

Organic Chemistry Laboratory 1
CHE 310L-012
Spring 2007

Instructor: Dr. Bradley Sieve

Time Wed 2-5:00 PM

Place: SC 461

Office: SC 452

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Phone: ext 6547

Office Hours: TBA

Outside office hours I have an open door policy, meaning feel free to approach me in my office at anytime. Though if possible make appointments outside posted hours to insure availability.

“Learning organic chemistry through experiments and connecting these lessons to your class work.”

Students will

- understand and exhibit proficiency with basic modern experimental techniques
- utilize published chemical literature and methods as reference material as well as developing independent approaches to problems
- Connect concepts of standard mechanisms to experimental approaches and rational

Prerequisite: CHE 121 with a C or better and CHE121L with a C or better

Co-requisite: CHE 310 ****If a student withdraws from the 310 lecture at any time, he / she must also withdraw from the lab****

Text:

"Techniques in Organic Chemistry", second edition, Jerry R. Mohrig

Organic Chemistry I Laboratory Experiments Supplemental, Online Site

(<http://www.nku.edu/~chemistry/che310l.html>)

Required supplies:

Laboratory Notebook that makes copies (from bookstore)

Safety Goggles with side shields

A **nonprogrammable** scientific calculator (programmable calculators will not be allowed to be used during quizzes and exams, also no passing of calculators will be allowed)

Preparation: Students are to come to lab with a thorough understanding of the principles involved in the experiment, the goals of the experiment, and the procedures to be followed. The laboratory notebook must contain a completed protocol for each experiment, as specified in the lab supplement, prior to entering the lab. This protocol may be reviewed by the professor prior to beginning the experiment if not completed you will not be allowed to complete the lab. **No text book or supplement will be used or present in the lab hood during the laboratory period. Also all physical constants such as m.p., b.p., and densities must be found before lab.**

LAB REPORTS ARE DUE AT THE VERY BEGINNING OF THE NEXT LAB PERIOD. If you need help with the lab report, I am happy to assist you if you come to me prior to the lab class in which the report is due. Do not wait until the last minute to do your lab report. I will not give any assistance if you ask on the day that the report is due as that would be unfair to the students who have turned in their report on time.

Tentative Grading Scheme

Melting Pt./Molec. modeling (2x)	25 pts.
All other experiments (10x)	50 pts. each
4 pre-lab quizzes	10 pts. each
Midterm exam	100 pts.
Final exam	<u>125 pts.</u>
Total Points	815 pts.

According to the point system above, reports represent 67% of your grade. The four unannounced quizzes will be 5% of your grade. The exams will be worth 28% of your final grade.

Grading Scale	Total Points Needed
90 - 100 % A	734-815
80 - 89 % B	652-733
70 - 79 % C	571-651
60 - 69 % D	489-570
0 - 59 % F	< 488

Break-Down of Experiment Grading

Record Book	10 pts
Yield and Purity	15 pts.
Calculations and Questions	15 pts.
Conclusions	10 pts.

These values will vary some with each experiment. The points will be halved for the 25 point labs.

At the end of the term the lowest score received for a 50 pt. lab will be removed giving the final 10 scored 50 point lab sessions. No make-ups will be allowed for the exams and absence will result in a zero for that score.

Preparation for class: Each week you must come to class having thoroughly read and understood the experiment that you will perform that day. To ensure that you are prepared, a pre-lab quiz worth 10 points may be given at the start of the period. If you are more than 30 minutes late to class you will not be allowed to complete the lab for that week. **If you are late for lab or miss that lab you MAY NOT make-up the quiz under any circumstances!!!!**

Attendance: There are no make-up labs for any reason. If a lab experiment is missed a grade of zero will be assigned for that lab. Failure to attend 11 of the 13 laboratory sessions will result in a failure for the semester. One lab will be removed from the scoring though at the end of the term with the lowest score which may be a zero received for absence.

Everything that you do MUST be done in your lab notebook. You don't need to print out the data sheets that go with each lab as I do NOT require that you turn them in.

