Principles of Chemistry Laboratory II (CHM 218-205/206): Spring 2007

Credit: 2.00 hours Prerequisite or Corequisite: CHM 212
Instructor: John L. Hubbard, Ph.D.; Science 484; 304-696-3136; hubbard@marshall.edu
Office hours: TR 12-2; W 10-2; or by appointment
Required text: Chem 218 Laboratory Packet (Marshall University Bookstore)
Other required items: chemical splash goggles, bound laboratory notebook, paper towels, lock
Recommended: laboratory coat or apron

Mandatory Safety Training: Before 8:00 am on Thursday January 18, complete the Safety Training Course online: go to http://www.marshall.edu/chemistry/safetyquiz_instructions.asp. Students failing to complete this requirement (which includes submitting the signed form which must be printed) will not be permitted to work in the lab. [Note: This is not required if it was done during fall semester 2006.]

Safety

1. Read the laboratory safety rules (p 3) and chemical disposal rules (p 4) 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 must be worn. Shoes covering the bridge of the foot and the toes must be worn. Avoid very loose clothing or unnecessary items of clothing. Rings 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.
8. Food and beverages are not permitted in the laboratory.

Calculators: Those with alphanumeric and/or graphing capabilities are **not permitted** during quizzes or exams.

Electronic Devices: Cellular telephones and other electronic devices must be turned off during class. **This means from 8:00 am until you have finished work and left the laboratory for the day**.

Course Performance: Except in highly unusual circumstances, **no make-up of quizzes or experiments is permitted**. 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 the online catalog, p 121 at http://www.marshall.edu/ucomm/catalog/interim.htm) must be arranged in advance (if possible).

Computation of final numerical grade: Quizzes (~6-8) 25%, Mid-term Exam 20%, Final Exam 25%, Post-lab Writeups and Experimental Results 20%, Laboratory Notebook 5%, Instructor Evaluation 5%

Answers to pre-lab questions are due at 8:00 am the day of the experiment; evaluation will be part of the report. Post-lab writeups and experimental results (typed except for calculations) are due at 8:00 am the period following completion of the experiment. **Late reports are not accepted**. The report format is as follows, and remember to follow the guidelines for maintaining a laboratory notebook (manual, pp 5-9).

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 (include the question in the answer) 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 occur during the first 10-20 minutes of the laboratory period. No extra time will be allowed if one is late. A quiz may cover any previous experiments as well as the experiment of the day.

Conduct of the Course

1. Attendance is required.
2. Pre-lab presentations (in S-473) are generally brief. Pertinent material from the CHM 211-212 textbook should be read in preparation for an experiment (and possible quiz). 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	Jan 11	
Introduction to Graphing	Jan 11	Jan 18
Beer's Law: Determining the Mass % Acetylsalicylic Acid in Aspirin	Jan 18	Jan 25
Synthesis and Characterization of a Triboluminescent Compound	Jan 25	Feb 1
Protein Extraction and Folding: Investigating Intermolecular Forces	Feb 1	Feb 8
Isolation of DNA from Strawberries	Feb 8	Feb 15
Kinetics of Decomposition of Hydrogen Peroxide	Feb 15	Feb 22
Studying LeChatelier's Principle	Feb 22	Mar 1
Mid-Term Exam	Mar 1	
Quantitative Analysis: How Accurate Can a Titration Get?	Mar 8	Mar 15
pH Dependence of Drug Absorption	Mar 15	Mar 29
Qualitative Analysis: What Metal Ions Are in This Solution?	Mar 29, Apr 5	Apr 12
Isolation of Copper Metal from Malachite Beads	Mar 29, Apr 5	Apr 12
Gibbs Free Energy: Solubility and Spontaneity	Apr 12	Apr 19
Synthesis of a Coordination Compound (handout)	Apr 19	Apr 26
Final Exam; Lab Check-Out	Apr 26	

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.

Disability Accommodations may be granted for certain learning disabilities if the required notice is received via campus mail from either the HELP Center (Myers Hall) or Sandra Clements (PH 117). It is the responsibility of the student to request this notice and to meet with the instructor in advance to make any necessary arrangements.