Please see https://uh.simplesyllabus.com/ for section/semester specific details

CHEM 2125 | Organic Chemistry Lab II

Section: _____ | Face-to-Face
_____ | University of Houston; Science Teaching Laboratory; STL _____

Prerequisite(s): CHEM 1112 and credit for or concurrent enrollment in CHEM 2325. Syntheses, reaction mechanisms, and qualitative organic analysis.

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**Disclaimer: The Instructor of Record has the authority to alter this syllabus in the case of weather events, university power outages, pandemics, or any other event that requires the university to close or if changes in the availability of required chemicals occur. **

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I. Lab Coordinator- Office and Email:

Dr. Crystal Young, Office TBD, cayoung@uh.edu (Try Teams First! I will not respond to any message on any other platform)

There are 32-36 sections of organic lab every semester. Always include the course number (2125), the 5-digit class number, and your TA's name in any email to the lab coordinator.

Your TA is the first point of contact for your questions pertaining to lab except for make-up lab requests (see Make-Up Policy).

Your TA's name:_____ Office:_____ Office hours:_____

If your TA cannot satisfactorily resolve an issue, contact the Lab Coordinator as soon as possible. **The end of the semester, especially after grades are submitted, is not the best time to report problems**. (Example: If the TA is not returning the graded lab reports in a timely manner, let the Lab Coordinator know asap.)

II. Lab Students Requiring Assistance under the Americans with Disabilities Act:

Please make an appointment with me within the first two weeks of class to discuss your accommodations.

Required Instructional Materials

III. Supplies for Lab:

For the laboratory you will need the following items:

1. **The textbook**: "Organic Lab Manual, Custom 2nd Edition – University of Houston" ISBN-13: 9781337453042, This is a custom manual published by Cengage Learning. It is available only at the UH Bookstore.
2. **A laboratory notebook** that is permanently bound, has serially pre-numbered pages, and allows you to make a removable carbon copy which can be turned in for grading.
3. **A laboratory coat** that is long-sleeved and knee length. The coat must be completely buttoned during lab.
4. **Sturdy, closed-toed shoes that cover the entire foot**. Sandals or shoes that leave a large area of the foot exposed are NOT allowed.
5. **Safety goggles (NOT SAFETY GLASSES)**. The laboratory coat and goggles must be worn in the laboratory at all times anyone in the laboratory is doing experimental work.
6. Long pants or other garment that **completely** covers the legs. Shorts, short skirts, and short dresses are NOT allowed in the lab. Suggestion: Keep a pair of loose scrub pants that may be worn over shorts or under skirts in your backpack.
7. **A STRONG, RELIABLE lock** for your laboratory drawer. This lock must be placed on your drawer at the end of check-in on the first day of lab. You are responsible for any broken, missing, or stolen glassware and equipment at the end of check-in. Lock your drawer whenever you leave your bench, even if only walking across the room. Lock your drawer at the end of every lab period. **Never** leave the combination on the back of a combination lock.

A special note about locks:

If you did not bring your own lock on lab check-in day, remember to bring it to the next lab. The TA will unlock the department lock on the second lab day, **but only if you have your own lock**. Without your own lock, you will not be able to participate in lab.

Forgetting your lock's combination or key is not an excuse for a make-up lab. The TA can cut off your lock, so that you can participate in lab.

Organic Lab Manual, Custom 2nd Edition – University of Houston
ISBN: 9781337453042
Publisher: Cengage Learning

IV. Lab Safety:

The Department of Chemistry takes safety seriously. All safety rules described on page 1 of the lab manual and in the safety video are important for your SAFETY. Two rules are given extra attention below.

Goggles:

Wearing your goggles over your eyes (not on your forehead, on the top of your head, or around your neck) is required from the time anyone in the laboratory begins experimental work until **you leave the lab**. These times include while you are writing in your lab notebook, using the melting point apparatus or balance, washing glassware, cleaning up at the end of lab, taking an IR spectrum, and talking to your TA at the TA bench. This precaution may save your eyesight.

If you receive excessive goggle warnings, the TA or the lab coordinator will ask you to leave the lab, and you will receive a zero for the lab report for that period.

Cell Phone, Laptop, or Tablet Use:

Being distracted while performing laboratory work can be dangerous. Use of these electronic devices is a distraction and is prohibited in lab. Common solvents used in the lab, such as acetone, can corrode the components of these devices. The chemistry department is not responsible for any damage caused to these devices if they are used in the lab.