The above sections will be graded on neatness, content, readability, and spelling. Each section of the notebook should be labeled and in the following order: Title, purpose, chemical reaction equation (with physical data listed under each chemical), protocol (written in the left side column), data and observations(written in the right side column), calculations, conclusions

Data and observations should consist of the ACTUAL amounts reagents that are used by the student, as well as anything that you see, hear, or smell (that is related to your experiment) while doing the lab. The color and physical states of reagents, intermediates and products should also be noted. The data section should contain the actual amounts of reagents / products used or obtained in the experiment. It is not sufficient to list the theoretical amounts of reagents needed in the protocol section and to assume that this was in fact the exact amount of a reagent that you actually used. If, for example, the protocol says to use 1.0g and you did in fact weigh out exactly 1.0g, then write 1.0g in the data section as well though this will be a very rare occurrence. The data and observations must be initialed the instructor when the experiment is completed. Before leaving the lab, your top copy notebook pages containing the protocol through data and observations should be turned in to the instructor. All work must be recorded in pen and any mistakes written in the notebook should be crossed out with a single line, not a big scribble cloud.

Calculations, with all the work (formulas used) shown as well as the conclusion section should be done in the lab notebook also. These calculations will show each step not simply the end results how you got the answers is just as important as the final answer. Points will be deducted if only the answer appears. If any instrumental analysis is done a data table of results should be included in the notebook.

The conclusion section should be done in paragraph form and should contain the following information. State the purpose of the experiment (why did we have you do the experiment) and whether or not it was achieved. A general statement of the techniques and/or type of reaction done. Names of starting materials and product(s). List any important results or findings, such as % recovery or the proof of identity and purity of an unknown. Give an interpretation of the results including any instrumental analysis information. Lastly, discuss any meaningful sources of error and how they influenced your results.

Formal lab reports should be written in the form of the template at the end of the syllabus.

Late assignments may be reduced up to 5 points per school day.

Additional safety rule. There will be no shorts or other clothing in which the legs are bare. Open toe shoes are also forbidden. Anyone who arrives in the forbidden garb will not be allowed to enter lab and will take a zero for that lab.

Honor Code: Students are expected to conform to the Student Honor Code (<http://www.nku.edu/~deanstudents/HonorCode.htm>). Academic dishonesty in this class will result in dismissal from the class and an F in the course.

Students with disabilities who require accommodations (academic adjustments, auxiliary aids or services) for this course must register with the Disability Services Office. Please contact the Disability Service Office immediately in the University Center, Suite 320 or call 859-572-6373 for more information. Verification of your disability is required in the Disability Services Office for you to receive reasonable academic accommodations. Visit the Disability Services website at www.nku.edu/~disability/.

This syllabus is subject to change, though any change will be announced.

No cell phones or pagers will ring or be used in the classroom.

Tentative Schedule, Spring 2007

Jan. 9 Check in and Melting Points
Jan. 16 Recrystallization of Benzoic Acid
Jan 23 Recrystallization and Identification of an Unknown (*Formal Report*)
Feb 6 Extraction
Feb 13 Thin Layer Chromatography (TLC) Analysis
Feb 20 Compound Identification by NMR
Feb 27 **TEST 1** Melting point through TLC
Mar 6 Spring Break (No Lab)
Mar 13 Column Chromatography
Mar 20 Molecular Modeling
Mar 27 Sn1 Reaction: Conversion of t-Amyl Alcohol to t-Amyl Chloride (*Formal Report*)
Apr 3 Stereochemistry: Addition of Bromine to Cinnamic Acid
Apr 10 Carbocation Rearrangement (*Formal Report*)
Apr 17 Elimination Reaction with 2,3-Dibromo-3-phenylpropanoic Acid

The Laboratory Notebook

One of the objectives of this course is for you to learn how to enter and maintain data in the lab book. Think of the lab notebook as the permanent record of your work in the lab. Because of this certain rules are always followed in lab books. Use these guidelines along with the write-up on page 31 of the lab book.

- 1) All entries are to be made in pen and directly in the lab book.
- 2) No loose leaf pages should ever be written on. At the same time all record/calculations should be written directly in the lab notebook.
- 3) All information should either be written or attached to the notebook (graphs etc.. should be stapled in the book)
- 4) All Calculations should be done in ink in the lab book.
- 5) There should be at no time "white-out" or similar items in the lab notebook
- 6) Corrections should be completed by a single line through the error and the correct words/numbers written directly next to the x-outs.

Following these instructions will lead to a less than pristine lab notebook, that is perfectly fine and simply shows that the lab notebook was used correctly.

A lab notebook should show the train of thought and original ideas not simply be a collection of final answers.