General Laboratory Information

Lab instructors:

Wallace Fu
Merrill **525;** 542-**5416**
wfu@amherst.edu
Office hours: Mon 3 - 4:30p;
Tues 1 - 2p; Thurs 1 - 2p

Gary J. Snyder
Merrill **519;** 542-**2648**
gsnyder@amherst.edu
Office hours: Tues 4 - 7p
Wed 12n - 1p; Thurs 9 - 11a

The laboratory period starts with a pre-lab lecture in Merrill 430. These sessions will normally be short, but jam-packed with useful and important background info on the day's experiment and associated safety considerations. Therefore it is imperative that you attend these sessions and be there on time. Students who miss the pre-lab lecture or fail to do the required pre-lab write-up (see below) may not be allowed to start the experiment until doing some sort of appropriate penance, e.g., writing a short essay on safety, explaining the experimental principles to the instructor, tracking down the necessary data, or running laps around the building. After the pre-lab lecture we will move to the organic lab, Room 421.

At the beginning of the semester there may be an opportunity for students to switch lab sections if space is available. Please see Dr. Snyder if you need to register for a different lab section. Once you're registered for a section, you must attend that section unless you make other arrangements *in advance*. Because Professor Fu will be teaching most of the lab sections, please contact him if you need to attend a different lab section in a particular week.

You will find a schedule of experiments on the next page of this handout. Before each lab you will need to read the experimental procedure and any supplemental material provided, look up relevant molecular structures or physical data, and complete a short pre-lab write-up, in your notebook, following the guidance provided by the experiment hand-out. The duplicate notebook pages containing the pre-lab write-ups will be collected at the beginning of the pre-lab lecture period.

Record-keeping and lab reports. ***Data and observations must be entered directly into your notebook*** *and must be clear and legible*. For some experiments your data and short answers to the questions posed in the experiment hand-out will constitute your entire "lab report", and this will be turned in at the end of the period; for other experiments, a more complete write-up outside of lab will be required, and the report will be due at the beginning of the following period. In these cases, any data analysis and discussion sections that you write outside of lab may be typed or hand-written.

Intellectual responsibility. Your education is a product of your own intellectual effort. Thus, it is imperative that all work submitted — pre-lab write-ups, lab notebook pages, and lab reports — be entirely your own! Under no circumstances is it acceptable to copy (transcribe) material from your lab partner or another student. Of course, you are strongly encouraged to discuss the experiments with others in the lab and outside; however, what you turn in *must be your own work*, not the product of a group effort.

Schedule of Laboratory Experiments

Week	*Experiment*
01/25	**No labs**
02/01	**11** Infrared Spectroscopy
02/08	**12** Spectroscopy problems — dry-lab
02/15	**13** Dynamic NMR — dry-lab Note — *in-class exam on Friday February 19*
02/22	**14** EAS — Friedel-Crafts Alkylation
03/01	**15** To be announced (EAS?)
03/08	**No Labs** Note — *evening exam on Wednesday March 10*
03/15	**No Labs** — *Spring Break*
03/22	**16** Grignard Reaction — Preparation of Triphenylmethanol
03/29	**17** Polymer Chemistry — Nylon and PVA-silicate Note — *in-class exam on Friday April 02*
04/05	**18** Preparation of Esters
04/12	**19** Aldol Condensation
04/19	**No labs** Note — *evening exam on Thursday April 22*
04/26	**20** Pericyclic Reactions
05/03	wrap up and **Check out**
05/10	Final Exam period.

Safety and Basic Laboratory Practices

Here are a few simple guidelines for ensuring that your work proceeds safely and efficiently and that the laboratory stays reasonably neat and clean.

Safety goggles MUST be worn at all times. Even it you think that what you're doing is not hazardous, you don't have the knowledge or experience to decide when it's not necessary to wear eye protection. And even if you're doing nothing but writing in your notebook, someone near you may be doing something dangerous. This goes for everyone in the lab at all times. In particular, you must have goggles on when you're cleaning up, *especially when dumping waste and rinsing stuff into the waste containers*.

Gloves are required *when working with chemicals* in the organic lab. A variety of latex and nitrile gloves are available. If your gloves get torn or contaminated, throw them out and get a new pair. To keep from exposing others to chemical hazards, gloves should never be worn outside the laboratory. Before you leave the lab — even if only for a minute — remove your gloves and wash your hands.

Clothing. Come to lab dressed so that you don't endanger yourself. Full-length pants or skirts with proper shirts and footwear must be worn to limit chemical exposure in case of spills. This means that you MUST wear closed-toed shoes, not sandals or crocs. Sneakers are fine. Shirts, t-shirts, or something more substantial must cover the entire upper portion of the body. You must not wear shorts, halter tops, spaghetti strap tops, etc to lab. Exposed abdomens, hips and backs are not safe in the lab. Long hair must be pulled back and properly restrained. **You will be sent back to your dorm room to change if you do not have the proper clothing.**

No food or drink is allowed in lab. This means no coffee, no water bottles, and no gum. You are welcome to use the lounge (Room 418) if you need to take a break.

