

CHEMISTRY 218 LABORATORY

Fall 2007

1 Credit Hour

All Sections

Pre-Lab meets in CFS 103

Sect. 11,12,13,14 Monday 1:00-1:50 PM

Sect. 21,22,23,24 Monday 3:00-3:50 PM

Laboratory meets in CFS 119

Sect. 11 Tu 12:00-2:50 PM

12 We 12:00-2:50 PM

13 Th 12:00-2:50 PM

14 Fr 12:00-2:50 PM

21 Tu 3:00-5:50 PM

22 We 3:00-5:50 PM

23 Th 3:00-5:50 PM

24 Fr 3:00-5:50 PM

Instructor:	Dr. Benny E. Arney	Email:	CHM_BEA@SHSU.EDU
Office Phone:	294-1531 off-camp ext. 41531 on-camp	Office:	CFS 326 Or CFS 305 Or CFS 323
Website	Blackboard at www.shsu.edu	Office Hours:	

Prerequisites:

Completion of CHM 139 and CHM 119 with grades of C or higher and concurrent enrollment in CHM 238 or prior completion of CHM 238 with a grade of C or higher.

Required Texts:

- (1) Chemistry 218 Laboratory Manual,
- (2) "The Organic Chem Lab Survival Manual" by Zubrick (isbn 0-471-12948-8) and
- (3) John McMurry, "Organic Chemistry", 7th ed., Thomson, Brooks/Cole, 2008, ISBN 0-495-11258-7.

Required Supplies:

- (1) Department Approved Laboratory Research Notebook with perforated duplicates.
- (2) DEPARTMENT APPROVED SAFETY GOGGLES
- (3) Black or blue non-erasable pen for writing in notebook.

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.

Non-erasable pens (**BLUE or BLACK ONLY**) must be used for all laboratory work entries. Pencil or white-out are not acceptable and a minimum of 20% will be deducted from each laboratory for which they are used. Erasures will also cost an additional 20% of possible points for that experiment.

Important NOTICE!!!

Organic Chemistry Lab requires attendance of a Pre-Lab on Monday afternoon in CFS 103:

Sect: 11, 12, 13, 14

1:00-1:50 PM

Sect: 21, 22, 23, 24

3:00-3:50 PM

In this Pre-Lab session, the laboratory quiz will be given, and the laboratory preparation for the next experiment will be given.

Acceptable Attire:

In the laboratory, shorts and open-toed shoes are unacceptable and will not be allowed. **If you show up for lab in unacceptable apparel, you will be sent home and will receive a zero for that week's lab.** Long hair must be tied back and loose flowing clothing is highly discouraged. These are your safety and not for your convenience. We are thinking of your safety even if you are not.

Attendance:

Attendance is required at each scheduled laboratory Pre-lab and session since each experiment will only be performed during the week it is scheduled and cannot be made-up. If you miss a lab session the Post-lab report for that experiment will be recorded as a zero. Late work will not be accepted and the grade for that lab will be a zero.

Check-In & Check-Out:

At the second scheduled meeting of the laboratory each student will be assigned a lab cabinet and drawer containing equipment to perform the experiments scheduled for the semester. During this time make sure to examine each piece of glassware for chips, cracks, and breaks for your own safety and so that you will not be charged to replace it later. Make a note of any missing equipment on the sheet provided.

After you have "checked-in", you are responsible for the equipment in your cabinet, so do not leave it unlocked as one can rarely assume their neighbors are as conscientious as they are.

If you decide to drop the lab, resign from the University, or finish the course after you have checked-in then you must "check-out" with your TA. During "check-out" the cabinet is inventoried against the "check-in" sheet. If you do not "check-out", the TA will check-out the cabinet and you will be charged a \$25 Check-out Fee plus the cost of any missing or damaged items that were placed in your care.

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. Experiment #1 does not need this step. **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.

At Pre-Lab:

An overview of the next experiment will be given covering the important aspects of the experiment, as well material on spectroscopic analysis. Periodically, problem sets covering spectroscopic analysis 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 and lab safety.

