Principles of Chemistry Laboratory II – Fall 2013

CHM 218 section 103 (CRN 1497) and section 104 (CRN 1498)

Course description: A laboratory course that demonstrates the application of concepts introduced in CHM 212. Credit: 2 hours, Prerequisite or Corequisite: CHM 212

Instructor: Lawrence R. Schmitz, Ph.D.; Science 480; 304-696-2373; schmitz@marshall.edu

Office hours: TR 1:30 – 3:30, W 3:15 – 4:30 or by appointment

Required text: CHM 218 Laboratory Packet (Marshall University Bookstore)

Other required items: chemical splash goggles, bound laboratory notebook, paper towels, lock

Learning Objectives: (1) Learn basic laboratory skills. (2) Understand the connection between the laboratory experience and the principles and concepts studied in the lecture course. (3) Know the rules which must be followed to assure a safe laboratory environment and experience. (4) Know the location of all safety equipment in the laboratory room and be able to operate it if necessary. (5) Understand the concepts of accuracy, precision, significant figures, and experimental error.

Mandatory Safety Training: Before 6:00 pm on Wednesday September 4, complete the Safety Training Course online: go to http://www.marshall.edu/muonline/. Students failing to complete this requirement (which includes submitting the signed form printed using the link provided) will not be permitted to work in the lab.

Safety:

1. Read the laboratory safety rules (pp 3-5) and chemical disposal rules (p 9) in the lab manual. There will be questions concerning this on quizzes and exams.
2. Read and sign one copy of the Chemistry Laboratory Questionnaire and keep a second copy (the one in your manual) for reference. The questionnaire must be signed before check-in is permitted.
3. You are required to comply with all safety rules and all safety-related instructions at all times. Failure to do so is grounds for dismissal from the laboratory.
4. Safety goggles must be worn at all times. Wearing of contact lenses in lab is strongly discouraged. If contact lenses must be worn, a Contact Lens Waiver Form must be signed and given to the instructor.
5. Slacks or dresses cut below the knee are required. Substantial shoes with low heels covering the entire foot must be worn. Avoid very loose clothing or unnecessary items of clothing. Jewelry should be removed.
6. Know the locations of all safety equipment in the lab. You will be tested on this.
7. All injuries, no matter how trivial, must be reported to the instructor immediately. Any accident or near-miss will require a written report discussing how the incident might have been prevented.

Course Performance: Except in highly unusual circumstances, **no make-up of quizzes or experiments are permitted** for unexcused absences. Missed quizzes or experiments are considered "lowest". The lowest quiz and report scores will be dropped so that an unavoidable absence will not jeopardize one's grade. Excused absences (for policy, see link on next page of syllabus) should be arranged in advance if possible.

Answers to pre-lab questions are due at 6:00 pm the day of the experiment. **Do not attach pre-lab questions to reports submitted the same day.** Post-lab write-ups and experimental results (produced using a program such as Microsoft Word) are due at 6:00 pm the period following completion of the experiment. **Late reports are not accepted**. Printing is responsibility of the student. The report format is as follows; follow the guidelines for maintaining a laboratory notebook (manual, pp 10-14).

1. Name, date, course and section numbers, collaborators (if any).
2. Title.
3. Introduction – a short paragraph describing the experiment.
4. Data – raw experimental data presented in the format used in the laboratory manual.
5. Calculations
6. Results and Discussion – graphs and processed data with some meaningful analysis of the results.
7. Questions – use complete sentences and number as in the manual.

Notebooks will be inspected at least twice. Be prepared to submit them at the end of any laboratory period. Quizzes will normally be given at the beginning of the laboratory period. They will normally cover the experiment about to be done but may also cover the experiment being submitted that day.

Computation of final numerical grade: Quizzes 20%, Mid-term Exam 15%, Final Exam 15%, Pre-lab Questions 10%, Post-lab Questions 10%, Write-ups, Experimental Results and Notebook 30%.

Conduct of the Course:

1. Attendance is required. For the policy concerning excused absences and other pertinent University policies (academic dishonesty, inclement weather, disabilities) go to the Academic Affairs website: http://muwww-new.marshall.edu/academic-affairs/policies/
2. Pre-lab presentations are generally brief. Pertinent material from the CHM 211-212 textbook should be read in preparation for an experiment (and possible quiz). Consult MSDS (available online) or other source to learn about any chemical substance being used in an experiment. The lab period will not be extended for those who fail to prepare adequately in advance. This lab has been designed so that lecture and lab topics occur at roughly the same time, emphasizing the interplay between theory and experiment.
3. The bound notebook is for the immediate recording of all experimental operations and any observations made during the laboratory period. Use of pencil and felt-tip pens is forbidden: this is a permanent record written using ink that is not water-soluble.
4. Do not attempt laboratory work if fatigued, hungry, ill, or pregnant.
5. To avoid mishaps, be deliberate. Efficiency and productivity are best achieved without undue haste. Think before acting, and be mindful of classmates.

Schedule of Experiments

Experiment/Assignment	Performed	Report Due
Lab Check-In, Safety Information	Aug 28	
#1-Introduction to Graphing	Aug 28	Sept 4
#3- Synthesis and Characterization of a Triboluminescent Compound	Sept 4	Sept 11
#4- Protein Extraction and Folding: Investigating Intermolecular Forces	Sept 11	Sept 18
#6-Kinetics of Decomposition of Hydrogen Peroxide	Sept 18	Sept 25
#7- Studying LeChâtelier's Principle	Sept 25	Oct 2
#8- Quantitative Analysis: How Accurate Can a Titration Get?	Oct 2	Oct 9
Mid-Term Exam	Oct 9	
#12- Gibbs Free Energy: Solubility and Spontaneity	Oct 16	Oct 23
#10-pH Dependence of Drug Absorption	Oct 23	Oct 30
#11-Qualitative Analysis: What Metal Ions Are in This Solution?	Oct 30, Nov 6	Nov 13
#13-Isolation of Copper Metal from Malachite Beads	Oct 30, Nov 6	Nov 13
#2-Beer's Law: Determining Mass % of Acetylsalicylic Acid in Aspirin	Nov 13	Nov 20
#14-Synthesis of a Coordination Compound	Nov 20	Dec 4
Final Exam; Lab Check-Out	Dec 4	