Grading Rubrics and Weights

V. Grading Policies:

A. Lab Reports: 60% of the grade

A copy of the Lab Report Format with details is given later in the syllabus. There are eleven lab reports for the semester. The Pre-lab (sections I-V) is due and must be given to your TA at the beginning of each lab period. The Experimental Procedure/Observations/Data section (Section VI) is due at the end of the lab period and must be given to the TA before you leave the lab. The Post-

lab (written after lab, sections VII-X) is due at 11:59 PM TWO DAYS after the lab is completed. (Example: Monday labs are due on Wednesday.) Completion of a lab means that all data has been collected. Data includes melting points, masses, and TLC.

One lab report grade is automatically dropped for each student.

Each lab report will be graded on the following basis:

Laboratory report write-up: ~ 50% (This is the "effort" portion of the grade.)

Yield, purity, identification of unknowns, etc.: ~ 50% (This is the "results" portion of the grade.)

Note: All products generated must be turned in to the TA to receive credit for the lab.

Late Lab Reports: The penalty for a late lab report is 10 points per day. Under extreme, verifiable circumstances, the lab coordinator, not the TA, may adjust this penalty. Contact the lab coordinator.

B. Quizzes: 15% of grade. There are four quizzes. None are dropped. The quizzes may be pop quizzes. The quizzes may cover the experiment of the day or the experiment of the previous week.

C. Final Exam: 25% of grade (Covers everything.)

D. Letter grade definitions:

A = superior performance

B = very good performance

C = average performance

D = poor performance

F = failing

Please notice that the grade definitions are couched in terms of performance achieved not effort expended. The letter grades are determined by the lab coordinator and are determined by comparing the average in a given section to the overall average of all of the sections. If a TA's stricter than average grading results in a lower class average, that section will receive a curve to compensate for the difference. If a TA's lenient grading results in a much higher class average, that section will receive a curve to compensate for the difference. The latter case occurs infrequently

and is used in extreme cases. (For example, a grade distribution in which 80% of students receive A/A- and 20% of students receive B+/B/B- is not possible, reasonable, or fair to students in other sections.)

The starting point for any curve is the standard grade scale given below:

A=93-100, A- =90-92, B+ =87-89, B=83-86, B- =80-82, C+=77-79, C=73-76, C- =70-72,

D+=67-69, D=63-66, D- =60-62, F=59 and below

VI. Academic Honesty Policy:

The organic chemistry laboratory is a class just like any other class. As a result, you are expected to do your own work. **There are no lab partners in the organic chemistry laboratory, and all work is to be done individually**. This includes, but is not limited to, the writing up of your lab reports. You are not allowed to work with others on your lab reports.

Additionally, the melting points and yields of your products may be checked by your lab instructor. The penalty for falsifying laboratory results or engaging in any kind of academic dishonesty may be the award of a grade of "F" for the laboratory course. Any questions or comments regarding this matter should be directed to Dr. Young.

Reminder: Plagiarism is **CHEATING**. Copying directly from any source (the lab manual, a website, another student, an old lab report, chatGPT, or any AI system) is not allowed.

Academic Honesty WARNING: Melting Range Procedure

The following is the **correct procedure** for obtaining the melting range of a sample when the melting point is known:

The sample is quickly heated to within 10-15°C of its melting point. The heating rate is then slowed to increase 1-2°C per minute until the sample melts.

Setting the digimelt apparatus to rapidly rise through the melting range is NOT the correct procedure and may result in a loss of points or a charge of academic dishonesty.

Example:

If a student allows the temperature to rapidly rise and then puts an impure sample into the digimelt apparatus when the temperature is slightly below the literature value, the sample will instantly melt. (This is NOT correct procedure.) When the TA checks the melting point of the student's sample, and it melts far below the temperature reported by the student, the student will be charged with engaging in academic dishonesty, not with making a mistake in melting point procedure.

VII. Make-Up Policy:

A. **Missed Lab**: A make-up lab is not guaranteed and is possible only if space allows and the excuse is for a reasonable, **nonacademic** issue. Make-up labs must be done in the week the lab is missed. Make-up labs are arranged by email with the lab coordinator (Dr. Young), not with the TA. In the email request, include the course number (2123), the 5-digit class number, and your TA's name. Copy the email to your TA.

