318-319 Chemistry Lab Information Sheet
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Winter, 2017 (Lab room 8-312)
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Office Hours: Tu 12-1, W 11-12 Th 11-1
(also, if the door is open, ask)
318-03, W, 8-11, (Beauchamp, 12270), 318-01, Tu 1-4, Tu 4-7, 318-02 Tu 4-7 (Page) (, F 12-3 (Klavetter)

Course Prerequisites Chem 314 / 317L for 318 and Chem 315 / 318L for Chem 319; lecture is a co-requisite

Lab Text and Lab Book - Write your name and phone number in your lab books and hope an honest person finds them if you lose them.

The Lab Text is: Experimental Organic Chemistry, 6th Ed,Gilbert & Martin. Write your name and phone # in all of your books. Get the phone # of another student(s) for missed details.

Helpful for organic lab techniques, if you have it (any edition, older ones are very inexpensive, I found 7th edition for $0.01 on Amazon – plus postage): The Organic Chem Lab Survival Manual, Zubrick, J.W., Wiley

Method of Evaluation

1. Lab reports will make up 50% of the grade. An example format for the lab report is provided and your report should strictly conform to this guideline to receive a good grade on your lab reports.
2. **All prelab information will have to be completed before you can begin work on an experiment.** If you are not prepared for a particular lab, you will not be allowed to participate in that lab.
3. Completed lab reports are due at the **beginning** of the period of the week following the experiment unless you have to get a melting point and/or mass for your percent yield calculation. If questions are required, the answers should be stapled to your report. Late lab reports will be accepted for up to one week after they are due with a **50% reduction in grade!** (That means your starting score is 50 points. A 70 pt lab will get a 20% grade.) Beyond one week late they will not be accepted.
4. A weekly quiz may be given on **the prelab material** (any info in the write up) during the first minute of the lab. This will be easy and you will be allowed to use your lab write up (only). Prelab quizzes, if given, will make up 5 % of the grade.
5. Weekly spectroscopy homework sets will be given. Homework sets will make up 45% of the grade (or 50%). A spectroscopy problem, similar to those given during the quarter will be given as a lab final. It will count the same as three of the weekly spectroscopy problems and will be done in lab by yourself (open book and notes). See links to spectroscopy information on next page.
6. Prelab discussion is essential to our understanding of the experiment. **If you are late for this discussion, 3 % will be deducted from your overall course average for each occurrence (80% → 77%, 74%, 71%, etc.)!**
7. The course grade will be based on the following percentages:

A 87-100 B 74-86 C 55-73 D 45-54 F below 45

General Laboratory Procedure

1. There may be a **5 minute quiz at the start of the lab over info in your prelab write-up**. It will be a straight forward question from your prelab information and you will be allowed to use your notebook (and nothing else). Example: What is the density (or mp or bp) of X? What is the theoretical yield? What is the limiting reagent?
2. A prelab lecture will be given on what is to be covered in that day's lab (begins the lab in 318/319). See point 6 above.
3. All information must be recorded in your lab book in **ink**, including data at the time of observation (not on paper towels, etc.). One partner can keep the observations and the other partner can copy them later. All calculations must show the full setup, all work, correct significant figures and correct units for full credit. Follow the format provided in the example. View the lab notebook as a legal document.
4. The instructor's initials are required before you leave. Your work area must be cleaned before I will sign your lab papers. Don't forget to lock your drawer or locker (about $600 of equipment is in there).
5. Missed labs must be made up in the same week as scheduled. The stockroom personnel take down each experiment as the scheduled week passes. A note is required from me and permission from the instructor of the make-up lab. If you know you are going to miss a lab, schedule a makeup in advance.

Lab Report Point Distribution For Chem 317, 318, 319 – All entries in lab notebook must be in ink.

Note: Anything in pencil is effectively invisible (it can be erased). Mistakes and errors should simply be lined out, with no obliterations (still readable). Rewrite the correct information after or to the side of the error. Everything in a lab notebook should be readable, even the mistakes. **Lab books are legal documents!**

Reaction scheme (just an equation here, mechanisms go in the discussion), Purpose, Goals 5 pts

Table of physical properties of ALL of the chemicals used in the experiment (MW, mp, bp, density, solubilities, hazards, follow example), mole ratios of all reagents used based on the identified limiting reagent 10 pts

Theoretical yield calculation (show a complete set up, calcs./correct units/correct sig. figures) 5 pts

Sketches of all apparati used in the experiment in order of use (reference where shown in text), you don't have to be an artist, but it must be recognizable 5 pts

Prelab write up: Write a step-by step procedure, and number each step 1, 2, 3, etc on left half of page. Leave plenty of room between each step. Each operation should have a separate number. **You should be able to do the entire experiment from your written procedure, not the lab book!** I will assign points based on how well I feel I could do the experiment from your procedure. **If you do not have a prelab, you will not be allowed to do the experiment.**
30 pts

Detailed observations: Be specific and detailed. Record your observations on the right half of the page at the same level as the numbered step in the prelab procedure that it refers to. **Another worker should be able to do the entire experiment using only your procedure and observations.** 30 pts

Results: Summarize and organize your presentation of the results, mp's, bp's, tlc's with component spots identified, if possible, with their R_f values, method of detection, why they are different etc. Clearly summarize any other data (% yield with calculation set up, units, sig. figs. etc.). A quick glance at this section should provide a reader with a summary of what was accomplished in the experiment. 5 pts

Discussion (speculate as to 1. the reasons for..., 2. why you did..., Interpret your yield, tlc. Show a complete step-by-step mechanism for any reactions run. If obvious errors were made, explain how they affected your results, possible questions 20 pts

Analysis of spectral data Spectral data should be tabulated, with major peaks identified and matched with the appropriate part of the molecule to clearly establish structures of starting materials and products.
20 pts

Total Score 130pts

Lab book template: copy is available on my "Courses" web page at:
http://www.csupomona.edu/~psbeauchamp/pdf/318_319_notebook_format.pdf), or use a real lab book with permanently numbered pages and follow my format.

Also available on the same page, under Organic Lab and Spectroscopy Materials

IR spectroscopy info: http://www.csupomona.edu/~psbeauchamp/pdf/IR_Info_Tables_12-31-09.pdf (318 & 319)

NMR spectroscopy info: http://www.csupomona.edu/~psbeauchamp/pdf/NMR_Info_Tables_12-31-09.pdf (318 & 319)

Mass Spec info: http://www.csupomona.edu/~psbeauchamp/pdf/MS_basic_notes,12-31-09.pdf (only for 319)

page 1 = 15 pts.

Title
Reaction of experiment (not the mechanism)
5 points

Table of physical properties of every chemical used in the experiment (mp, bp, density), mass used, moles used, and mole ratios.
10 points

page 2 = 10 pts.

theoretical yield calc. from the limiting reagent, show full set up, units and use correct significant figures.
5 points

simple sketch of each procedure done in lab
5 points

page 3 = 60 pts.

step-by-step procedure, leave room between steps to match with observations
30 points

observations, match with procudure step

Lots of room.

30 points

continue, if necessary

page 4 = 25 pts.

summary of results, mp or bp, if observed, percent yield, TLC results, etc.
5 points

Discussion
show any required mechanisms and answer any questions.
20 points

continue, if necessary

page 5 = 20 pts.

Analyze spectra of starting materials and product. Can write directly on the spectra and use arrows to show what peaks correspond to what parts of each molecule (if known).
20 points

Total points

5
10
5
5
30
30
5
20
20
130

Converted to a percent (out of 10)