CHM 157/147 Laboratory
Winter 2010

Instructor: Hari Prasad, Ph.D.
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Office Hours: TWTH 12:00-1:00p.m. or by appointment
T.A.’s: Yu Du and Gary

Course: CHM 157 lab (part of a 5 credit course)
CHM 147
CRN: 10084
Section: 004
Room: 230/240 HHS
Day: Thursday
Time: 1:30-4:30p.m.

Required Items
* Students are required to print the Experimental Data/Observation Sheets and Post-Laboratory/Summary Sections for each experiment. The experiments used in CHM 157/147 laboratory are available to you on the Moodle website associated with this class. (https://moodle.oakland.edu)
* Safety Goggles (not safety glasses). These are available for purchase from the bookstore.

You are responsible for printing your own data sheets weekly and for supplying your own SAFETY GOGGLES. You will need to bring both the printed data sheets and safety goggles with you to every class.

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### Experiment Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Exp. No.</th>
<th>Experiment</th>
<th>Items due</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/7</td>
<td></td>
<td>Introduction, Check-in,&amp; Graphing Exercise</td>
<td></td>
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<tr>
<td>1/14</td>
<td>1</td>
<td>Laboratory Safety</td>
<td>On-line Lab Safety Quiz</td>
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<tr>
<td></td>
<td></td>
<td>Chemical Reactivity Part I &amp; II</td>
<td></td>
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<tr>
<td>1/21</td>
<td>1</td>
<td>Chemical Reactivity Part III</td>
<td></td>
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<tr>
<td>1/28</td>
<td>2</td>
<td>Copper Cycle (Week 1)</td>
<td>Exp #1</td>
</tr>
<tr>
<td>2/4</td>
<td>2</td>
<td>Copper Cycle (Week 2)</td>
<td></td>
</tr>
<tr>
<td>2/11</td>
<td>3</td>
<td>Conductivity of Solutions</td>
<td>Exp #2</td>
</tr>
<tr>
<td>2/18</td>
<td>4</td>
<td>Acid/Base Titrations</td>
<td>Exp #3</td>
</tr>
<tr>
<td>3/4</td>
<td>5</td>
<td>How Much is Too Much (Week 1)</td>
<td>Exp #4</td>
</tr>
<tr>
<td>3/11</td>
<td>5</td>
<td>How Much is Too Much (Week 2)</td>
<td></td>
</tr>
<tr>
<td>3/18</td>
<td>6</td>
<td>Analysis of Copper in Brass (Week 1)</td>
<td>Exp #5</td>
</tr>
<tr>
<td>3/25</td>
<td>6</td>
<td>Analysis of Copper in Brass (Week 2)</td>
<td></td>
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<tr>
<td>*4/1</td>
<td>7</td>
<td>Molecular Structure (room 230)</td>
<td>Exp #6</td>
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<tr>
<td></td>
<td>8</td>
<td>Synthesis of Aspirin (room 240)</td>
<td></td>
</tr>
<tr>
<td>*4/8</td>
<td>7</td>
<td>Molecular Structure (room 240)</td>
<td>Exp #7 or #8</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Synthesis of Aspirin (room 230)</td>
<td></td>
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<tr>
<td>4/15</td>
<td></td>
<td>Check-out</td>
<td>Exp #7 or #8</td>
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</tbody>
</table>

Last day for Official Withdrawal is March 16, 2010. If you drop this course, please come in and check out of the lab drawer. You will be charged a check-out fee ($10.00) if you don't check out of your drawer. The last day to check-out of your drawer is Friday April 16, 2010.
* If the lab is split into 2 rooms, then students in 230 HHS will do Expt. 7 and the students in room 240 HHS will do Expt. 8 the first week. The following week the rooms will switch assignments. For Experiments 7 & 8, students will submit one lab report per group.

**Course Philosophy:**

Chemistry is an experimental based science. What we know today is because thousands of scientists have made millions of experimental observations over the past several hundred years. From these observations, fundamental principles have been deduced regarding properties and reactivity of matter. Chemistry 157/147 is designed to acquaint you with some of the approaches used by chemists to investigate chemical phenomenon (sometimes referred as the "Scientific Method"). Along the way you will learn several laboratory techniques and become familiar with the properties of a variety of chemicals.

**Catalog description:**

Integrated lecture-laboratory. States of matter, atomic structure, bonding and molecular structure, chemical reactions. Recommended preparation is three years of high school mathematics and one year of high school chemistry. CHM 157 satisfies the university general education requirement in the natural science and technology knowledge exploration area.

Prerequisite: Score of 20 or higher on ACT mathematics exam; or MTH 012; or CHM 104.

**Purpose:**

The laboratory combined with the lecture is designed to reiterate the chemistry concepts learned in the classroom through hands-on experience. The laboratory portion of this class will familiarize one with basic laboratory techniques. In many instances the experiments demonstrate how these basic chemistry concepts relate to everyday life.