If a make-up lab is not possible, and the absence is due to a reason listed in the official UH Excused Absence Policy, it will be excused. The missed lab report grade will be replaced with the average of your lab reports. To receive an excused absence, the absence and excuse must be immediately reported by email to the lab coordinator (Dr. Young) and **documentation must be provided**. Please copy the TA. In the email request, include the course number (2123 or 2125), the 5-digit class number, and your TA's name.

B. **Missed Quiz:** One make-up quiz will be given at the end of the semester. The make-up quiz will replace any quiz missed with a reasonable excuse. **It cannot be used to replace a lower quiz grade.**

VIII. UH CAPS Statement:

Counseling and Psychological Services (CAPS) can help students who are having difficulties managing stress, adjusting to college, or feeling sad and hopeless. You can reach CAPS (www.uh.edu/caps) by calling 713-743-5454 during and after business hours for routine appointments or if you or someone you know is in crisis. No appointment is necessary for the "Let's Talk" program, a drop-in consultation service at convenient locations and hours around campus. http://www.uh.edu/caps/outreach/lets_talk.html

IX. Broken or Missing Equipment Policy:

At lab check-in, you will be instructed to verify whether any of the equipment in your assigned drawer is broken or missing. It is important that you carefully check the contents of your drawer and report any discrepancies to your TA. After the initial check-in, if you break or lose equipment from your drawer during the semester, you must purchase replacements at the University Research Stores in the basement of the Fleming Building, Room 70. **Because of the importance of quality control, you may not purchase glassware or equipment from any other source such as amazon.com. You will be charged the full stockroom price if you substitute another brand.**

IMPORTANT NOTE: The Research Store only accepts credit (Discover, Mastercard, Visa, and Amex) and debit cards. It does NOT accept cash or Cougar cash. If you break equipment or something turns up missing during your lab session, you must have a credit or debit card available to purchase a replacement. Equipment cannot be borrowed from Research Stores or your TA. If you cannot finish your lab because you cannot or will not purchase replacement equipment, you must ask your Lab Coordinator (Dr. Young) for permission to come to a different lab to finish your experiment. An alternate lab may not be available, and it is completely at the Lab Coordinator's discretion whether you will be allowed to make up the lab under this circumstance. Bottom line: Avoid problems by making sure that you have a credit or debit card with you when you come to lab.

At your last scheduled lab session of the semester, you will have the opportunity to check the contents of your drawer and purchase replacement items at the Research Stores as needed. If you do not complete your checkout for any reason (e.g., you drop the class, you do not show up for checkout, etc.) or you cannot or refuse to purchase replacements for broken or missing equipment, you will be charged the cost for replacements plus an additional $10 service charge on your University fee bill.

You are solely responsible for the equipment in your drawer. Use the equipment properly and keep track of the equipment when your drawer is unlocked to avoid having to replace costly equipment and possibly incur unnecessary fees. Lock your drawer whenever you step away from it even if only for a moment and especially at the end of the lab period.

X. Care of Equipment, the Lab Space, and Reagents:

A. The fancy equipment:

Much of the equipment used in scientific laboratories is surprisingly expensive. Over the last four years more than two hundred thousand dollars has been invested in upgrading the equipment and

laboratory facilities in the organic laboratories alone. It is obvious that the equipment recently added must be maintained in good condition for many years, since it cannot be replaced very often. If it is to have a satisfactory lifetime, you must cooperate by using it correctly.

Most importantly, the balances must not be abused by having chemicals spilled on them. To avoid doing so, place on the balance pan only a container which is clean and dry on the outside, and **NEVER ADD CHEMICALS TO THE CONTAINER WHILE IT IS ON THE BALANCE PAN**. First remove the container to the desktop nearby, add the chemicals, then return the container to the balance for reweighing.

B. Liquid Reagents:

Place no liquid wastes in the sinks except those approved for disposal down the drain. All others must be placed in the properly labeled waste bottles provided for them.

C. Solid Reagents:

Place no solid wastes of any kind in the sinks or drain troughs. Boiling chips are particularly hard on drains. Keep them out of the sinks.

D. Any Reagent:

Reagent bottles must be capped at all times they are not actually being used. You must replace the cap on each bottle as soon as you have finished using it. Never uncap more than one bottle at a time. **Never** transfer solid material from the bottle to the inverted bottle cap. Use a weighing boat for that purpose. **Never** leave unlabeled materials in weighing boats, etc., on the benchtop.

