

Syllabus Chem 9 Elementary Organic Chemistry Lab II
Spring 1998 TTh 10:30 am - 1:20 PS 77

Instructor J. Dekker

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Office hours M, T, Th 2:30-3:30 pm or by appointment

Textbooks

1. Brown Introduction to Organic Chemistry
2. Traynham Organic Nomenclature (5th ed)
3. Bettelheim and Landesberg Experiments for Introduction to Organic Chemistry. A Miniscale

Approach.

Materials

1. Required: A lab research notebook with double pages.
2. Required: Safety goggles.
3. Required: A scientific calculator
3. Optional but recommended: A lab coat.

Course objectives and outcomes Students will be familiar with safety procedures and lab equipment for semi-micro organic experiments. They will be capable of synthesizing and purifying organic compounds, of measuring melting points, refractive index, optical activity etc. They will also be able to identify unknown compounds by analyzing simple MS, IR, and NMR spectra. Through interactive computer programs the students will obtain support in thoroughly understanding the basic concepts of organic chemistry taught in Chem 8.

Homework Students are expected to come to lab well prepared. This means that the steps to be taken to properly complete the experiment are underlined in the lab manual or written down in the lab notebook ahead of time and that the pre-lab questions are answered. The theoretical explanations in the lab manual are typically too brief to fully understand the experiment. Therefore preparation reading Brown's text on the subject is appropriate.

Lab report This semester 2 experiments are finalized with a lab report using the observations and data collected in the experiment. The lab reports are essentially a write-up of the experiment and a research paper. The student will need to use resources in the library or use the internet, which is available for free in the organic chemistry lab, to find appropriate theoretical background information and this way she/he will fully comprehend the experiment.

Lab materials Expensive grounded glassware and other delicate lab supplies will be made available. Students will be held responsible for their own desk inventory.

Attendance Attendance at all labs is mandatory. Role will be taken every time. Students will have to complete all the laboratory assignments. You will be dropped if you miss two weeks without further notice and a W will appear on your transcript.

Grading To determine the final grade in this class the average of the timely submitted and neatly typed lab reports will count towards 60% and the individually graded labs towards 40% of your final grade.

We will also take into account the quality of the product, the working technique, and the efforts to reach the experimental goal and (sometimes) the quantity of the compound.

General grade break-off A 90% and up, B 80-89%, C 70-79%, D 60-69%, F 59% and lower.

Drop date The drop date is Friday MARCH 13, 1998. After that date a letter grade will have to appear on your transcripts.

Lab rules It is MANDATORY to use safety glasses at any time that you are in the lab.

You have to perform all the assigned experiments. If for whatever reason you have to miss a lab, you are accountable to inform the instructor ahead of time and make arrangements to make up the lab. This has to be done ASAP. The grade for a missed lab is a zero (0).

Copying of experimental data and answers to questions in lab reports is considered fraudulent behavior and will result in a zero grade for the copier and the originator.

Lab schedule Chem 9 Spring 1998
Every experiment takes 1-2 lab sessions.

Title of experiment

1. Check in inventory. Take Lab Safety Quiz. Sign the Safety Agreement.
2. Atomic and molecular orbitals lab.
3. Experiment 1. Structure in organic compounds.
Use of Molecular Models.
4. Experiment 2. The separation of the components of a mixture.
5. Experiment 3. Resolution of a mixture by distillation.
6. Experiment 4. Physical properties of chemicals: melting point, sublimation, and boiling point.
7. Experiment 5. Column and paper chromatography: separation of plant pigments.
8. Experiment 6. Isolation of caffeine from tea leaves.
9. Experiment 7. Identification of hydrocarbons.
10. Experiment 8. Dehydration of 2-methylcyclohexanol: an elimination reaction.

An addendum will follow with the remainder of the experiments.

Laboratory Report requirements for Chem 9.

A neat lab report will have to contain the following sections.

1. Abstract. A summary of the experiment of approximately 5 sentences usually written after completion of the report.
2. Experimental procedure. Provide a concise description how you prepared the compound. Do not copy the prescription in Wilcox, but stepwise write the experimental procedure you used.
3. Results. Present all numerical data including yields, melting points, refractive indexes etc. in simple tables including the dimension.
4. Discussion. This is the key part of the report. In the discussion section the theoretical background of the experiment has to be elaborated on. An in depth survey of the reaction mechanism is appropriate. Using various texts and research articles available through the library and in the lab the student has to make a comparison between the data found in the experiment and the ones in the literature.
5. Conclusions. Summarize the deductions of the work.
6. Bibliography. References will have to be published at the end of the report. Adding author(s) and title of the books, research articles including chapter, page and edition date completes the bibliography section properly.
7. Answer the questions of the hand out.

USE A P.C!!!!