

CHE 310-L-017
ORGANIC CHEMISTRY LABORATORY
Fall 2008 M; 2-5 Room SC 465

Prerequisite: CHE 121 and 121L
Pre or Co-requisite: CHE 310 Lecture

Note carefully: students who withdraw from 310 lecture must withdraw from 310-lab; if they do not, they will be withdrawn from the lab by the instructor.

Dr. Robert J. Kempton
Office: SC 450
Phone: 572-5116; E-Mail: Kempton@NKU.edu
Office Hours: *Open-door policy and by appointment*

Text: "Techniques in Organic Chemistry," Second Ed., J. R. Mohrig *et al.*
"Organic Chemistry I Laboratory Supplement" (Pages must be downloaded from the department's website and studied **before** the lab: www.nku.edu/~chemistry/che310l.htm)

Equipment: Safety glasses
Laboratory research notebook

LABORATORY SCHEDULE

DATE	EXPERIMENT
08/25	Check in / Melting Point
09/01	labor day; no lab
09/08	Recrystallization
09/15	Unknown-Purification and Identification
09/22	Fractional Distillation
09/29	Acid-Base Extraction
10/06	Thin-Layer Chromatography
10/13	Column Chromatography
10/20	Fall break; no lab
10/27	Molecular Modeling
11/03	MID-TERM EXAM
11/10	Nucleophilic Substitution (S _N 1)
11/17	Bromination/Stereochemistry
11/24	Dehydrohalogenation
12/01	Carbocation Rearrangement
12/08	FINAL EXAM (covers entire semester) / Check out

Note: During quizzes and exams calculators may be used, but not shared.

All students are governed by the NKU student Honor Code. Among other things, copying information (answers to questions, mechanisms, etc.) from a current or former student's lab report is a violation of the Honor Code.

THERE ARE NO MAKE-UP LABS

ORGANIC LABS

GRADING SYSTEM

It is expected that each student enter the lab with a very good understanding of the theory behind the lab experiment and sufficient knowledge of the procedure so that he or she can begin working immediately.

Each student is also expected to know how to set up and perform the basic techniques in organic chemistry lab (melting points, distillation, extraction, and recrystallization). The instructor will, in general, not answer questions about these techniques **once they have been performed**.

The pre-lab lecture will consist of a brief review of the theory behind the experiment, safety features, and changes in the experimental procedure, if any.

Grading of your lab reports will be based on your write-ups (completeness, clarity, brevity, sentence structure, style, and format), observations, conclusions, calculations, and yield and purity of products. These lab report grades will represent about 45% of your final grade. A written mid-term and final exam will be given. These tests will represent about 40% of your final grade. Pre-lab quizzes will be given occasionally. They will represent about 15% of your final grade. In the past, students who have obtained greater than ca. 83% of the total points in the lab have received an **A**; between ca. 71-83% **B**; between ca. 56-71% **C**; less than ca. 56% **D**; less than ca. 48% **F**.

Notes: 1. Lab notebook write-ups are due at the end of every lab; hand in the original to the instructor.

2. Lab supplement data sheets are due at the very beginning of the following lab period.

This Syllabus Subject to Change
The Laboratory Notebook

One of the objectives of this course is for you to learn to keep a proper laboratory notebook. The lab notebook serves as a permanent record of your work. A well-kept notebook is imperative in research in graduate school or industry since it may provide evidence of discovery for patents, publication, etc. If the notebook is properly written, any chemist who reads English should be able to repeat the experiment and get the same results as you did. *This is the essence of science.* Accordingly, the following precepts for your notebook must be observed:

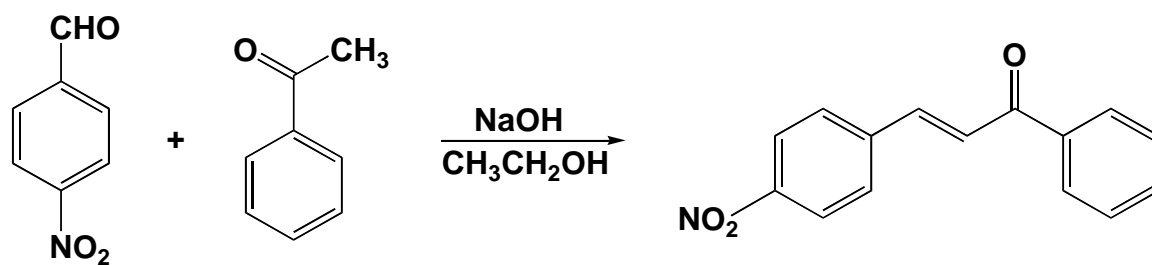
1. All entries must be made in **ink**, preferably black. Do not use pencils. No entries or data should be recorded on scrap or loose leaf paper, but entered directly in the book. The lab notebook must be bound, not loose leaf, and have consecutively numbered pages. No pages should be torn from the book.
2. Each experiment should have a fresh page, which is dated and has the title of the experiment.
3. Entries should be in the **past tense**. The impersonal tone is required. Example – Benzoic acid (1.6 g) was added to 50 mL of 5% aq. sodium bicarbonate. Effervescence was observed as the sample dissolved. NEVER – “I added 1.0 gram . . .” or “Added 1.0 gram . . .”
4. The narrative should state *what you did and what you observed*. It should be entered as close in time as possible to the procedure being performed, not at the end of the lab and definitely not after the notebook has left the lab.
5. If you generate material that does not fit readily into the narrative (spectra, chromatographs, pictures), these should be referenced in the notebook and attached by staple.
6. Any calculations should be summarized (in ink, of course) in the notebook. Lists, tables or charts may be appropriate.
7. There should be no erasures. Corrections should be made by drawing a single line through the mistake, then writing the correction.
8. A reasonable conclusion based on your experiment should be found at or near the end of your write-up.
9. Following these instructions may lead to a less than pristine lab book. That is ok. Spots, stains, etc. only indicate that the book was used as intended.

You should obtain the laboratory notebook sold with the other chemistry books in the bookstore. This particular book makes copies as you write. At the end of the lab period your narrative containing *what you did and what you observed* should be complete. Hand in the original to me at the end of the lab period; keep the copy for your records. Prior to the following week's lab complete the data sheet that you downloaded from the Department's website. The data sheet is due at the beginning of the following lab.

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SAMPLE LAB NOTEBOOK WRITE-UP

Reaction Equation:



Procedure:

3/21/08

p-nitrobenzaldehyde (0.1081g; 0.715 mmol) was weighed into a thick-walled test tube, followed by 4 mL of 95% EtOH and 0.103 mL of acetophenone (0.100g; 0.80 mmol). The material was dissolved by warming in a hot water bath and then cooled in an ice bath in a beaker. After cooling 0.4 mL of 10% aq NaOH was added dropwise via syringe. After 10 min., an orange precipitate began to form. After an additional 15 min. precipitation appeared to be complete. The supernatant was pipetted off and the solid allowed to settle again. The product was washed 3X with 80% EtOH, with the solvent pipetted off each time. The product was air dried.

3/28/98

The yellow, amorphous solid weighed 84 mg (47%). The melting point was 160.4-162.0 °C. Based on the melting point of the product compared to literature value the desired product was formed.