Fume hoods are available in the lab for work involving inhalation hazards. The bottom of the sash must not be raised above the green dot on the side of the hood, and all material must be at least 6 inches back from the sash opening. The doors to the laboratory must remain shut when fume hoods are in use to ensure proper air flow.

In case of an accident, tell your lab instructor or TA immediately! He/she will assist you. If for some reason the instructor cannot be immediately located, the Stockroom Coordinator and Chemical Hygiene Officer, and Departmental Safety Czar, Dr. Kristi Evenson-Ohr (Merrill 428, x2736) should be notified. The emergency line for Campus Police is x2111; there are phones in the 4th floor hallway and in the stockroom. In addition, the College's chemical safety policies can be reviewed online at http://www.amherst.edu/~ehs/

The lab is equipped with the following safety equipment — be sure to locate these items during your first lab period.

- ***Safety showers***, located in the front of the room by the doors, are available in case you spill a large amount of a hazardous chemical (especially concentrated acid or base) on yourself. Remove contaminated clothing and flush the affected area thoroughly until help arrives.

- ***An eye wash*** is located in the front of the room. If you get chemicals in your eyes, flush them in the eye wash for at least 15 minutes.

- If you in a position to assist someone with the safety shower or eyewash, *first ensure your own safety* (i.e. be sure you have not been exposed to the hazard and you're wearing gloves and goggles so that you don't become exposed).

- A ***fire extinguisher*** located near one of the front doors in the laboratory. Your instructor or TA will use this if appropriate to extinguish small fires. In the unlikely event that no instructor, TA, or other authorized person is available, do not try to extinguish the fire. Alert everyone in the lab to evacuate, close the lab doors to contain the fire, pull the nearest fire alarm. If you need to evacuate the building because of a fire alarm, we will *meet in the brick courtyard outside the front entrance of the building.* This is important because your lab instructor will need to make sure everyone is safe and accounted for.

- A ***first-aid kit*** is mounted along the back wall of the lab for minor injuries.

- ***Brooms and dustpans*** are in the front of the room for broken glass.

- ***In the event of a significant spill*** notify the lab instructor or TA. Small spills (<100 ml) of non-hazardous material can be cleaned up; larger spills require the assistance of trained personnel. If in doubt, ask.

- *In the event of an accident that requires the use of a shower or eye wash or a major spill, notify campus police* ***x2111****. If possible, report the identity of the chemical(s) involved, and get the MSDS from Merrill 506.*

Waste Disposal: Nothing goes down the drain except water and soap. Do your best to minimize the amount of chemical residue in the trash or glass waste containers. Use the chemical waste containers in the hood in the back of the lab. Material adhering to the glass can be rinsed into the containers with water or the organic solvent provided. Be sure not to fill the containers beyond about 80% of their capacity. If a waste bottle looks too full, say something.

Paper towels or gloves that are *heavily contaminated* with chemicals should be placed in a labelled solid waste container. If none is present, ask your instructor or TA, or get a container and label from the stockroom.

Routine trash goes in the black rubber trash cans. ***Glass, whether broken or not, must NEVER be placed in the regular trash***. This creates a serious hazard for custodial personnel.

Do not throw broken mercury thermometers into the glass waste! Mercury is quite toxic and must be disposed of properly. If you break a mercury thermometer, tell your instructor or TA immediately. There are special Hg-spill kits for just such an occasion.

When inserting a ***thermometer or glass tubing*** into a rubber stopper, lubricate the glass with water, soap, stopcock grease, or glycerine, and push gently with a twisting motion. NEVER force it. It's a good idea to protect your hands with heavy gloves or a towel just in case.

Never use a flame unless specifically told to do so, and then ONLY if no flammable materials are anywhere in sight. That includes lab notebooks, paper towels, other students, and the instructor. Organic labs normally contain large amounts of very flammable solvents and other chemicals, and using an open flame is inviting disaster.

General laboratory hygiene. In the interest of everyone's health and safety, please keep your work space neat and free of spilled chemicals. Keep the hoods, balance areas, and other common areas clean. Keep chemical containers capped when not in use, and be careful not to contaminate reagents.

Never take chemical samples out of the lab. Although the compounds you will be making and working with in this course are not especially hazardous, all chemicals need to be treated with respect. In addition to causing disposal problems, taking samples out of the lab creates the potential for accidental exposure and unpredictable responses by individuals who know nothing about chemistry or chemical handling.