

Syllabus Chem 29A Organic Chemistry Laboratory
Kings River Community College Fall 1997

Chem 29A meets: TTh 10:30 am - 1:20 in PS 77

Instructor : J. Dekker.

Office : PS 78 # (209)638.3641 ext 353

Office hours : M 2:00-3:00, T Th 2:30-3:30

Course objectives and outcomes. Students will become familiar with safety procedures and lab equipment for semi-micro organic experiments. They will learn how to synthesize and purify organic compounds. They will also be able to identify unknown compounds by analyzing MS, IR, and NMR spectra. Through interactive computer programs such as B. Luceigh, Organic Chem TV the students will obtain support in thoroughly understanding the concepts taught in lecture (Chem 28A).

Textbooks

1. Svoronos/Sarlo Organic Chemistry Laboratory Manual (2nd ed)
2. McMurry Organic Chemistry (4th ed)
3. Traynham Organic Nomenclature (5th ed)

Required materials

1. Jones and Bartlett Lab Research Notebook.
2. A white lab coat.
3. Safety goggles.

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 text of Svoronos/Sarlo or written down in the lab notebook ahead of time. The theoretical explanations in the lab manual are typically too brief to fully understand the experiment. Therefore preparation reading McMurry's text on the subject is appropriate. At the end of each experiment a brief lab report including answers to post lab questions is submitted to the lab instructor.

Lab report Three experiments are finalized with an extensive lab report using the observations and data collected in the experiment. The lab reports are essentially a write-up of the experiment and also a research paper. The student will have to go to the library to find appropriate theoretical background information and this way she/he will fully comprehend the experiment. It will be encouraged to use Internet resources. Each student will have easy access to the Internet in the lab.

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. If the student misses two weeks of lab without prior notification of the instructor she/he will be dropped.

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 (occasionally) 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, October 17, 1997. 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.

Every experiment takes 1-2 lab sessions.

The chapters are referring to Svoronos' Lab Manual (2nd ed.)

Week of	Assignment
8/18	<ol style="list-style-type: none">1. Check in Desk Inventory. Read the Preface of the Lab Manual and read Chapter 1 pgs 1-3. Take the Lab Safety Quiz. Get familiar with MSDS sheets.2. Molecular Orbital Lab (refer to hand-out). Read Ch 3 pgs 19-21 and do experiment 3.1 C.
8/25	<ol style="list-style-type: none">1. Melting Point. Read Ch 3 pgs 19-21 and do experiment 3.1.C.2. Refractive Index. Read pgs 26-28 and do experiment 3.3.
9/1	<ol style="list-style-type: none">1. Simple Distillations. Read pgs 29-31 thoroughly. Do experiment 4.1 part I and part II.2. Fractional distillation. Read pgs 31,32 and do experiment 4.2.
9/8	<ol style="list-style-type: none">1. Extraction. Read pgs 63,65 and do experiment 6.2.2. Recrystallization. Read pgs 66-69 and do experiment 6.3 Do experiment 6.5 Isolation of Caffeine from Tea.
9/15	Stereochemistry and Molecular Models. Read Chapter 2 and answer the assigned questions. Build models using your kit and use the computer programs pertaining to Lewis structures and Molecular Modelling. Use the Organic Chem TV CD-ROM program: Structure, Section 8 Introduction to Stereochemistry and Section 9, Diastereomers.
9/22	<ol style="list-style-type: none">1. Equilibrium Constant. Read Ch 7 pgs 78-80. Do experiment 7.2. The Sodium Fusion Test. Read Ch 8 pgs 83-85 and do the tests assigned by your lab instructor.
9/29	<ol style="list-style-type: none">1. Synthesis of Cyclohexene. Read Ch 10 pgs 123-125. Do experiment 10.1.2. Continue with experiment 10.2: the Syn Addition of Cyclohexene.
10/6	Synthesis and Reactions of Acetylene. Read Ch 11 pgs 141-143. Do experiment 11 followed by the Qualitative Tests of Hydrocarbons and Alkyl Halides.
10/13	<ol style="list-style-type: none">1. Alkyl Halides. Read Ch 13 pgs 151,152 and do experiment 13.1 The Synthesis of t-Butyl Chloride.2. Read pgs 154-156 and do experiment 13.2, the Solvolysis of t-Butyl Chloride.
10/20	<ol style="list-style-type: none">1. Read Ch 13 pgs 163-173 and do experiment 13.3. Structural, Solvent and Temperature effects on Nucleophilic Substitution Reactions.
10/27	<ol style="list-style-type: none">1. Alcohols. Read Ch 14 pgs 175-179. Do experiment 14.1 The Grignard Reaction.2. Continuation of The Grignard Reaction.

- 11/3 1. Read Ch 14 pgs 180-183 and do experiment 14.2
Qualitative tests for Alcohols.
2. Read pgs 185-187 and do experiment 14.3. Preparation
of phenacetin from acetaminophen.
- 11/10 1. Stereochemistry in More Depth. Read Chapter 2 on the
R/S designation, Fischer projection formulas and meso
compounds. Read McMurry Ch 9 and do the assigned
problems.
2. Introduction to Mass Spectroscopy. Refer to the hand-
out. Use the computer programs in the lab.
- 11/17 1. Introduction to Infrared Spectroscopy. Read Ch 9.1 pgs
89-92. Analyze the assigned spectra using the computer
simulation programs.
2. Introduction to Nuclear Magnetic Resonance
Spectroscopy. Read Ch 9 pgs 105-109. Refer to the
hand-out and use the NMR simulation programs.
- 11/24 1. Analysis of unknown compounds by combination of IR and
NMR spectra.
2. Aromatic reactions. Read Ch 15 pgs 188-191 and do
experiment 15.1 Nitration of Bromobenzene.
- 12/1 1. Friedel-Crafts Alkylation. Read Ch 15 pgs 192,193
and do experiment 15.2.
2. Synthesis of 2,4-Dinitrophenylaniline. Read pgs
195,196 and do experiment 15.3 A Nucleophilic Aromatic
Substitution.
- 12/8 1. Synthesis of Tryptycene. Read pgs 200-203 and do
experiment 15.5.
2. Complete labs and lab reports. Turn in desk inventory.

There are no labs on T 11/11 and Th 11/27

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Laboratory Report requirements for Chem 29AB.

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 from the Lab Manual, but stepwise write the experimental procedure you have used.
3. Results. Present all numerical data including yields, melting points, refractive indexes etc. in simple tables. Include the proper units.
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. Use the Internet as a resource for your report.
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. Correct Internet addresses have to included in this section.
7. Answer the questions of the hand out.

USE A P.C!!!!

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