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*Text:* *Organic Chemistry Laboratory*, 3<sup>rd</sup> Edition, Bell, Taber and Clark, Thomson Brooks/Cole, 2001. ISBN: 0-03-029272-2  
*Laboratory:* F 1:30 – 4:20 pm, Mendel 385

*Contents:*

This class will involve the synthesis, isolation, purification, and characterization of a variety of organic molecules. The laboratory is designed to reinforce concepts from CHM 2212 and to allow you to learn the basic techniques and skills employed by practicing organic chemists.

*General Policies:*

1. Students will generally work in pairs for experiments.
2. Students must come to the laboratory *prepared*; this includes reading the appropriate sections of the laboratory textbook and completing the prelab assignment. This is imperative for completion of the experiments in a timely fashion and for safety reasons.
3. Safety instructions and other procedures will be discussed at the beginning of the lab period, therefore it is very important to *be prepared and on time*.
4. Safety must be everyone's first priority in the laboratory. Students will be dismissed from the laboratory and assigned a zero for the lab period for *any* infraction of the safety regulations.
5. Students must wear mono-goggle safety glasses at all times.
6. Common sense and consideration of fellow workers must be exercised rigorously and constantly. This includes proper disposal of chemical waste and keeping the laboratory clean. This will be an important part of your technique grade.

*Please refer to the following pages for information on grading, laboratory notebook requirements, and a schedule of experiments for the semester.*

**Syllabus**  
**Organic Chemistry Lab II**  
**Spring 2007**

Text: Organic Chemistry Laboratory, 3<sup>rd</sup> Ed, Bell, Clark, Taber

Academic Honesty: The university policy is described in the "Student Guide" -- Make it easy, don't even think about cheating.

Grading: Your evaluation will be based on the following approximate emphasis:

Lab Notebooks	50%
Quizzes	30%
Technique and Products	20% <sup>1</sup>

The actual emphasis may vary slightly from the above grading scheme.

Attendance is required. There are no make-up labs. If you must miss a lab, please let me or the TA's know as soon as possible. For an absence to be considered excused, you must have a written excuse. An unexcused absence will result in a mark of "zero" for lab notebook, quiz, etc. If you miss more than 2 labs you will not be able to complete the course (or get an incomplete).

The textbook has reading sections associated with the labs listed below. These reading sections in the lab manual are assigned. The quizzes might have questions that are based on the reading assignments in the lab text.

Prior preparation is the key to effective and efficient performance in the lab.

1. Technique Grades are based on:

- Preparation for lab
- Observance of safety guidelines
- Effort, proficiency, and neatness in setting up equipment, carrying our experiments, collecting data, and keeping up to date lab records
- Mastery of new lab techniques

## LABORATORY NOTEBOOK REQUIREMENTS\*

Students frequently ask just how detailed should their laboratory notebook be kept. I think the following is the answer:

*Notebook write-ups should contain enough information so that another person with a basic knowledge of chemistry could repeat the experiments from the information you provide.*

All write-ups must be placed in a Villanova University Chemistry Department Lab Notebook, available in the Bookstore. Use a ball point pen for writing, and place all information directly in the notebook as it is obtained. Leave two pages at the beginning for a Table of Contents. It is important that you write legibly. However, since some writing must be done in the laboratory, you will not be expected to provide polished, formal reports. Note that only the tear-out copies from the notebook are to be handed in for marking. The original copies are to remain in your possession.

Each experimental write-up will consist of three parts:

- A. a **pre-lab write-up**, which you must complete before lab and hand in to your TA upon entering the lab.
- B. your **observations**, recorded in lab and
- C. your **conclusions**, which you complete during or after lab (as directed).

### The Pre-lab Write-up:

On entering the lab, you must present the **notebook copy** of your pre-lab write-up for that day to your TA. The purpose of the write-up is to demonstrate reasonable preparation for, and knowledge of the experiment to be conducted. If you do not demonstrate such knowledge, either written and/or orally, you will not be allowed to carry out the experiment. It is imperative that you complete the reading assignments and compose your own pre-lab reports. **It is unethical to copy pre-labs, and other parts of your lab reports from other persons or sources. It is also a violation of the Code of Academic Integrity of the College of Liberal Arts and Sciences.**

The pre-lab write-up should include:

- A. **Your Name, Course and Section No., and Date** (upper right hand corner of page).
- B. **Title of the Experiment.**
- C. **Statement of Purpose** of the experiment (a sentence or so, regarding the techniques or principles which the experiment demonstrates).
- D. **Reaction Sequence** (where applicable). Reactions should be written in standard manner with solvent and temperature information over the reaction arrows, and the stoichiometry clearly indicated. Individual steps of multistep processes are to be included.
- E. **Table of Physical Constants** of reagents to be used in the experiment. Information for completing the table may be found in the lab text, in the CRC handbook, or in an Aldrich Catalog.
- F. **Procedure.** The procedure indicated in the lab text and/or from a handout should be recorded in outline format. This step-by-step outline should include all information requisite for conducting the experiment, such as procedures, amounts of chemicals or solvents to use, reaction times and temperatures, and other important considerations (such as "until the color fades", or "1.0 M sodium hydroxide was added with stirring, to pH 9.0"). Be sure to leave space between steps in your procedure for writing in last minute changes.

**Observations** (to be recorded in lab):

Write what you are doing as you do it! Exact amounts of all reagents, crude and purified products must be recorded in order to calculate yields accurately. Record all chemical and physical changes. Data is often recorded in tabular form (such as the boiling point of a distillate obtained as a function of volume). Graphical presentation of data will also be used in certain cases. Digital or graphical data obtained as output from various instruments such as IR spectra or GC traces should be attached to your lab reports. Notebook pages containing your observations must be initialed and dated by your professor or TA before you leave lab for the day.

**Conclusions** In this section of your write-up, include:

- A. Results, such as % yields (show calculations) and comparisons between literature values for yields, m.p.'s and b.p.'s, chromatographic, etc., data with those which you obtained.
- B. Your interpretation of results which you consider to be unusual, or are not in agreement with those indicated in the text or by the instructor. You should focus especially on how errors might have contributed to the outcome.
- C. Your evaluation of the experiment, and a brief summary of how you might improve your procedure if you were to performed it again.
- D. Answers to assigned post-lab questions (if any).

