

CHEMISTRY 219 LABORATORY CFS 119

Spring 2008

All Sections

Pre-Lab Meets Monday 3:00-3:50 PM in CFS 103

Instructor:	Dr. Benny E. Arney	Email:	CHM_BE@SHSU.EDU
Office Phone:	294-1531 off-campus ext. 41531 on-campus	Office:	CFS 326 Or CFS 305 Or CFS 323
Website	Blackboard at www.shsu.edu	Office Hours:	TTh : 10:00-11:00 AM 2:30-4:00 PM

**Prerequisites:** Completion of CHM 218 and CHM 238 with a grade of C or higher and concurrent enrollment in CHM 239 or prior completion of CHM 239 with a grade of C or higher.

**Texts:** (1) Chemistry 219 Laboratory Manual,  
(2) "The Organic Chem Lab Survival Manual" by Zubrick (isbn 0-471-12948-8) and  
(3) ORGANIC CHEMISTRY, 7<sup>TH</sup> ED., by John McMurray, Thompson, Brooks/Cole, 2008, ISBN# 0-495-11258-7

**Required Supplies:**

- (1) Department Approved Laboratory Research Notebook with perforated duplicates.
- (2) DEPARTMENT APPROVED SAFETY GOGGLES

**Suggested Supplies:**

- (1) a small container of a good grease-cutting dish-soap.
- (2) latex or neoprene gloves to protect hands.
- (3) a black "SHARPIE" marker to label your glass while in use.

**PRIOR TO COMING TO LABORATORY, YOU MUST HAVE A PAIR OF.** These goggles must be worn at **all times** in the laboratory. You will not be allowed to participate in the day's experiment or activities without safety goggles and will be counted absent with the loss of points associated with the experiment.

**Important NOTICE!!!**

Organic Chemistry Lab requires attendance of a Pre-Lab on Friday afternoon:

ALL Sections

Monday 3:00-3:50 PM

In this Pre-Lab session, the pre-laboratory work will be turned in for the next experiment, the write-up for the previous experiment will be turned in, the laboratory quiz will be given, and the laboratory preparation for the next experiment will be given. If you do not attend the Pre-lab, you may **not** perform the next experiment and will receive a zero for that assignment.

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**Absences:** No make-ups are possible. If you miss one lab the lab final will replace the grade for that particular experiment. Any additional missed experiments will result in zeros for the associated points.

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## **Preparation for the Pre-Lab**

Before coming to Pre-lab, you must prepare for the lab quiz, to perform the experiment, set up your lab notebook, and read and study any assigned or necessary materials.

- (1) Check schedule of experiments to find out which experiment is to be performed and any additional requirements.
- (2) Read the experimental description from the lab manual and any appropriate sections in the Zubrick book covering techniques to be used in the experiment.
- (3) Set up your lab notebook as described below. **NOTE:** You will not be allowed to bring your lab manual to lab. The only personal items allowed in the laboratory are your notebook, Zubrick, calculator, and blue/black nonerasable pen.

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## **In Pre-Lab:**

An overview of the next experiment will be given covering the important aspects of the coming experiment, as well material on spectroscopic analysis. Periodically, problem sets covering spectroscopic analysis and or problems directly related to lab material will be given out that will be due at the next Pre-lab.

A quiz will be given that covers the previous experiment, the general details of the coming experiment, the techniques used in the experiments, spectroscopy, and lab safety.

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## **In Lab:**

Come to lab ready to work. There is only three hours and no more. If you have not completed your work in the allotted time, the experiment will be shut down and points will be lost.

Work safely.

Record all measurements directly in the notebook. Record all actions performed directly into the notebook as you perform them.

As the experiment progresses, clean any used equipment and glass ware before putting it away in your drawers. **NEVER PUT DIRTY GLASSWARE AWAY.**

Make sure all of your equipment is put away before leaving. Any equipment left out in the laboratory will be returned to the stockroom for redistribution and you will be charged for any missing equipment.

