Chem 227
Organic Chemistry Laboratory II
Spring 2005

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CATALOG DESCRIPTION: Chem 227. Organic Chemistry Laboratory II. 2-0-6. Prerequisite: Chem 226. Advanced study of the properties, preparation, indentification, and literature of organic compounds. (40.0504)

PREREQUISITES: Chem 226

REQUIRED TEXTS AND OTHER MATERIALS:
1. Experimental Organic Chemistry: A Miniscale & Microscale Approach, 3rd edition. Gilbert and Martin
2. Safety Goggles—Approved by instructor.
3. Notebook—bound, duplicating notebook with tear out sheets.

REQUIRED SUPPLEMENTARY READINGS: Scientific Literature as assigned.

COURSE GOALS:
The student will develop an understanding of and employ proper techniques used in organic synthesis, data collection, product analysis, and documentation. The student will also develop skills in chemical literature search and critical analysis of relevant chemical literature.

STUDENT OUTCOME OBJECTIVES:
At the end of this course the student will be able to
- Synthesize various organic compounds,
- Analyze and identify organic compounds by infra-red spectroscopy, thin-layer chromatography, gas chromatography, and nuclear magnet resonance,
- Prepare scientific reports and utilize chemical journal articles.
- Prepare critical analysis of chemical journal articles.

COURSE CONTENT:
This course will cover various techniques, analysis, and synthesis of compounds (see schedule for exact order)
Typical organic laboratory techniques and procedures,
Modification of carbonyl compounds,
Reaction involving conjugated systems,
Polymer synthesis,
Organometallic synthesis,
Chemical literature searches

COURSE REQUIREMENTS:
All students will perform experiments using proper safety practices.

Notebook: 20 points/experiment	5 experiments	100 points
Laboratory Reports 50 points/experiment	5 experiments	250 points
Chemical Literature Reviews: 20 points/review	5 reviews	100 points
Final Exam		60 points

METHOD OF EVALUATION:
A straight percentage is used to determine grade.
A = 90% (315 points) B = 80% (280 points) C = 65% (228 points) D = 55% (193 points)

MAKE-UP POLICY:
No make-ups are allowed for this class.

ATTENDANCE POLICY:
Attendance is mandatory. If you miss one (1) laboratory with excused absence I will recalculate grade. Unexcused absences result in a zero for that experiment.

ACADEMIC HONESTY POLICY: Any student found cheating will be subject to the penalties as stated in the Student Code of Conduct handbook; including but not limited to a score of zero on exam, expulsion from the class or expulsion from the University.

SEMESTER WITHDRAWALS :
The last day to withdraw from the class with a "W" is 7 April 2005.

ACADEMIC DISABILITIES POLICY: If you have a documented disability that requires assistance, you will need to register with the Office of Disability Services for coordination of your academic accommodations. The Office of Disability Services is located in Peltier Hall, Room 100-A. The phone number is (985) 448-4430 (TDD 449-7002).

CLASS DISRUPTIONS: The use of cellular phones, pagers or any other electronic personal devise is prohibited in class. Any infractions will result in dismissal from class and zero for the experiment.

NOTEBOOK
Notebooks must be written legibly to avoid loss of points.
Prelab Due before beginning the experiment.

- TITLE
- DATE
- PURPOSE Describe what is expected of the laboratory. This should be only one or two sentences, in your own words--do not copy from the manuals.
- PROCEDURE A flow diagram is best. Abbreviated version of what you will be doing. Read the lab and be familiar with what will be happening. Summarize the steps.
- DATA TABLE Listing of all of the reagents and solvents used in the experiment. List in table form only.

reagent or product	molecular weight	mass used or produced	moles used or produced	melting point	boiling point	density	solubility in solvents used.

- CHEMICAL EQUATIONS Write all of the major chemical reactions and side reactions for the experiment. Include the amounts called for in the experiment (which is the limiting reagent?) and the theoretical yield. Not necessary for the distillation, melting point, or crystallization experiments.

You may not begin the experiment until the prelab section is completed and checked by me.

Postlab

- OBSERVATIONS All data and everything that occurs in lab as it happens. Colors, smells, amounts used, mixing, temperatures, apparatus used, time for reaction, spills if they occur etc. Draw pictures if appropriate, use tables, graphs, equations, etc. Record details such as Instrument name and maker, model number and serial number, chemical manufacturer, grade, lot number, expiration date, etc. This section cannot be too long. Spectra are also to be included with this section. Due at the end of lab.
- CALCULATIONS This section will not be graded but must be included to show your work. Must be legible and organized.
- CONCLUSION Report final results (positive or negative) and what evidence was used to make this decision (i.e., Based on FTIR spectra, the final product was . . .)
- RESULTS/DISCUSSION This is the most important section—the analysis and interpretation of the results. This section, to be written concisely and legibly, includes all relevant results and supporting chemical theories and concepts pertaining to the experiment. Mechanisms and chemical equations for the product(s) should be

included. Discussion of new techniques is expected. Percent yields and percent purity should be calculated and discussed. Any deviation of results from expected results (or class average) must be addressed and explained. You must be able to convey your understanding of what went on in the experiment. Include comparison, supporting evidence from relevant literature sources (**go to the library**!!) for the techniques and reactions. Discuss all spectral data provide noting specific values for peaks present and absent between starting material and final product. All figures, tables, graphs, and diagrams must be labeled.

- REFERENCES: Proper citation of all material used in writing the report or to gather background material.
  Journal Citation: authors (last name, first name), *title of journal*, **year of publication** *volume*, page number
  Example: Smith, R. A.; Jones, M. J. *J. Am. Chem. Soc*. **1965,** *80*, 295.

- PRODUCTS Products submitted must be weighed to the nearest milligram, labeled, and turned in at the end of the laboratory. The label must include the following information:

Name of Student
Compound Name and Structure
Mass of Product in Vial and Percent Yield
Percent Purity (if available)
Melting Point (if solid)

Schedule of Experiments

Tuesday	Experiment	Thursday	Experiment
18 January	No class	20 January	Check-In/Safety
25 January	Polymer Literature	27 January	
1 February	Nylon 6, 10	3 February	
8 February	*Mardi Gras Break-no class*	10 February	
15 February	Kinetics/Thermodynamic Literature	17 February	
22 February	Kinetics and Thermodynamic Control of a Reaction	24 February	
1 March	Pericyclic Literature	3 March	
8 March	Diels-Alder Reaction	10 March	
15 March	Carbonyl Literature	17 March	
22 March	Reactions of Carbonyl Compounds	24 March	
29 March	*Spring Break-no class*	31 March	*Spring Break-no class*
5 April	Organometallic Literature	7 April	
12 April	Grignard Reaction	14 April	
19 April		21 April	
26 April	Review/Check-out	28 April	Final Exam