

Advanced Laboratory III Spring 2007

CHEM 4913W

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Office Hours: MWF: 8:30-10 AM & 2:30-3:30 PM; T: 9:00 – 11:00 AM

Office Hours: MW9:30-11&1-2, F9:30-11:30&1-5

Office Hours: TBA

Course Material:

Permanent Bound Laboratory Notebook (not spiral-bound)

Safety Glasses must be worn at all times while in the laboratory and can be purchased from the Chemistry Department.

Learning Outcomes: Apply technical writing skills to express experimental findings, interpret and derive meaningful results from measured data and demonstrate knowledge of synthetic & physical methodologies.

Description: Involves non-trivial synthesis of organic and inorganic molecules by a variety of techniques. Spectroscopic (FT-NMR, IR, UV, etc.) and computational methods will be used to investigate, characterize, and compare experimental and theoretical properties of the synthesized molecules. Special emphasis will be placed on writing skills.

Tardiness / Missed Lab: Lab attendance is mandatory. At the beginning of each laboratory we will discuss theory and principles related to the laboratory.

Policies: Read all laboratory material before coming to lab. You are responsible for the cleanliness of the laboratory. Borrowed equipment or chemicals should be returned and waste disposed of properly. Special care should be made to keep the area around the balances free of spills. You must clean up after yourself.

Academic Misconduct: Honesty in reporting results is one of the essential characteristics of your laboratory work. Little of your grade depends on getting "good" quantitative results. You will be more severely penalized for misrepresenting results than for honestly reporting "poor" results. Copying lab reports (any part) shall be considered academic misconduct and as a result, will be penalized to the fullest extent possible.

WAC Course: This course has been designated as a Writing Across the Curriculum course. The writing components of this course are designed to help you to understand and communicate the science involved in your lab experiments. As a WAC course, a variety of informal and formal writing assignments are required which are intended to stimulate "writing to learn" (WTL) as well as "writing to communicate" (WTC). This will entail daily writing in your laboratory notebook, laboratory reports, a pre-proposal, proposal and a final report on your synthesis project. Your laboratory reports, proposal, and final report will be edited and may require several rewrites to improve your writing of scientific papers. The Writing Center can assist you with your writing assignments or projects. It is located in the Perkman Room, TLC 1201. Their phone number is 96513, and their web address is www.westga.edu/~writing.

Grades

Lab Notebook (written entries of all experiments)

30%

Lab Reports

70%

Grading Scale: 90-100 A, 80-89 B, 70-79 C, 60-69 D, <59 F

LABORATORY SCHEDULE: Tuesdays and Thursdays, 2:00pm-5:00pm. Due to the variable and unpredictable time required by some of the synthetic experiments, the lab schedule will vary around the schedules of each student.

Lab Notebook

You are expected to keep an up-to-date hand-written record of all experiments you will perform. Include a date, reaction scheme, detailed procedure (written in the past tense and in the third person), physical and spectral data for each experiment. All records must be entered directly into the notebook in non-erasable ink. Your lab notebook will be collected at the end of the semester.

Reports

You will be given a basic outline of each experiment or project and specific goals to achieve. After completion of each project, you are expected to write a comprehensive report including the following sections.

Title: This should clearly state the main objective of the experiment or project.

Objective(s): Outline the objectives of the experiment or project.

Introduction: Outline how the experiment will achieve the objectives.

Reaction Equation(s) and Mechanism(s): If the experiment involved chemical reactions draw out the reaction equation(s) using ChemDraw, the chemical structure drawing program. Draw reaction mechanisms when appropriate.

Table of Reagents/Products: Tabulate the chemicals and their relevant information (name, formula, formula mass, density if liquid, concentration if solution, mass used, moles used, mole ratio of reactants, theoretical yield of important product(s), actual and % yields, etc).

Experimental Procedure: Write a detailed procedure for the experiments you performed (write in the past tense, passive voice and in the third person). Also in this section, document all your physical and spectral data in detail using the American Chemical Society approved format. Each compound made should have an IUPAC name. The accepted style for writing experimental procedures and reporting physical and spectral data can be obtained from any ACS journal such as Journal of the American Chemical Society or Journal of Organic Chemistry (both are available in the library).

Results: Summarize the results (yields, physical properties, spectroscopic data, etc).

Discussion: State what you accomplished, what problems you encountered and how you overcame them. Discuss **briefly** the experimental procedures and methods you used to purify the products from your reactions, and the spectral data you obtained and how they were used to identify your products or draw conclusions. If the compounds are known, compare the physical and spectral data with published values.

Conclusion: Briefly summarize the project and the outcome.

References: List all relevant literature citations. It is recommended to use the endnote/cross-reference functions on Word.

The report should be submitted within a week of completing the project.

Schedule

<i>Week</i>	<i>Dates</i>	<i>Instructor</i>	
1	1/9-1/11		No class
2	1/16-1/18		Thursday -Syllabus and Introduction (2pm, TLC3104)
3	1/23-1/25	Dr. Slattery	Siloxane Polymer chemistry
4	1/30-2/1	Dr. Slattery	Siloxane Polymer chemistry
5	2/6-2/8	Dr. Slattery	Organic Polymer chemistry
6	2/13-15	Dr. Slattery	Organic Polymer chemistry
7	2/20-2/22	Dr. Fujita	Spectrochemical Series
8	2/27/3/1	Dr. Fujita	Spectrochemical Series/Metal Hydride Complex
9	3/6-3/8	Dr. Fujita	Metal Hydride Complex
10	3/13-3/15	Dr. Fujita	Metal Carbonyl Complexes
11	3/19-3/22		Spring Break (no class)
	3/27-3/29	Dr. Ray	Advanced Organic Synthesis
12	4/3-4/5	Dr. Ray	Advanced Organic Synthesis
13	4/10-4/12	Dr. Ray	Advanced Organic Synthesis
14	4/17-19	Dr. Ray	Advanced Organic Synthesis
15	4/24-26		Turn in the notebook, cleaning and check out