Never return unused reagent to the original container, i.e., don't contaminate the source.

If proper techniques are used, there is little occasion for chemicals to be spilled on the benchtops near the balances or on the hood surfaces. Any chemicals spilled should be cleaned off immediately by the person spilling them using a method appropriate to the substance spilled. Ask the TA for help.

XI. The Laboratory Notebook (What to do with it and how to make corrections):

Section VI of the Laboratory Report Format (found below) is to be recorded in the laboratory notebook. The lab notebook is intended to be the record of what you do and observe in the laboratory. Although it should be written as legibly as possible, accuracy and completeness are its major goals, rather than neatness. All experimental procedures and observations should be made directly in the laboratory notebook **with ink**. It should be carried to the balance, and the weight measured recorded there. It should accompany you to the melting point apparatus, and so forth.

SCRAPS OF PAPER WITH EXPERIMENTAL OBSERVATIONS JOTTED ON THEM ARE SUBJECT TO CONFISCATION.

Some experiments may extend over two lab periods, so you are expected to secure your instructor's initials in your notebook at the beginning of each laboratory period, and at the end as well, so that it is obvious what you wrote during each period.

Corrections of in the notebook must be made in such a way that the original data or observation remains legible. Simply draw one line through the item to be deleted and write in the corrected entry. Never erase, white out, or otherwise attempt to alter the original or the carbon copy. **Whenever corrections are made to data, you must obtain your TA's initials or signature beside the correction.**

The carbon copy is removed from the notebook and turned in to the TA at the end of the lab period. The original remains in the notebook. When writing, be sure to press hard enough that the carbon copy is legible. **If a page in the notebook is skipped within a report, draw an "X" across the page and hand it in with the report. The pages turned in must be sequential.**

All other sections of the lab report may be composed and typed outside of the lab. (See Laboratory Report Format below).

XII. The Laboratory Report Format (How to write the lab report):

Be sure to include your name, **your TA's name** and the 5-digit class # at the top of each page of the report. Always use language appropriate for a scientific paper. For example, statements in the Conclusions section such as "This lab was easy and really fun" or "This lab was really hard and took too much time" are not suitable or relevant. The format for the report is below.

I. Title and Date

This section simply gives the title of the experiment and the date it was (will be) performed.

II. Answers to the Pre-Laboratory Exercises

This section includes the answers to the assigned pre-laboratory questions.

III. Purpose

This section includes a brief explanation of why you are doing the experiment or what you hope to learn.

IV. Reactions

If the lab involves carrying out a chemical reaction, you must write the chemical equation by drawing the structures of the reactants and products. **Screen shots of the reaction in the lab manual or from any other source may not be used.** Omit this section, if no reactions are involved.

V. Table of Physical Constants

This section is a **table** that lists all of the chemicals that will be used in the experiment, including any products formed, as well as physical data for each compound: molecular weight (g/mol), melting point (°C), boiling point (°C), density (g/ml), and **hazards**. This information can be obtained at various websites such as www.sigmaaldrich.com, www.fishersci.com, or www.alfa.com. Click on the MSDS for each compound to find the physical data.

VI. Experimental Procedure/Observations/Data (Must be written directly into the lab notebook **during** the lab period.)

- This section includes a detailed description of what you did while in the laboratory. Refer to the figure in the Lab Manual for any apparatus used. A sketch of the apparatus is not necessary.
- Use past tense when recording procedure. Example: 10g of X were added to the solution. Use passive voice. Example: The solution was stirred for 1 hour. Not: I stirred the solution for 1 hour.
- Be particular about reporting the actual amounts of materials used (not the amount given in the lab manual) and any modifications to the original procedure. Avoid simply copying the original procedure.
- Include any important observations made during each step such as color changes, precipitation, dissolving of solids, gas evolution, etc. At the end of this section, record any

data collected such as melting ranges, weights, etc.

This section is to be written in the lab in your lab notebook. You should record each step as you perform it or shortly after you perform it. Do not wait until the end of the lab period to recall each step. Data and observations are to be recorded directly into the lab notebook at the time the data is collected or the observations are made.

Note: TLC plates must be sketched to scale in the notebook and then turned in at the end of lab to the TA. GC chromatograms and IR and NMR spectra are considered data. **These must be turned in with the report.**

VII. Calculations

This section includes calculations such as Rf values, theoretical yields, percent yields and percent recoveries. Any time a reaction is carried out, it will be necessary to calculate a theoretical and percent yield. If no calculations are needed for the experiment, this section is omitted.

