Experiment 25, 25.1 Technique: 3.3 (pp. 719-723) Technique: 4.2 (pp. 728-730) Technique: 7.3 (pp. 783-787)	10/11-10/17 Tu-Mon
7	Completion of Experiment 25	Technique: 11, 11.1 (pp. 826-828)	10/18-10/24 Tu-Mon
8	Dehydration of 2-Methylcyclohexanol	Experiment 11, 11.2 and handout Technique: 4.6 (pp. 742-744) Technique: 7.4 (pp. 791-794) Technique: 11.1 - 11.6 (pp. 827-840)	10/25-10/31 Tu-Mon
9	Synthesis and chemiluminescence of Luminol	Handout	11/1-11/7 Mon-Th
10	Thin-Layer Chromatography of Caffeine, Aspirin, and commercial Analgesics	Experiment 5 (pp. 47-48) Experiment 2 (pp. 22-27) Technique: 10.1 - 10.6 (pp. 815-825)	11/8-11/14 Tu-Mon
11	Stereochemistry of Br ₂ Addition to trans-Cinnamic Acid	Experiment 9, 9.3 Technique: 3.3 (pp. 719-720) Technique: 5.2a (pp. 753-754) Technique: 5.5 (pp. 759-763)	11/15-11/21 Tu-Mon
12	Grignard Synthesis	Experiment 13, 13.1b or 13.1c Technique: 4.2 (pp. 728-730) Technique: 5.3 (pp. 754-759)	11/28-12/2 Mon-Fri
13	Checkout and Course Evaluation		12/5-12/8 Mon-Th