CHEMISTRY 333: ORGANIC CHEMISTRY LAB II

Spring 2017

COURSE INFORMATION

Instructor: Dr. Doug Klumpp
Teaching Assistant: Sami Varjosaari (svarjosaari@niu.edu)
Lab Time: We 2:00pm-4:50pm (Section L002) or Th 6:00pm-8:50pm (Section L004)
Lab Location: Faraday 307
TA Office Hours: We 10:00am-11:00am and Th 5:00pm-6:00pm Faraday 345
Required Text Gilbert, J.C. and Martin, S.F. *Experimental Organic Chemistry, A Miniscale and Microscale Approach*, 4/5/**6**th Edition.

SAFETY

Safety is the number one priority in the organic laboratory, since all chemicals are toxic to varying degrees. **ALL STUDENTS MUST WEAR EYE PROTECTION AND CLOSED-TOE SHOES AT ALL TIMES during the class. Leg coverings are also required.** Goggles are available free of charge at the chemistry stockroom, and they must be the type approved by the Chemistry Department. No food or drinks are permitted in the laboratory. Waste chemicals must be properly disposed. Notify TA of any glassware breakage, chemical spills, or emergencies immediately. Your lab area, lab equipment, etc. must be cleaned prior to leaving the lab. Refer to the textbook for a more comprehensive discussion of safety. The Department of Chemistry has a zero tolerance policy for safety violations, and points will be deducted for violating the safety rules (see the section on grading). Pregnant students should consult with their doctors regarding the risks of being enrolled in this and other laboratory-based classes.

CLASS ATTENDANCE AND GENERAL ADVICE

Regular attendance is essential for a successful and pleasant experience in organic chemistry laboratory. Lab starts promptly at the appointed: do not be late. You must attend every lab session unless you have a university-sanctioned excuse, of which you have to inform your TA in advance. If for some unforeseen reason you will not be able to attend lab, please alert your TA as soon as possible. **There will be no make-up labs**, and unexcused absence during a lab will result in a zero for that experiment. Note that some labs may require multiple periods; you must attend all sessions to receive credit for the experiment. **The use of technology of any kind (e.g. phone, computer, tablet) in lab is prohibited unless previously approved by the TA or instructor.**

PRE-LAB PREPARATION

Read all the material in the textbook pertaining to the lab before showing up to class. Note for that for several early experiments you are also required to read the corresponding technique section in Part VI of the book (see schedule of experiments). There are no formal pre-lab questions to do for the laboratories, but there are post-lab questions, which you are supposed to answer after you have completed the experiment.

LABORATORY AND REPORTS

During the laboratory, your data should be recorded into a laboratory notebook (in ink), and the **data pages must be signed by the TA prior to your departure from lab**. Laboratory notebooks must be kept neat and must have duplicate, numbered pages. Regular paper notebook pages or composition notebooks are not acceptable. Lab reports should be in your own writing, and copied lab reports will receive a grade of zero. Even though you may conduct your experiments in pairs, the lab reports, including all calculations and answers to questions, should be prepared individually. The reports should be written neatly and legibly in

black or blue ink. Pencils, white out, or colored pens (other than black or blue) are not permitted or acceptable for your notebooks. Lab reports are due at the beginning of the following lab period after an experiment is completed (multiple-period labs will be due the next lab period after completion) as indicated in the schedule of experiments. The following information should be included:

To be prepared before lab

1) Name, Date, and Experiment Title (e.g. "Recrystallization of Sulfanilamide").
2) Purpose. A brief summary of what you are trying to accomplish and/or learn from this experiment, (not just a restatement of the title). List methods, etc.
3) Data. Include all information pertinent to the experiment, including any and all safety hazards; MSDS sheets can be found at http://www.hazard.com/msds/index.php. For example, if you are recrystallizing sulfanilamide, you would want to draw the chemical structure, list important physical properties (such as melting point), and note any safety hazards associated with the compound. The mechanisms of any reactions must be shown. Include equations and quantities of materials needed.

To be recorded in lab

4) Procedure. The procedure performed during the lab on that day and observations, such as color changes, formation or disappearance of a precipitate, evolution of heat or gas, etc.
5) Results. Weights of the products, melting point ranges, etc. Theoretical and percent yields should be calculated if it pertains to the experiment. **Obtain TA's signature at this point**.

To be written after lab

6) Conclusions. A brief, but informative conclusion to the lab stating the results obtained and discussing the possible reasons for those results. Mention possible errors, and how they could be avoided in the future. This may improve your techniques for later experiments.
7) Answers to post-lab questions. See schedule of experiments for the list of questions.

QUIZZES AND EXAMS

There will be five pre-lab quizzes (see the schedule of experiments), each mainly about the experiments performed since the previous quiz. Tardiness to a quiz will result in a zero for that quiz. There will be no make-up quizzes. Your lowest grade on a quiz will not factor into your final grade. During the last class period, there will be a written final exam consisting of multiple choice and short answer questions.

GRADING

Your grade in organic laboratory is largely based on the work done performing the assigned experiments and understanding the techniques/procedures. The lab reports will be graded based on the quality of your data, your presentation of the results, and your answers to post-lab questions. You must prepare your report individually, and violation of this rule will result in zero points for both laboratory partners. **A penalty of up to 10 points/day will be deducted from late lab reports.**

Following safety rules is an important part of any lab work, thus points may be deducted for violations:

Goggles/shoes not being worn (at all times except pre-lab discussion)	(20 points)
Chemical spill not cleaned (near balance, at your work area, in fume hoods)	(10 points)
Food/drink in lab	(5 points)
Improper waste/glass disposal	(10 points)

Points Calculation

Lab Reports (10x80)	=	800 points
Quizzes (4x25)	=	100 points
Final Exam	=	100 points
Total Points	=	1000 points

Approximate Course Grading Scale

A	900 – 1000 points
B	800 – 899 points
C	700 – 799 points
D	600 – 699 points

SCHEDULE OF EXPERIMENTS

Lab Date	*Quiz*	*Experiment Number and Title*	*Post-Lab Questions*	*Due Date*
Jan 25/26		*Check In*		
Feb 1/2		*Experiment 15.5* Relative Rates of Aromatic Substitution	11, 12, 13	Feb 8/9
Feb 8/9		*Experiment 16.2* Oxidation of Cyclododecanol to Cyclododecanone	2, 5, 7	Feb 15/16
Feb 15/16	**#1**	*Experiment 17.4* Reduction of 9-Fluorenone	1, 2, 5	Feb 22/23
Feb 22/23		*Experiment 18.2* The Wittig Reaction	1, 3, 4	Mar 1/2
Mar 1/2	**#2**	*Experiment 19.4* Reaction of Grignard Reagents	1, 5, 6	Mar 8/9
Mar 8/9		Synthesis of Aspirin*		Mar 22/23
Mar 15/16		*No Class (Spring Break)*		
Mar 22/23	**#3**	Preparation of Isopentyl Acetate (Banana Oil)*		Mar 29/30
Mar 29/30		Preparation of 3-Nitrobenzaldehyde (Aldol Condensation)*		Apr 5/6
Apr 5/6	**#4**	Preparation of Nylon (Polyamide)*		Apr 12/13
Apr 12/13		Synthesis of Luminol*		Apr 19/20
Apr 19/20	**#5**	Check Out/Review		
Apr 26/27		**FINAL EXAM**		

***These labs are not in your textbook and will be distributed as handouts and on Blackboard.**