VIII. Results and Discussion

This section includes the results of the experiment as well as the interpretation of any observations made during the experiment. This is where the yield and melting point or boiling point should be discussed. Additionally, include whether the results of the experiment were as expected. If they were different from the expected results, give a reasonable explanation as to why.

IX. Conclusion

This section includes an overall evaluation of the results. It should include statements indicating what was learned in the experiment. Additionally, include any modifications to procedure that might improve the outcome of the experiment.

X. Answers to Post-Laboratory Questions

This section includes the answers to the assigned post-laboratory questions.

XIII. When the Sections of the Lab Report Are Due:

Sections I-V will be referred to as the Pre-Lab and must be completed **before** coming to lab. These sections may be typed and printed. These sections must be turned in **at the beginning** of each lab or no credit will be received.

Section VI is to be written **in the lab** as you are performing the experiment or reaction. It is not a procedure that is written down before you begin and then followed. It is to be written in ink in the lab notebook. Press firmly. The **carbon copy** must be turned in at the end of the lab period for credit.

Sections VII-X will be referred to as the Post-Lab. These sections may be typed and printed outside of lab. The Post-Lab is due by 8:30 PM two days after completion of the lab. (Example: The reports of Monday sections are due on Wednesday by 8:30 PM.) Completion of the lab includes all data collection such as masses and melting ranges. If a sample is left to dry until the next lab period, or other parts are to be completed in the next lab period, the lab report will be due two days after the work is completed. Your TA will describe the procedure for turning in this section of the report. In some cases, a pdf of the report may be emailed to your TA or uploaded to Canvas as proof that your report was completed by the deadline. The hardcopy of the report must be turned in **no later than two days after the deadline, and it must match the pdf**. Only the hardcopy is graded for credit.

Course Schedule, Assignments, and Assessments

XIV. Weekly Lab Schedule and Information:

NOTE: Few lab manuals are perfect. Sometimes adjustments in procedure need to be made for the best results. Sometimes safer reagents are substituted for those in the lab manual. The syllabus describes most of these changes, but additional changes may sometimes be necessary. It is the responsibility of the student to make note of any such change when given by the TA.

The order in which the experiments are performed in the lab may not be the same as the order in the manual. Always refer to the syllabus each week and carefully read all information related to the experiment. More information about each reaction can always be found in the appropriate chapter of the CHEM 2325 lecture textbook (Wade or McMurry – whichever you have).

SPECIAL NOTE: Arriving to lab on time is important. For safety reasons, if you are more than 15 minutes late, you may not perform the experiment. Ask the lab coordinator if a make-up lab is possible.

General Note: Often post lab questions in the manual ask about limiting reagent, theoretical yield, % yield, and certain observations and conclusions in the experiment. These are not assigned as postlab questions, because this information is always required in other sections of the report.

Dates given in the schedule: This syllabus is used for lab sections meeting throughout the week. Tuesday sections will be the first lab to perform the new experiment and Monday sections will be the last sections to perform any experiment. For example, when lab work is designated for August 25-30, it does not mean that a student can choose any day in that week to do the work. For example, students in Monday sections will do the work on August 25. Students in Tuesday sections will do the work on August 26, etc. Always pay careful attention to the dates given in the syllabus.

Week 1 Orientation and Check-in. Wash glassware if necessary and watch film on safety.

Labor Day Holiday – No sections meet today. Tuesday – Saturday sections will meet this week. Note: After Labor Day, the Monday sections will be at the end of the "lab week". This means that the Tuesday sections will be the first to perform any experiment and the Monday sections will be the last to perform any experiment.

Week 2 **Remember to bring your lab coat, goggles, lab manual, and lab notebook. You will not be allowed to participate without the proper shoes, lab coat, covered legs, and goggles. If you did not bring a lock on the first day (check-in), you must have a lock by today. Your lock will not be unlocked unless you have a replacement lock of your own.**

Remember to bring the completed pre-lab sections (sections I-V) to hand in.

Prelaboratory preparation: Read "Safety Guidelines", p. 1.

Review oxidation of alcohols to aldehydes and ketones.

Read "Oxidizing Methoxybenzyl Alcohol to Methoxybenzaldehyde Using Phase-Transfer Catalysis", pp. 217-229 in the lab manual.

