

Chemistry 332
Organic Chemistry Lab Summer 2015
M T W Th. 1:00-3:45pm (FR 307)

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Textbook Information:

Experimental Organic Chemistry – A Miniscale and Microscale Approach by John C. Gilbert Stephen F. Martine Fifth Edition (978-0495013341)

Class Attendance and General Advice:

Organic chemistry may seem intimidating at first, but there is logic to it. By the end of the summer, our goal is to have you leave with a solid understanding of Organic principles and lab techniques.

Attendance to the laboratory is essential to a successful experience in organic chemistry; therefore it is mandatory. You are expected to attend every lab session unless you have a University-sanctioned excuse or the TA deems it valid. If for some unforeseen reason you will not be able to attend lab, please notify us as soon as possible. With that in mind, labs will NOT be able to be made up and an absence will result in a ZERO for that experiment.

In addition, ***ALWAYS WEAR YOUR GOGGLES!!!*** Of all the labs you have or will take, Organic Chemistry is probably the most dangerous. Most of the compounds you will be working with are toxic in some form or another. A healthy respect for the chemicals you are using is necessary to have a proper experience. Safety is the number one priority here, so please be careful and read about what you're using.

Above all, do not be afraid to ask us questions.

1. Lab starts promptly at 1:00 PM.
2. Wear appropriate clothing (you will be sent home otherwise)
3. No food or drink of any kind allowed in the lab.
4. Read the pre-lab discussions
5. Notify TA of any glassware breakage, chemical spills, or emergencies immediately
6. Clean your bench and make sure all materials are put away
7. NO phones, tablets, etc. This is for your safety

Prelab:

Before coming in the lab each day, you must read that section in your lab manuals thoroughly (intro, procedure etc).

Notebooks:

A Lab Note Book is required for recording all the experimental data in CHEM 332. Lab notebooks are available at the Storeroom (FR 363) for \$15 (cash or check). Make sure you bring the Notebook with other required materials to each lab (except the check-in day).

I have included what I expect to see in the laboratory notebooks on blackboard. Examples and explanations of these are given on pp.10-13 in the lab manual. **We will be performing the mini-scale procedures** for all experiments. Pencils, white out, colored pens (other than black or blue) are NOT permitted or acceptable for your notebooks. Deductions will be made according to these guidelines and periodic notebook checks will be made (unannounced).

Laboratory Reports:

Lab reports are due the following lab period from which an experiment is completed. Multiple period labs will be due the next lab period after completion. These should be written neatly and **legibly** in black or blue ink. The following information should be included:

1. Name and Date
2. Experiment Title i.e. (The extraction of Caffeine from Tea)
3. Purpose: A brief summary of what you are trying to accomplish and/or learn from this experiment. (Not just a restatement of title). List methods, etc.
4. Data & Calculation: You want to include all the vital information that you should know prior to coming to lab. For example, if you were extracting caffeine, you would want to draw out the chemical structure, and the important physical properties such as MW, melting point or boiling point. The mechanisms of reactions (if you are running a reaction) must be shown in the lab notebooks and can be obtained from the lab manual. Theoretical and percent yields should be calculated if it pertains to the experiment. Include equations and quantities of materials needed. Show your calculations.
5. Procedure: You are expected to write out a general procedure that you will perform during the lab on that day. DO NOT directly copy the procedure from the lab textbook.

6. Observations: While performing the experiment, record any color changes, whether the reaction was exothermic etc. In other words, an active procedure with observations.
7. Results: This is the location where you would record the temperature values (i.e. simple distillation), or melting point range (i.e. m.p of the recrystallization of benzoic acid), etc.
8. Conclusion: I would like to see a brief, but informative conclusion to the lab. You should state possible errors: human error or the scale is off are not acceptable forms of error. A yield may be low because a compound is insoluble and may not have reacted completely, that is a valid source of error. This should be included in your conclusion. I would also like some mention of what you may have learned in the lab, i.e. if you learned a new technique or reaction type.
9. Question/Answers – a few questions will be assigned with each lab from the textbook.

