

Chemistry 129
Honors General Chemistry Laboratory I
Fall Semester 2009

Professor Karin Ruhlandt-Senge

Abhilasha Verma

Course Website: <http://blackboard.syr.edu>

Section 1: Wednesday 12:45 - 3:30 pm

Section 2: Thursday 12:30 - 3:15 pm

Section 3: Wednesday 3:45 - 6:30 pm

(Sign up for one of the three sections)

Laboratory: Room LSB 101 (Life Sciences Building)

Instructors: Abhilasha Verma, CST 4-050
Office Hours: M,F 3:00 – 4:00 pm
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Dr. Ruhlandt-Senge, CST 3-014c
Office Hours: by appointment
Phone: X1306; E-mail: kruhland@syr.edu

Teaching Assistants:

Kari Darling: Office – CST 1-002
Office hours: Thursdays: 3:30-4:30 pm
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Liu (Luke) Muzhi : Office – CST 1-002
Office hours: Tuesdays: 12 – 1 pm
E-mail: muliu@syr.edu

Course Description/Learning Goals: This laboratory course provides students with hands on learning experience for students who expect to major in chemistry or a related discipline (physics, mathematics, etc.) and/or students with strong background and interest in science. The course supplements the lecture (CHE 109) and students will learn both qualitative and quantitative experimental techniques for investigating the properties and reactions of chemical substances.

Lecture: Students in CHE 129 will normally take the lecture course, CHE 109 – Honors General Chemistry, concurrently. *The grade in CHE 129 is completely independent from the lecture course.*

Materials/Textbook: Laboratory Manuals are available at the SU bookstore in the Schine Student Center. The laboratory module booklet must be purchased and brought to the first class. Some experiments will need special handout which will be provided at the beginning of the semester.

General: The first lab will be meeting on September 1/2, 2009 (depending on your session) either at 12:45 (W), 3:45 (W), or 12:30 (Th) in LSB, Room 101.

Preparation for Lab: Your success in this course will depend much on your pre-lab preparation. Reading the modules or handout and thinking through the experiments step-by-step *before* you arrive in lab is imperative. Pre-lab exercises must be turned in *at the beginning* of the laboratory period. The remainder of the laboratory report will be due the following week. Both pre-lab and post-lab assignments are to be turned in individually. This means, you have to *complete and turn in your own individual pre-lab exercise and post-lab report*. If you are not fully prepared for the laboratory (i.e., you do not understand the nature and purpose of the experiment), this will be considered a safety concern and the TA has the authority not to let you work in the experiment. That particular lab will then be count as a zero.

Office Hours: Abhilasha Verma will be available to answer questions and deal with problems or concerns during office hours. TAs will also be available and they may have their own office hours. You are strongly encouraged to obtain any help that you may need.

Email: The instructor and the TAs will only read and answer emails that have a SU email address (*yourname@syr.edu*). All others may be filtered out, due to virus concerns.

Grading: The laboratory reports will count for 80% of the grade. The grade for each report will be determined by both the pre-lab exercise (20%) and post-lab report (80%). A technique score will count for the remaining 20% of the grade. This score will be determined by the TA, based upon his perception of the student's preparedness, cleanliness, punctuality, and attention to lab safety and attitude. All of the work turned in during this semester is done individually. *There will be no make-up labs.*

A deduction of 10% will be made for reports up to one day late, with additional 5% deduction for each subsequent weekday. Both pre-lab and post-lab reports are to be turned in individually. Once an assignment has been turned in to the TA, it cannot be handed back to the student until it has been graded.

Cheating and plagiarism: Students caught cheating will fail the exercise/report (will get 0 point on the specific assignment) and be referred to the appropriate university office for disciplinary action. A letter will be sent explaining the punishment to the Associate Dean of Undergraduate Affairs of the College of Arts and Sciences and to the corresponding Dean of your own College, if you are not an A&S student. If you have further complaints regarding the failed assignment and the letter, you must contact the Associate Dean for Undergraduate Affairs of the College of Arts and Sciences directly.

Each student has to turn in his or her own pre-lab and post-lab report. Copying of the pre-lab and post-lab report instead of turning in your own, in your own words is considered cheating and will be treated as stated above, with 0 points given for the assignment and a letter to the Dean's offices. If two reports are alike in their entirety or in parts, it is considered cheating. Turning in a post-lab and data sheets for a lab you did not complete is also considered cheating.