Prelab Questions: 1-5, pp.231-232.

The semi-microscale procedure will be performed. TLC to determine the reaction time will be omitted. The reaction mixture will be stirred for 45 minutes. After the product is isolated, you will learn to use the FT – IR to obtain the IR spectrum of the product.

Always be sure to turn in any spectra acquired with your lab report.

Postlab Questions: 3, 4, 6, and 7 p. 230.

Week 3 Review the reduction of aldehydes and ketones to alcohols. Read “Reducing Benzil Using Sodium Borohydride”, pp. 197-208 of the lab manual.

Prelab Questions: Answer questions 1 – 6 on pp. 211-213.

Reducing Benzil: The semi-microscale procedure as written will be used to reduce benzil. Methods 1, 3, and 4 will be used to identify the product.

NOTE: Sketch any TLC plates obtained in this lab and subsequent labs to scale in your notebook. Rulers will be provided. All TLC plates must be turned in at the end of lab. Place them in the plastic bag provided and label the bag with your name and ID#. Give the bag to your TA. An evaluation of these plates for appropriate sample application and concentration, proper marking of developed spots, and correct Rf values will contribute to the grade.

Post-lab questions: Questions 1, 2, 3(only the techniques used), and 5 on page 209. Question #4 should be answered in the Calculations section of your lab report.

Week 4 Two Methods for the Synthesis of Phenacetin, pp. 233-245. Only the semi-microscale Williamson Ether Synthesis will be performed.

Prelab Questions: 1, 3, 4, pp. 249-250.

Postlab Questions: 4,5; p. 248.

Week 5 Diels-Alder Reaction, pp. 251-260. The macroscale procedures for Parts 1, 2, and 3 will be performed. **Prelab Questons**: 1-4, pp. 262-263.

Part 1, Cracking Dicyclopentadiene: Follow the written procedure using 10 mL of dicyclopentadiene in a 50 mL round bottom with a 25 mL round bottom flask as the receiver. Distil until 1-2 mL remain in the 50 mL flask.

Special Note for handling dicyclopentadiene: Dicyclopentadiene has a strong, unpleasant odor. Measure the compound in the supply hood, transfer to the round bottom flask in the hood and then cover the flask with aluminum foil for transport to your hood.

Disposal of leftover dicyclopentadiene and excess cyclopentadiene: Transport to the waste hood in a covered container and transfer to the waste bottle. Rinse the container with acetone and transfer the acetone to the waste container. Due to the formation over time of dangerous peroxides, do not store any dicyclopentadiene or cyclopentadiene in your drawer!

Parts 2 and 3 will be performed as written.

Postlab Questions: None

Week 6 Nitrating Acetanilide or Methyl Benzoate: Electrophilic Aromatic Substitution, pp. 269-276. Both nitrations will be performed and the substitutions will be compared.

Prelab Questions: 1, 2, p. 279.

Postlab Questions: 1c, 1d, 2,3, p. 277.

Week 8 Classification and Identification of Aldehydes and Ketones, pp. 295-302.

Prelab questions: 1-4, p. 304.You will perform the 4 classification tests on the known compounds given in Table 3 on p. 299 with one exception and on an unknown compound. Instead of cyclohexanone, 3-penatanone will be used in the classification tests. For the Tollen's Test, the solvent bis-(2-ethoxyethyl) ether will be omitted. Carefully record all observations in your notebook.

When performing the 2,4-DNP test (test 4) on the unknown, you will use the quantities and procedure given on p. 300 in the "Formation of Derivatives" section, #4. From this 2,4-dinitrophenylhydrazone derivative, you will determine the identity of the unknown.

Post-lab questions: 1-4, p. 306.

Week 9 Synthesis of Trans-9-(2-Phenylethenyl)Anthracene: A Wittig Reaction, pp. 307-317. The microscale procedure will be performed.

Prelab Questions: 1, 2, 4, pp. 319-320.

Postlab Questions: 2-5, p. 317.

Week 10 Esterification and Hydrolysis, pp. 333-346. **Prelab Question**: Exercise in gray box on p. 333.

Procedure 4 on p. 342 will be used to prepare Methyl Salicylate (oil of wintergreen) rather than Methyl Benzoate (no aroma, so no fun).

Procedure Modifications: (Your TA will provide a handout, also.)

1. 10.0 g of salicylic acid and 40 mL of methanol are used instead of 10.0 g of benzoic acid and 25 mL of methanol.