**Absence Policy:**

There is a no make-up lab policy for CHM 157 laboratory. Students who are absent or planning on missing a lab should notify their lab instructor immediately. Special considerations will only be granted for students who have experienced extreme circumstances and notified the instructor within 12 hours of the missed lab. The instructor is the sole judge of the circumstances that qualify as a condition sufficient for special consideration. Point deduction for a missed lab will be based on the circumstances and determined by the lab instructor. At a minimum, students will lose all participation and data points for that experiment. If the instructor is not notified within 12 hours of a missed lab, then the student will receive a zero grade for that experiment. Failure to attend labs places an extra burden on a student’s laboratory partner. **Students that miss more than two lab periods will be given a score of 0% for the laboratory portion of CHM 157.**

**Laboratory Reports & Grading:**

**Late Reports:** Although you will be working with a partner, **each student will submit their own lab report. Lab reports are due at the beginning of the lab period that follows the completion of an experiment. (See schedule for lab due dates)** Late lab reports lose credit as follows: 1 day late = -10% of possible total points; each additional day late = -10% of possible points per day. (Note: 5 minutes late and 24 hours late both count as “1 day late”.) Lab reports are due on the due dates indicated on the schedule even if you are absent the day the lab report is due. The report will be considered late if you fail to submit your lab report on its due date. The above guidelines for late lab reports will be followed.

**Report Grades:** Lab report grades will be posted throughout the semester on the Moodle website. Students will be allowed to look at their graded reports in the laboratory, but they will not be allowed to take them from the laboratory. If the graded lab report is not returned to the instructor, they will receive a zero score for that lab.
**Grade Calculation:** Final grades earned in the lab will be based on the total points earned by the student (Safety Quiz + Lab reports = 815 pts). Each student will submit 8 lab reports (100 pt each). The final percentage for the lab will be forwarded to the lecture instructor and be worth 20% of the overall CHM 157 grade. **No lab report scores will be dropped, and no extra credit will be given.**

**Safety Requirements**

All students are expected to abide by the safety requirements set forth by Oakland University. The code of safe conduct is in the Oakland University Undergraduate Chemical Laboratory Safety Manual. This document can be found on the Moodle website for this course ([https://moodle.oakland.edu/](https://moodle.oakland.edu/)). Each student is expected to read and understand the manual. Prior to starting the first experiment, each student must complete and pass the safety quiz which is also found on the Moodle website for this course. Students that do not pass the safety quiz will not be allowed to participate in the lab. Any student not following the code of safe conduct will be removed from the lab and receive a zero grade in the lab.

**Laboratory Waiver**

Any student that has completed CHM 157 at Oakland University within the last three years and has a grade of 75% or better in the lab is eligible for a laboratory waiver. If you wish to apply for a laboratory waiver, a General Chemistry Laboratory Waiver Form must be filled out and submitted to your current lecture instructor within the first week of the current semester. This form can be obtained from your lecture instructor and is located in the Department of Chemistry office (260 SEB). If your application for the laboratory waiver is approved, the laboratory grade earned in the previous semester will be used when calculating your final CHM 157 lecture grade. You must attend the lab until the laboratory waiver has been approved. You must remain registered for the lab if the waiver is approved.

**Add/Drops**

It is the responsibility of the student to know the deadlines set forth by the University for add/drops. Any student that drops the lab is still required to check-out of the lab. Any student that does not check-out of the lab will be charged a $10 check-out fee.

**Special Considerations**

Students with disabilities who may require special considerations should make an appointment with campus Disability Support Services. Students should also bring their needs to the attention of the instructor as soon as possible.

**Closing of the University:**

In the event that the University closes on a day when class is held forcing the class to be cancelled, the scheduled events for the cancelled class day will be conducted on the next meeting.

**Academic Conduct:**

Students are expected to uphold the academic standards set by Oakland University. The work submitted by any student should be their own work. Students suspected of academic misconduct (Examples of academic misconduct are the submission of labs containing data that has been falsified, copying any part of your lab from a previously graded lab report, copying from other students, plagiarism, changing answers on your lab report after the report has been graded, the use of materials not authorized by the instructor, obtaining copies of old lab reports or answer keys, or another student completing the lab for you), will be reported to the academic conduct committee. Students found guilty of academic misconduct for the laboratory will receive a zero grade for the course. Note: this is not just for the laboratory portion of the course, but the 0.0 grade is for the entire 5 credit hours of CHM 157. For further details see Academic Conduct Policies section (p. 77 – 80) in the 2009 – 2010 Undergraduate Catalog ([http://www2.oakland.edu/catalog/undergrad](http://www2.oakland.edu/catalog/undergrad)).
Laboratory Expectations:

Before Lab:

1. Read the experiment. This will familiarize you with the experiment, as well as allow you take the time needed to think about what you will do at each stage of the experiment.