## **Schedule of Experiments:**

Pre-Lab	Week #	Experiment #	Title
Jan 28	Feb 4	Handout from BlackBoard and Problem set	Introduction and operation of NMR spectrometer
Feb 4	Feb 11	Handout From BlackBoard and Problem set	Demonstration of Operation of IR
Feb 11	Feb 18	6	Check In, Diels-Alder
Feb 18	Feb 25	1	Methyl m-nitrobenzoate
Feb 25	Mar 3	2	Preparation of 1,4-di- <i>t</i> -butyl-2,5-dimethoxybenzene
Mar 3	Mar 24	4	Acid Preparation by the hydrolysis of an ester.
Mar 24	Mar 31	9	Preparation of 3-Carboethoxycoumarin
Mar 31	April 7	11	Aldol
Apr 7	April 14	12	Chemistry of Amines
Apr 14	April 21	7	Beckmann Rearrangement
Apr 21	April 28		Cleanup, Checkout & Lab Final

## **Notebooks:**

Prior to coming to lab, the notebook must be prepared as outlined below.

**I. First Page with Name and Table of Contents.**

- a. Name and ID # at the Top.
- b. Table of Contents to show 

Page		Experiment Title
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**II. For each Experiment**

- a. Title
- b. A one or two sentence summary of the Experiment.
- c. If a reaction is to be performed, the reaction should be shown using complete structural formulas.
- d. Reagent table as follows: should include all reagents used in the experiment

Reagent	Formula	mol. Wt.	mass or vol	mmoles	Cautions
sodium hydroxide	NaOH	40.0	5.0 g	125	Caustic, strong base

- e. Outline of experimental procedure with sufficient detail to actually perform the experiment. This is very important since the lab manual is not allowed in the laboratory.
- f. Describe your actual procedure. The true amounts of materials weighed out and equipment used. Include any observations such as temperature or color changes. For example:

“I weighed out 4.98 g of NaOH pellets and placed them into a 100 mL single-neck boiling flask. Two boiling chips were added to the flask with 25 mL of water. The dissolved NaOH was very warm, ...

- g. Calculation of percentage yield (if you don't remember how find your freshman text).
- h. Discussion of results.
- i. Answers to questions for the experiment.

**Product:** For each laboratory experiment in which a product is prepared, the product must be weighed, its percent yield calculated, melting point taken if it is a solid, and placed into a sample vial provided. The vial must be labeled with your name, your lab section number, the structure of the product, yield, percent yield, and melting. This is to be turned by the dead-line given the TA for each experiment.

**Reports:** For each experiment, a report will be turned in that consists of the following items.

- a. The complete copy pages from the lab notebook for the experiment.

- b. The spectra with attached interpretation for the prepared product.
- c. The completed original beige question pages from the lab manual.

**Quizzes:** Quizzes will be given at the Pre-lab Lecture. The quizzes will be over the experiment to be performed the following week, all previous experiments, and spectroscopy.

**Grading:** For each Lab a grade will be computed as follows:

First Lab: successfully checking-in and obtaining an NMR Spectrum and Problem set =

$$\text{Attendance x (checkin + NMR Spectra + Problem set)} \\ (0 \text{ or } 1) \times (2 + 4 + 4) = 10$$

Second Lab: successfully obtaining an IR Spectrum and Problem set

$$\text{Attendance x (IR spectrum + Problem Set) =} \\ (0 \text{ or } 1) \times (5 + 5) = 10$$

Others: (note: reports for Exp. 9&10 are turned-in together.

$$\text{Attendance x (Quiz(4pts) + Report(4pts) + Product(2pts)) = Grade} \\ (0 \text{ or } 1) \times (4 + 4 + 2) = \text{max of } 10@$$

Other Problem Sets: 10 points@.

The total of the labs make up 70% of lab grade.      70%

Lab Final (comprehensive) will count 30%      30%  
(experiments and Spectroscopy)      100%

A≥90%, B≥80%, C≥70%, D≥60%, F≤59%