2. After the 1 hour reflux, the cooled solution is decanted into a separatory funnel containing 30 mL of water instead of 50 mL of water.

3. t-butyl methyl ether (TBME) is used for extraction.

4. The TBME layer is washed twice with sodium bicarbonate instead of once.

5. The TBME layer is dried over sodium sulfate instead of calcium chloride.

6. The dried TBME is decanted into a pre-weighed 250 mL round bottom flask and removed by rotary evaporator. The methyl salicylate is not distilled.

7. Record the color, odor, and mass. Calculate % yield. Obtain IR and NMR.

8. TLC is performed using methanol as the solvent and dichloromethane as the eluent. (Remember to sketch the plate in your notebook and turn it in to your TA as described earlier.)

Postlab Questions: 1-3, p. 344.

Week 11 Two Methods for the Synthesis of Phenacetin, p. 233. Only the semi-microscale Amide Synthesis of Phenacetin will be performed. Read pp. 233-234 (a review of the importance of phenacetin), pp. 235-236, and pp. 243-248.

Prelab Questions: 1 and 5, pp. 249-250.

Postlab Questions: Answer #3, p. 248 as if a mixture melting point had been performed. (Remember, theoretical and percent yield calculations should be in the Calculations section of the report, and IR and NMR data should be discussed in the appropriate section.)

Week 12 A Multistep Synthesis Sequence: An Aldol Condensation, A Michael Addition, and Ethylene Ketal Formation, pp. 347-366. Only the Aldol Condensation and Michael Addition will be performed. The semi-microscale procedures will be performed.

Prelab Questions: 1, 3, 4; pp 365-366.

Postlab Question: 5, p. 364.

Week 13 Properties of Amines – A handout

The pre and postlab questions are identified in the handout.

Important Note: If time permits, wash all glassware and make sure that all of the necessary equipment is in your drawer for check-out next week. It is your responsibility to replace anything lost or broken during the semester by purchasing at the NSM Research Store.

Week 14 Final Exam (Cumulative) and Check-out.

University Policies and Student Support Resources

Mental Health and Wellness Resources

The University of Houston has a number of resources to support students' mental health and overall wellness, including CoogsCARE and the UH Go App. UH Counseling and Psychological Services (CAPS) offers 24/7 mental health support for all students, addressing various concerns like stress, college adjustment and sadness. CAPS provides individual and couples counseling, group therapy, workshops and connections to other support services on and off- campus. For assistance visit uh.edu/caps, call 713-743-5454, or visit a Let's Talk location in-person or virtually. Let's Talk are daily, informal confidential consultations with CAPS therapists where no appointment or paperwork is needed.

Need Support Now? If you or someone you know is struggling or in crisis, help is available. Call CAPS crisis support 24/7 at 713-743-5454, or the National Suicide and Crisis Lifeline: call or text 988, or chat 988lifeline.org.

Title IX/Sexual Misconduct

Per the UHS Sexual Misconduct Policy, your instructor is a "responsible employee" for reporting purposes under Title IX regulations and state law and must report incidents of sexual misconduct (sexual harassment, non-consensual sexual contact, sexual assault, sexual exploitation, sexual intimidation, intimate partner violence, or stalking) about which they become aware to the Title IX office (known at UH as the Equal Opportunity Services office or "EOS"). Please know there are places on campus where you can make a report in confidence. You can find more information about resources on the UH Title IX/Sexual Misconduct Resources page. Please note that you may also report concerns of discrimination based on your protected class identity to EOS.

Reasonable Academic Adjustments/Auxiliary Aids

The University of Houston is committed to providing an academic environment and educational programs that are accessible for its students. Any student with a disability who is experiencing barriers to learning, assessment or participation is encouraged to contact the Justin Dart, Jr. Student Accessibility Center (Dart Center) to learn more about academic accommodations and support that may be available to them. Students seeking academic accommodations will need to register with the Dart Center as soon as possible to ensure timely implementation of approved accommodations. Please contact the Dart Center by visiting the website: https://uh.edu/accessibility/ calling (713) 743-5400, or emailing jdcenter@Central.UH.EDU.

The Student Health Center offers a Psychiatry Clinic for enrolled UH students. Call 713-743-5149 during clinic hours, Monday through Friday 8 a.m. - 4:30 p.m. to schedule an appointment.

The A.D. Bruce Religion Center offers spiritual support and a variety of programs centered on well-being.