2. Pre-lab assignment: This is due at the beginning of the lab period before the lab starts. If you have not covered the material in lecture, you are still responsible for completing ALL of the pre-lab problems before class. The Pre-lab assignments are usually located between the procedure section and the data sheets in the experiment. The Pre-lab assignment pages should be printed and your answers legibly hand-written directly on those pages. The pre-lab assignment should be submitted to the instructor upon entering the lab. You will not be allowed to work in the lab unless your pre-lab has been completed. An incomplete pre-lab assignment will lose 50% of the total pre-lab points possible.

3. Procedure: The Experimental Procedure needs to be hand-written on 8.5” x 11” paper. No photocopies or printouts of the original document will be accepted. The procedure should be prepared in an outline format (cookbook). Make sure to include safety precautions and any special handling techniques and diagrams within the outline. The procedure is also due at the beginning of the lab period. Please have the procedure out on the bench at the beginning of class to be initialed by your instructor or TA.

   You will not be allowed to work in the lab unless your Pre-lab and procedure are complete. If your Pre-lab assignment or procedure is not complete when you enter the lab, you will be asked to leave the lab to finish this assignment in the hallway. You are then only eligible for 50% of the pre-lab and/or procedure assignment points for that lab. No additional lab time will be given to those that do not come prepared to lab.

4. Additional Reading: Read any sections in the “Laboratory Skills” document that may pertain to the days experiment. This document is available on Moodle. (https://Moodle.oakland.edu)

5. Data Sheets: Print a copy of the data sheets for the days experiment. You will need these for class. If you do not have the data sheets with you, you will be required to go print out these pages before you can begin the lab. This will require you to walk to the nearest campus computer lab.

6. If the objective of the lab or the background material is not clear, seek assistance before the lab. Possible sources of assistance include your classmates, the instructor, or the teaching assistant.

During Lab:

1. At the beginning of each lab, your instructor or teaching assistant will give a brief pre-lab lecture/discussion. This lecture will include pertinent information regarding laboratory techniques or that may be necessary for you to complete the lab safely. During this time you will also have an opportunity you to ask questions. You should listen carefully to any comments that are made regarding current and future labs. Note, you will not be told what to do or what the experimental results should be; part of your job is to figure out these details.

2. You are expected to be on time for lab. Students who are late to lab will not be given additional time to complete the lab. Students that are excessively tardy will lose participation points.

3. You should conduct yourself in a manner that would provide a safe working environment in the lab for all students. Students acting in such a manner that would jeopardize the safety of any student will be asked to leave the lab and will receive a zero for the day’s work.
4. You should work efficiently with your lab partner. All labs are designed to be completed within the 3 hour lab period. No additional lab time will be given. This sometimes requires that the work be divided between you and your lab partner.

5. At the end of the day, all data MUST be initialed by the instructor or TA. Data sheets without initials will be given a zero. It is your responsibility to make sure your data sheets are initialed before leaving the lab.

6. Additional Lab notes:
   a. All data must be recorded in ink directly onto data sheets. No pencils or erasable ink pens allowed, as well as recording data on a separate sheet of paper is prohibited. Data sheets containing data recorded in pencil will NOT be initialed.
   b. Always use the proper number of significant figures.
   c. Always include units in any measurement.
   d. If you make a data entry/recording error, the following procedure for correcting that error is as follows.
      1. Any errors made in the lab should be crossed out with a single line and then the corrected data written next to the error where there is space. DO NOT SCRIBBLE OUT ERRORS!
         e.g. 0.0476 g 0.476 g
      2. Any data recording errors must be initialed by the instructor or TA before you leave the lab. Lab report data sheets submitted with errors not initialed by the instructor will lose data points.
   e. Reminder: Decimal numbers should include a zero in front of the decimal.

7. Additional Safety notes:
   a. No food or drink allowed in the lab.
   b. No shorts or open toe shoes.
   c. If you feel ill, sit down and tell the closest person to you that you are not well and need assistance. Do not try to leave the room unless you are accompanied by someone. This is for your own safety in the lab.
   d. The use of cell phones or any electronic device that may distract you and compromise your safety or the safety of the other students is prohibited.
   e. Surfing the internet for anything not pertaining to lab work is strictly prohibited.

Lab Reports:

1. Lab reports are due at the beginning of the lab period that follows the completion of an experiment. Turn in completed lab report to your lab instructor or designated area.

2. Lab reports should include the following in order as listed on the grading sheet:
   - Grading-sheet (ON TOP) with your name and partner’s name, procedure, data and observations, any graphs or tables, and post-lab questions

3. Pages should be in numerical order or in the order of how it is listed on the grading sheet. Grading sheet should be on top.

4. The lab report must be stapled prior to coming to lab. If your lab report is not stapled prior to coming to lab, you will have five points deducted from your lab report score.

5. Your name should appear on all pages.
   Due to the large number of lab reports that are turned in, occasionally pages come loose during the process of submission and grading.