Chemistry 123: Principles of Chemistry **Carleton College**
Labs 52 and 57 **GENERAL INFORMATION (Lab Syllabus)** **Winter 2003**

Principal Investigator ("P.I.")

Rob Rossi Favorite Hangout: 167 Mudd Phone: Extension 7145 e-mail: rrossi@carleton.edu

"Principal Investigator" is what funding agencies call the person to whom they award grant money earmarked for a specific scientific purpose. Said individual is responsible for spending their money, and he or she is also responsible for getting the results promised in the grant proposal. If the science doesn't get done, it's the P.I.'s head they want on a platter. Many established P.I.'s spend so much time and effort writing grants and performing administrative duties that they loose touch with current laboratory techniques. The wise graduate student learns to hide his or her experiment when the P.I. comes strolling by, lest the elder scientist pretend to know what (s)he's doing and quickly ruin many weeks of work by fiddling with their fragile experimental setup.

The Key to the Chem 123 Universe

Julie Karg Favorite Hangout: 264 Mudd Phone: Extension 5933 e-mail: jkarg@carleton.edu

Julie is the difference between wanting, and having it all. She oversees the chemistry stockroom during our lab periods and is the person to turn to when you need lab equipment or chemicals. Be very nice to Julie!!!

Teaching Assistants ("TA's")

Sarah Martinson ['04 Poly Sci/IR]	Tuesday Morning 8a – noon	martinss@carleton.edu
Mike Baca ['04 Chemistry]	Tuesday Morning 8a – noon	bacam@carelton.edu
Margaret Lo ['04 Chemistry]	Tuesday Morning 8a – noon	lom@carelton.edu
Sean O'Reilly-Jones ['05 Undec.]	Tuesday Afternoon 1p – 5p	oreillys@careltonn.edu

The lab TA's are fellow students who also happen to be laboratory veterans. They will be around during the lab periods to help you figure out what's going on and what you should be doing. Don't be shy about asking them (or me) questions! The TA's will also help grade your laboratory notebooks, and help you improve them.

Lab Manual

There's a printed lab manual with a nifty blue cover for the 123 Lab. It costs $3. Copies are available from Julie in the chemistry stockroom, 262 (via 264) Mudd. Julie is around afternoons on M/W and all day on T/Th. Copies can also be obtained from Brian Mars, when he's in his office in 271A Mudd. **Please pick up a copy of the lab manual before Tuesday, if at all possible. Read pages 1 – 17 before coming to the first lab period.**

References

Your course textbook (Zumdahl) has a lot of helpful information relevant to lab. In the "Pre-Lab Preparation" section of each lab, there's usually some assigned reading related to the lab, as well as a pre-lab assignment.

Another good reference for the lab is

Quantitative Chemical Analysis, Daniel C. Harris, W. H. Freeman and Co. (1999).

A copy is available in the library, on reserve. The library also has an older circulating copy of it, and any edition will do. This book gives excellent descriptions and examples of almost anything you may have to do in lab involving an instrument. Harris is also the master of data analysis and error calculations.

Schedule of Experiments

Our first experiment will be the one that begins on page 12 of your lab manual. After that, please refer to
www.acad.carleton.edu/curricular/CHEM/courses/rrossi/Chem123_W03/LabSchedule.PDF

Equipment

You will need to obtain several tools for lab work, and bring them with you to each lab period:

- ✓ ANSI Z87.1-complaint safety goggles or safety glasses with side shields. Cheap but uncomfortable ones are available in the bookstore; the chemistry club will be selling nicer, but more expensive, models.
- ✓ **TWO** bound laboratory notebooks. The books must be such that no page can be removed without trace, and must not allow a page to be easily removed by accident. (No spiral-bound notebooks or notebooks with perforated pages.) I recommend the bound composition books sold in the bookstore.
- ✓ The Chem 123 lab manual (with nifty blue cover) [See "Lab Manual" section, above, for details]
- ✓ A calculator capable of determining logarithms, exponentials, and roots

Safety

Safety is of paramount importance in any science laboratory. Laboratory work is inherently more dangerous than your normal daily activities (unless you bungee-jump for a living) and your attitude and behavior in lab should clearly reflect that fact. Realize that if something goes terribly wrong with your experimental work, your classmates are endangered as well as yourself. It's hard to live with having injured someone else.

The following lab safety rules are not negotiable. The TA's and I will vigorously enforce them:

1. You must wear safety goggles, or safety glasses with side shields, whenever the lab is being used.
2. You may not wear footwear that allows any part of your bare foot to be seen (e.g. sandals with no socks)
3. Absolutely, positively, no eating or drinking inside the lab at any time. Wash your hands thoroughly and go completely outside the lab before you put anything in your mouth. ***Please take this seriously.***
4. Wash your hands before leaving the lab room to do something else, or to go home.

I realize items (1) and (2) will mess up some people's wardrobe accessorization plans. Please think of it as a fashion challenge. If you can look good in safety goggles and boring shoes, you can look good anywhere. Look on the bright side, the no-food-in-lab policy may help you with your diet.

I leave it to you to make your own decisions on the following safety issues:

- ❖ You won't find me wearing shorts in lab, even though I want to get to Frisbee as soon as possible after 5:00 p.m. That's because even relatively innocuous chemicals can mess you up if your skin comes into direct contact with them. You have to assume chemicals are everywhere in lab, and I'd much rather get them on my clothes than on my skin. Plus the metal lab stools are really cold if you wear shorts!
- ❖ By similar logic, you won't see me wearing my $300 taffeta evening gown to lab. Three problems with that: one – you *will* get acids and chemicals on your clothes that *will* leave stains and holes; two – thin, synthetic fibers can burn like wildfire, and melt onto your skin, doing you some really serious damage; three – I'm not into the cross-dressing thing. I strongly encourage you to wear clothes made from natural fibers or with a low (<50%) synthetic fiber content, that you would not lament seeing with a few holes or stains. Don't wear your favorite clothes to lab, or anything expensive. If fashion is a must, buy a stylish laboratory coat to wear over your clothes. I know nylon windjackets and pants are all the rage right now, and they do make it easy to get dressed in the morning, but I don't advise you wear them in lab because they are trouble waiting to happen around open flames.
- ❖ As a "professional" chemist, I don't even own contact lenses. They greatly increase the severity of any chemical to eye contact, and should not be worn in lab. The problem is that if a chemical gets in your eye, it will quickly migrate behind your contact lens, where it can not be rinsed out. Getting a contact lens out of the eye of a pain- and panic-stricken colleague is damn near impossible. I know this.
- ❖ If your hair is long, it risks getting dunked into whatever chemicals you are working with. Put it up.
- ❖ Like contact lenses, jewelry is hard to remove in an emergency and makes it more difficult to rinse a chemical off of your skin. The tighter jewelry is, the greater the hazard it poses. Rings are particularly risky. (pain ⇒ swelling ⇒ stuck ring!) Understand the risk you are taking if you wear jewelry into lab.