If you let someone copy your work from you, you will have 50% deduction from your grade and a letter sent to the Associate Dean of Undergraduate Affairs and persons in charge in your college describing these.

Missing a lab: If you miss a lab, regardless of the circumstances, you will be given a zero in the lab. There are absolutely NO EXCEPTIONS. You are NOT allowed to turn in post-lab assignment and data sheet for a lab that you missed.

Lab Works in Groups. While in most cases, labs are done individually, some lab works may require to be done in groups of two students. In such cases, the TA or the instructor lets you know that this will be the case and assigns you to work with someone else in the specific lab session. In such cases, you still have to submit separate lab reports and data sheets, no matter how similar the results may be with your group partner.

Student Athletes: If you are a student athlete and you have to miss a lab due to conflicts with game schedules, etc, you and your coach or athletic advisor have to contact Abhilasha *before* the date where the conflict occurs. You will be allowed to make up for the missed lab in another section during the same week. If you do not make up the lab, you are NOT allowed to turn in post-lab assignment and data sheet for this lab (see section on Cheating and Plagiarism above).

Switching Sections: Once you have been assigned to a section, you are **NOT** at any time allowed to switch sections during the semester, unless we have proof that there is a conflict with another class or an exam, or you need special accommodations. You **and** your instructor have to notify Abhilasha Verma **before** the conflict occurs so that we can make arrangements.

Punctuality: Be sure to arrive on time. Lab sessions will begin with important information concerning the procedures to be followed and safety considerations. If you arrive significantly late and if the TA perceives that time to be very late, he/she may decide not to let you in for that lab session as you will not be able to properly follow the procedures and the safety instructions discussed while doing your lab works. You also need to turn in your pre-lab exercise as soon as you arrive.

Miscellaneous:

- 1) Students with any sort of disability who may need special consideration or accommodation should see Abhilasha Verma immediately. If you contact the Instructor later during the semester, we might not be able to accommodate your special needs.
- 2) No student will be refused in the class because he or she is unable to participate in a class requirement due to his or her religious holiday requirements. However, you must make arrangements with Abhilasha before such absences. According to University policy, "an opportunity to make up examinations and other class work (due to religious observances) will be provided if the instructor is notified **in writing one week before the absence.**"
- 3) Excuses from labs for medical reasons will only be given if such absences are advised by a health care provider or the Health center based on medical findings (i.e., it is not sufficient to just visit the health center) and prescribed treatment recommendations. Verifications need to be made in writing. Such absences will be verified by the Chemistry department staff.

CHE 129 Course Calendar, Fall 2009: (Subject to change)

Date	Experiment	Literature
Sept. 2/3	<i>Check-in and safety review</i> An overview of safety practices, including a discussion of materials safety data sheets, suggestions for case in case of an accident, chemical safety agreement. AND	TECH 380
	<i>Preparation of strontium iodate monohydrate</i> Prepare strontium iodate monohydrate from the reaction of a solution of strontium nitrate and a solution of potassium iodate. Calculate the percentage yield of a compound.	SYNT 347
Sept. 9/10	<i>Weigh out strontium iodate monohydrate, etc.</i> AND	SYNT 347
	<i>Separating the component of a ternary mixture</i> Separate the components of a mixture of sand, sodium chloride and calcium carbonate. Calculate the percentage of each component in the mixture and the percent recovery of the components.	PROP 375
Sept 16/17	<i>Single replacement reactions and relative reactivity</i> Determine the relative reactivity of aluminum, iron, and copper.	REACT 389
Sept. 23/24	<i>Evaluation of vinegar samples</i> The percent acetic acid in a group of commercial vinegar samples is determined by titration. The data are used to evaluate the vinegar samples.	ANAL 304
Sept. 30/1(Oct.)	<i>Evaluation of the gas law constant</i> Determine the volume of a known mass of gas at a measured temperature and pressure. Use these data to evaluate the universal gas law constant, R.	PROP 332
Oct. 7/8	<i>The synthesis of Alum</i> The term alum is a general family name for crystalline substances composed of cations with 1+ and 3+ charges. In this experiment you will synthesize an alum named potassium aluminum sulfate dodecahydrate, $KAl(SO_4)_2 \times 12H_2O$.	Handout
Oct. 14/15	<i>The synthesis of alum part II, crystal growth</i> AND	Handout
	<i>An oxidation reduction titration: The reaction of Fe^{2+} and Ce^{4+}.</i>	Handout