Grades:

The course grade will be assigned based on your point totals from the lab experiments (quality/quantity of reaction products) and reports, quizzes and the final. It is strongly encouraged that you prepare your lab book for the upcoming experiment prior to arriving at class. This pre-lab writing should include equations of experiments, brief descriptions of procedures, and quantities of materials needed.

During the laboratory, your data should be recorded into a laboratory book (in ink), and prior to your departure from lab the TA must sign the data pages. Lab books must also have numbered and duplicate pages. Lab reports are due as assigned by the syllabus. Points will then be assigned based on the quality of data and the presentation of your results. Typical lab reports are provided in the introductory section of the textbook. Lab reports should be in your own writing, and copied lab reports will receive a grade of zero. An **UNEXCUSED** absence will also result in a **ZERO** grade for that lab.

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|------------------------------------|------------|
| Lab Reports (10 at 50 points each) | 500 points |
| Quizzes (10 at 5 points each) | 50 points |
| Final Exam | 100 points |
| Total | 650 points |

Quizzes:

Quizzes will include short question/answers related to

- Theory (ex. such as the definitions in the pre-lab reading)
- Procedure (ex. which layer of the extraction will your product be in)
- Calculations (ex. Percent yield)

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| | 92 – 100 A | 90 – 92 A- |
| Grading Scale: | 87 – 89 B+ | 80 – 86 B |
| | 77 – 79 C+ | 70 – 77 C |
| | 60 – 69 D | 0-59 F |

Safety:

Safety goggles are required at all times, no food or drinks are permitted in the laboratory and waste chemicals must be properly disposed. Refer to the textbook for more comprehensive discussions of safety. Pregnant students should consult with their doctors regarding the risks of being enrolled in this and other laboratory classes.

Your grade in organic laboratory is largely based on the work done in completing the assigned experiments and understanding the techniques/procedures. An important part of any laboratory work involves following laboratory safety rules. Consequently, your grade will also be based upon your adherence to the safety rules.

The table below describes the safety violations and subsequent penalties that will be assessed. Note: a lack of goggles is the most severe offense. Goggles are available free of charge at the chemistry stockroom, and they must be the type approved by the Chemistry Department.

Safety:

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| NO GOGGLES | Minus 30 points |
| NOT CLEANING UP (at the balance, at your work area, in fume hoods) | Minus 20 points |
| FOOD/DRINKS IN LAB | Minus 10 points |
| IMPROPER WASTE DISPOSAL | Minus 10 points |
| DISPOSING GLASS IN WASTE BASKET (Designated “Glass Waste” container to be used) | Minus 10 points |

Miscellaneous:

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| COMING IN LATE | Minus 10 points |
| LATE PRELABS/ LAB REPORTS | Minus 10 points per day |

Lab Calendar:

| Date | Experiment |
|-------------|---|
| 06/15/15 | Check In |
| 06/16/15 | Exp. 3.2B Recrystallization & Melting Point of Benzoic Acid |
| 06/17/15 | Exp. 4.3 Simple Distillation |
| 06/18/15 | Exp. 4.4 Fractional Distillation |
| 06/22/15 | Exp. 5.3A One-Base Extraction |
| 06/23/15 | TLC of Drugs (read pps 175-180) |
| 06/24/15 | Exp. 14.4 Preparation of 1-bromobutane |
| 06/25/15 | Exp. 14.5 Preparation of 2-Chloro-2-Methylbutane |
| 06/29/15 | Exp. 10.6 Bromination of (E)-Stilbene |
| 06/30/15 | * Dehydration of 4-methylcyclohexanol * |
| 07/01/15 | Exp. 15.3 Friedel-Craft Acylation of m-Xylene |
| 07/02/15 | Check Out/Review |
| 07/06/15 | Final Exam |

No Class on July 4th

Quizzes will be given at the start of every lab period.

Final Exam will be on **07/06/2015** at the normal lab time and room.

* Those labs are NOT in your lab textbook, these are provided handouts.