The Center for Student Advocacy and Community (CSAC) is where you can go if you need help but don't know where to start. CSAC is a "home away from home" and serves as a resource hub to help you get the resources needed to support academic and personal success. Through our Cougar Cupboard, all students can get up to 30 lbs of FREE groceries a week. Additionally, we provide 1:1 appointments to get you connected to on- and off-campus resources related to essential needs, safety and advocacy, and more. The Cougar Closet is a registered student organization advised by our office and offers free clothes to students so that all Coogs can feel good in their fit. We also host a series of cultural and community-based events that fosters social connection and helps the cougar community come closer together. Visit the CSAC homepage or follow us on Instagram: @uh_CSAC and @uhcupbrd. YOU belong here.

Women and Gender Resource Center

The mission of the WGRC is to advance the University of Houston and promote the success of all students, faculty, and staff through educating, empowering, and supporting the UH community. The WGRC suite is open to you. Stop by the office for a study space, to take a break, grab a snack, or check out one of the WGRC programs or resources. Stop by Student Center South room B12 (Basement floor near Starbucks and down the hall from Creation Station) from 9 am to 5 pm Monday through Friday.

Academic Honesty Policy

High ethical standards are critical to the integrity of any institution, and bear directly on the ultimate value of conferred degrees. All UH community members are expected to contribute to an atmosphere of the highest possible ethical standards. Maintaining such an atmosphere requires that any instances of academic dishonesty be recognized and addressed. The UH Academic Honesty Policy is designed to handle those instances with fairness to all parties involved: the students, the instructors, and the University itself. All students and faculty of the University of Houston are responsible for being familiar with this policy.

Excused Absence Policy

Regular class attendance, participation, and engagement in coursework are important contributors to student success. Absences may be excused as provided in the University of Houston Undergraduate Excused Absence Policy and Graduate Excused Absence Policy for reasons including medical illness of student or close relative, death of a close family member, legal or government proceeding that a student is obligated to attend, recognized professional and educational activities where the student is presenting, and University-sponsored activity or athletic competition. Under these policies, students with excused absences will be provided with an opportunity to make up any quiz, exam or other work that contributes to the course grade or a satisfactory alternative. Please read the full policy for details regarding reasons for excused absences, the approval process, and extended absences. Additional policies address absences related to military service, religious holy days, pregnancy and related conditions, and disability.

Recording of Class

Students may not record all or part of class, livestream all or part of class, or make/distribute screen captures, without advanced written consent of the instructor. If you have or think you may have a disability such that you need to record class-related activities, please contact the Justin Dart, Jr. Student Accessibility Center. If you have an accommodation to record class-related activities, those recordings may not be shared with any other student, whether in this course or not, or with any other person or on any other platform. Classes may be recorded by the instructor. Students may use instructor's recordings for their own studying and notetaking. Instructor's recordings are not authorized to be shared with anyone without the prior written approval of the instructor. Failure to comply with requirements regarding recordings will result in a disciplinary referral to the Dean of Students Office and may result in disciplinary action.

General Course Information

Crystal A Young
Department: Chemistry
Email: cayoung@uh.edu Try Teams First!**Office Hours**
Mon./Wed.: 1-3:00 PM, T/Th 2:30-3:30 PM

Your TA is the first point of contact for your questions pertaining to lab except for make-up lab requests (see Make-Up Policy).
Department: Chemistry
Office Hours
TBD

Course Objectives and Student Learning Outcomes

Organic Chemistry Laboratory II will build on the basic skills and operations of a synthetic organic chemistry laboratory and introduce advanced techniques. Stress will be placed on the identification and isolation of the products of common reaction types as well as use of Infrared and nuclear Magnetic Resonance Spectroscopy. To this end, we will develop the basic skill set introduced to you in Chem 2123 and extend the set to include advanced methods for the execution of reactions, isolation and purification of crude product, identification of pure product, and purification and identification of unknown materials. You will be introduced to advanced equipment used in the Organic Laboratory to safely carrying out reactions, isolation and purification of crude product, identification of pure product, and purification and identification of unknown materials. In addition, you will perform exercises in reaction evaluation and product purification using chromatographic methods as well as spectroscopic and chemical identification methods on purified products.

Discussion and Lecture Topics

please see

Course Schedule, Assignments, and Assessments

Course Policies and Procedures

Sections VI & VII & IX