CHEMISTRY 20L
Introductory Organic Chemistry Laboratory
Spring 2011

Instructor: Dr. Cynthia Kellen-Yuen

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Office Hours M,T: 12-1; W: 9-10 *or by appointment*

Faculty website: *www.csus.edu/indiv/k/kellen-yuenc/* ***SacCT site:*** *https://online.csus.edu*

Texts
- *Chemistry 20L Laboratory Manual (on-line through SacCT website)*
- *Organic Laboratory Techniques, 3rd ed.*, Fessenden, Fessenden and Feist (recommended but not required)

Required Materials Bound, lined laboratory-grade notebook (with page numbers), calculator, gloves and chemistry-grade laboratory goggles. A laboratory coat is highly recommended.

Prerequisites Successful completion of **or** concurrent enrollment in Chem 20

Course Description: Basic organic experimental techniques. Experimental topics include: melting points, purification of solids, distillation, gas chromatography, extraction, and functional group qualitative analysis. Specifically designed for Biological Sciences majors and others who want to meet the Chemistry minor requirements for a lower division organic laboratory.

Learning Objectives: Students will learn basic organic laboratory techniques, which will be utilized to prepare, separate, purify and identify organic compounds. Students will also learn some instrumental techniques (e.g. gas chromatography and/or infrared spectroscopy). Students will also be required to keep a laboratory-grade notebook, to explain their laboratory findings in writing, to perform basic calculations related to the lab, and to familiarize themselves with safety information sources.

***Student Responsibilities*:** Each student must download the experiment being performed or discussed during the lab period and bring the paperwork with him/her to class. Before starting any lab work, the student must familiarize him/herself with lab procedures, chemicals, equipment, hazards, safety procedures, and disposal procedures associated with the work being performed. Students are required to write up the lab experiment procedure in their notebook before beginning an experiment. If the instructor feels that a student is unprepared the student will be asked to leave. There are no make-up labs or make-up quizzes without prior approval by the instructor, and being unprepared for lab does not constitute an approved absence. Students are required to properly clean their work area before leaving lab or their grade on the performed experiment will be lowered.

***Attire*:** Students will always come to the lab in clothing appropriate to a chemistry lab. This means long sleeves, long pants and shoes that cover the foot. This is the best way to protect yourself in the case of a chemical spill. A lab coat or lab apron is a wise investment since it also protects your clothing. **STUDENTS WILL WEAR CHEMICAL-GRADE LABORATORY GOGGLES AT ALL TIMES IN THE LABORATORY. THERE ARE NO EXCEPTIONS.** Any student who must be repeatedly warned to put on his/her goggles will be told to leave the class. **Contact lenses should never be worn in a chemistry laboratory**.

Attendance: This lab meets only once a week. Thus, if you miss one lab period, you have missed one week of class! Attendance will be taken every lab period. You are allowed one unexcused absence; two or more will result in a failing grade in the class.

Experiments: The experiments to be performed this semester are listed below along with the basic time-line for the semester. These experiments and or the timing of the experiments may change depending upon the needs of the class. Check for the up-dated schedule on SacCT during the course of the semester.

Date	Experiment/Activity	Reading in Text
1/24	Intro, Check-in, and lectures	P. 1-22
1/31	Melting Points (20 pts)	P.39-48
2/7	TLC of Analgesics (20 pts)	P. 133-140
2/14	Isolation of Analgesics (20 pts)	P. 119-132
2/21	Quiz #1, Catch-up and lectures	
2/28	Nitration (20 pts)	P. 153-159, 23-38
3/7	Nitration continues	
3/14	S_N1/S_N2 analysis (20 pts)	
3/21	**Spring Break—No Classes**	
3/28	Carvone (20 pts)	P. 77-92, 107-110
4/4	Lecture and Carvone continues--spectroscopy	P. 163-178
4/11	Quiz #2, Qualitative Analysis of Alcohols and Alkenes (20 pts)	
4/18	**No Class**	
4/25	Benzocaine Synthesis and Isolation (20 pts)	P. 49-67, 71-74
5/2	Benzocaine continues	
5/9	Quiz #3, Clean-up and check-out	
	Final Exam—Friday May 20, 8-10 am	

Grading*:* Your grade for the course will be based on your experiment points, quizzes and final exam, your laboratory notebook, and your laboratory technique throughout the course of the semester (see below for instructions on keeping a laboratory notebook).