Oct. 21/22	<i>The analysis of alum part III</i> Determine melting temperature of a sample of alum Determine percent sulfate of a sample of alum.	Handout
Oct. 28/29	<i>Estimate the calorie content of nuts</i> The connection between food calories and chemical calories is determined by estimating the calorie content of peanuts, walnuts and other nuts by using a simple calorimeter.	THER 428
Nov 4/5	<i>Determining the mole ratios in a chemical reaction</i> A balanced chemical reaction equation gives the mole ratios of the reactants and products as coefficients. When some of the chemical formulas are not known, an experiment must be conducted to help determine the mole ratios.	Handout
Nov. 11/12	<i>Separation and qualitative analysis of cations</i> Identify cations in a known solution (skip 24-26)	Handout
Nov. 18/19	<i>The enthalpy of neutralization of phosphoric acid</i> Acid-base reactions can be observed and measured thermodynamically. If the temperature of the reaction is measured precisely, the enthalpy of neutralization can be determined. AND	Handout
	Check-out	

Safety in the Chemical laboratory

Safety in the laboratory evolves around knowledge and prevention. Knowledge not only includes an understanding of the nature of the chemical being used and the experiment performed, but it also involves an understanding of how to deal with emergencies. Prevention involves safe practices and above all the use of common sense.

- 1) Familiarize yourself with the hazards associated with the chemicals being used in the experiment. Do not rely on labels alone. Familiarize yourself with the Materials Data Safety Sheets (MSDS). Know how to use common reference manuals. Know the type and extent of hazard associated with the material. Merely being afraid of chemicals does not maximize safety. A folder containing relevant MSDS sheets will be available in the laboratory.
- 2) Learn to recognize the principles of safe operating condition. For example, high pressure cylinders should be clamped or otherwise secured. Open flames should not be used to heat flammable liquids.
- 3) Practice personal safety. Always wear eye protection in the laboratory. Do not wear contact lenses. Eye injuries are extremely serious, but they can be avoided if you keep your goggles on ALL times. Wear adequate shoes, not sandals or slippers. Wear appropriate clothing, no skirts or shorts. Tie long hair back. Lab coats are desirable and are recommended. A place to buy lab coats is in the Medical School Bookstore which is located in the basement of the building on the corner of Harrison and Irving Ave.

4) Common sense prohibits horse-play or practical jokes. Working alone is not permitted. Common sense says that one should not eat, drink or smoke in the laboratory. Common sense does include learning the location of the safety equipment such as fire extinguishers, eye-wash fountains, fire blankets, and emergency showers. Common sense says that one should know how to use these safety items. Common sense says that one should not be afraid or embarrassed to ask how to use these safety items. Common sense also includes the necessity for prior orientation and reading before initiating a laboratory experiment.

5) Do not rush, do not take short cuts. If you rush your work at best you will get poor results. At worst, you will be dangerous to yourself and those around you.

6) One should know some general rules for emergencies. The first thought in all chemical spills and splashes is to inundate the portion of the anatomy involved with lots of water. Acid spills should be neutralized with bicarbonate. If the instructor orders the lab evacuated, leave at once. Find out how you would get medical help, if you need it. Report ALL accidents to your instructor.

7) Do not perform unauthorized experiments.

8) Report any spill immediately to your instructor.

9) Chemical waste is a big problem. Do NOT discard any chemical waste in the sink. Use the appropriately labeled waste containers. If you are not sure, ask your instructor.

10) Keep your laboratory space clean. This also pertains to the balance area and where chemicals are dispensed. You and your fellow students unknowingly can be burned or exposed to toxic chemicals if you do not clean up a spill immediately.

11) Replace caps on containers immediately after use. An open container is an invitation for a spill.

12) Never heat a closed system. Always provide a vent to avoid an explosion.

13) The main potential hazards in the laboratory are fire and exposure to toxic and/or reactive substances. Though toxicity and reactivity of compounds varies tremendously, a good policy is to handle every chemical with respect. Be aware that exposure to chemicals may happen in several ways including inhalation, skin contact, and consumption. Exposure can also occur through cuts from contaminated surfaces. Glass, especially if broken, is to be disposed of with glass waste – never in the trash. Needles and other sharp objects must also be disposed of in special containers. Broken laboratory glass-ware may cause cuts in the skin and be cautious with them.

14) Safety glasses must be worn at all times in the lab. Forbidden items in the lab are: shorts, sandals (or any shoes that do not completely cover your feet), and contact lenses (wear glasses instead).