Preparation for the Lab

Before coming to lab, you must attend the Pre-Lab in order to learn of any changes in the experiment and to take the lab-quiz. 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. Experiment #1 does not need this step. **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 Lab:

Come to lab ready to work. As you walk-in the door, turn-in to the TA your post-lab write-ups from the last lab experiment and the pre-lab write-up for this experiment. There will be only three hours to perform the experiment 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.

As the experiment progresses, clean any used equipment and glassware 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:

Lab week	Prelab	Experiment
Aug 27	PRE-LAB ONLY: Lab Safety and Procedures	Down-load and Print Out "Introduction" Hand-out from BlackBoard.
Sept 10	Functional Groups and Molecular Models	Check-in and Molecular models
Sept 17	Separation by Extraction using Acid-Base Properties & Introduction to IR Spectroscopy	Acid-Base Extraction Techniques, Before lab begin reading and studying Chapter 12 of McMurray.
Sept 24	Recrystallization & IR Problems	Recrystallization of Acetanilide & Demonstration of Obtaining Spectra
Oct 1	Distillation & Introduction to Nuclear Magnetic Resonance (NMR)	Distillation and Separation of Volatile mixtures. Before lab begin reading and studying Chapter 13 of McMurray.
Oct 8	Dehydration of Cyclohexanol & Intro. To NMR cont'd	Dehydration of Cyclohexanol + NMR Problems
Oct 15	Synthesis and Purification of Aspirin & NMR Problems	Synthesis and Purification of Aspirin + NMR Problems
Oct 22	Functional Group Wet Tests & Spectroscopy Problems	Functional Group Wet Tests + More Spectroscopic problems
Oct29	Benzpinacol-Benzpinacolone Rearrangement, Cannizzarro Reaction, & More structural problems.	Benzpinacol-Benzpinacolone Rearrangement & Cannizzarro Reaction
Nov 12	Finish up Cannizzarro Reaction,	Clean-up, Check-out
Nov 26	No Pre-Lab	Lab Final

Notebooks:

Except for Experiment #1. Prior to coming to the Pre-lab, the notebook must be prepared for conducting the experiment as outlined below. This is necessary, because you will need to be familiar with the experiment and also will not be allowed to bring the lab manual into the laboratory. You must perform the experiment during your assigned lab time using only your notebook and any additional instructions given in the pre-lab.

I. First Page of Notebook 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, MSDS sheets and chemical supply catalogs will available in the laboratory for gathering information needed.

Reagent	Formula	Mol. Wt.	mass or vol	mmoles	Cautions, Notes
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.

After Pre-lab Write-up, when actually performing the experiment:

- a. 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, ...

- b. Calculation of percentage yield (if you don't remember how find it in your freshman text, Chap 3 or 4).
- c. Discussion & Conclusion: Write your interpretation of the observations and results obtained during the laboratory. Why was the yield good or bad? Was the results what you expected? Et cetera.

d. Answers to questions for the experiment.

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

First Lab: successfully checking-in and going through the Lab Handout =
Attendance x (checkin and completion of Handout)
(0 or 1) x 10

Others: (note: reports for Exp. 9&10 are turned-in together.
Attendance x (Quiz(4pts) + Report(6pts)) = Grade
(0 or 1) x (4 + 6) = max of 10

Problem Sets: 10 points@.

The total of the labs make up 50% of lab grade.	50%
Problem Sets handed out in Pre-Lab.	20%
Lab Final (comprehensive) will count 30%	<u>30%</u>
	100%

A≥90%, B≥80%, C≥70%, D≥60%, F≤59%

The report for each experiment will consist of the yellow duplicate sheets from your laboratory notebook with any additional questions from the experiment included in the notebook. This report will be turned in at the beginning of the very next lab period before beginning the experiment. Every experiment must have a conclusion as part of its write-up and report.

The final examination for the laboratory will be comprehensive and will focus on the experience of the laboratory. That is; how is this done?; what should this appear like?; how do I set up this operation?; et al. Know your basic laboratory common sense. What tests are for what? What does a positive result for this or that test mean or look like? Fundamentals of spectroscopy? Remember to pay attention in the lab and record all of your observations in your notebook. Good-Luck.

Treat your laboratory experience like a romantic date and pay attention to what is going on and not just worry about how soon can I get out of here.!!

Remember: If you do not know what you are going to be doing before you get to lab, you probably will not know what you did or did not do when you leave.