Experimental points	160
Lab book and technique	50
Quizzes (3)	75
Final	100
Total	385 pts.

Letter grades are assigned based on a range of: A to A- = 90.0% and above, B+ to B- = 89.9-80.0%, C+ to C- = 79.9-70.0%, D = 69.9-60.0%, F = below 60.0%

Cheating and Plagiarism: Plagiarism and cheating are strictly forbidden and will result in a ZERO GRADE. This includes submission of any work which is not your own, falsification of lab data, use of old laboratory reports (yours or someone else's), copying from another student's report (**yes, even lab partners must have their own unique answers**), reporting data for an experiment you did not perform, using extra materials during testing, programming data into a calculator, having other people take tests for you, altering exams after they have been graded, etc. While it is acceptable for your initial data numbers to be the same as your partner's, we expect each student to be capable of thinking for him/herself. As such, identical answers (in word or structure of calculation problems) will be considered evidence of cheating.

Cleanliness in Lab: Due to problems encountered in previous classes, students are warned that they are directly held responsible for the cleanliness of the lab, since messy labs pose hazards to the students and add costs to the department in terms of clean-up time and wasted chemicals. Therefore the

instructor can fine every student in the class up to 5 points per day if the laboratory room is found to be messy or unsafe. Students are encouraged to remind each other to clean up their areas to avoid losing points. If any student notices that one of their lab mates is not following the rules, they should report this to the lab instructor immediately. Students will be required to ensure that the lab room is clean before leaving for the day.

Laboratory Notebook: (see also text pp. 8-22)**.** The correct notebook for the lab is a hardcover, bound notebook containing lined pages. A loose-leaf or spiral notebook is not satisfactory because pages are easily removed and lost. If the pages are not numbered, number them before using the book. Make sure you write your name, address, and telephone number or some type of contact information on the inside cover, in case it is lost. Record your locker number and combination of your locker in your lab book or in some convenient place. Leave one page at the front of the lab book for a table of contents. Enter each of the experiments consecutively—do not skip around. All data will be recorded in permanent ink as it is collected. NEVER ERASE IN A NOTEBOOK. If an error is made, ONE line is drawn through the mistake. DO NOT SCRATCH OUT ERRORS AND DO NOT RIP OUT PAGES FROM THE LAB BOOK. Points will be deducted for illegible notebooks, however it is understood that the only "perfect" lab book is one that has been copied. Make sure your work is neat and easily followed.

The lab book will include:

- A table of contents (with page references)
- Each experiment should have its own separate page(s) which will include:
  - Title of experiment
  - Page number
  - Date
  - Outline of the procedure being performed
  - A hazard table listing the name, structure mp/bp and any important toxicity data (ex. LD_{50}) for each chemical being used in the experiment. Note: this data can be found in "Hazardous Properties of Industrial Materials" edited by Sax or in any standard list of Material Safety Data Sheets (MSDSs). Both can be found in the 5th floor Service Center; the Sax book is in the reference section on the 3rd floor of the Library; and MSDS information can be found on-line (for example from Sigma-Aldrich or Fisher)
  - Data table/place where data is recorded as the experiment is conducted---DO NOT WRITE DATA DIRECTLY ON THE LAB REPORT DURRING LAB TIMES
  - Results and observations of what happened during the experiment (this would include exact amounts of chemicals used, color changes, etc.
  - Your conclusions
- Remember that you will be turning in the lab report form for grading, however you will have the lab book and all of your notes to use in studying for the quizzes—Make your notes thorough and complete!!

Laboratory Reports: Each experiment includes a lab report form. You are NOT to record data directly onto the lab report form—it goes into the lab notebook. The data from the notebook is then used to complete the lab report form (this ensures that your lab report form is neat and that you always have a copy of the data in case anything should happen to your lab report form). Graphs, spectra, or other papers that might be generated in the lab should be attached to the completed lab report form for submission to instructor.

Lab Reports are due the week after the experiment is completed, at the BEGINNING of the lab period. Late reports lose 10% of the grade for every day they are late. Lab reports are NOT accepted after the graded reports have been returned to the class.