Physical Chemistry I (Laboratory) (CHEM-3243.21)
Fall 2003

Instructor: Dr. Arthur R. Murphy Office: DH 4456
Office Hours: M W F 11:00 AM to Noon and by appointment
Phone: (201)-692-2322
Day: Wednesday
Time: 5:25 PM – 8:50 PM
Rooms: Computer Lab 2nd floor Dickinson Hall,
Physical Chemistry Lab (fifth floor DH)
Some experiments in Physics Lab.Becton Hall (Teaneck) and computer
c lab (Room TBA)

Catalog Description: Physical Chemistry Laboratory I
Laboratory experiments demonstrating fundamental laws, concepts and mathematically derived relationships involving selected physico-chemical properties of matter and energy. Corequisite: CHEM 3241.

Introduction:
The Physical Chemistry I Laboratory experiments are chosen so as to reinforced, augment, and amplify the material that is discussed in the Physical Chemistry I lecture course. Experiments involving gases, thermodynamics, and transport processes will be explored.

Expectations:
1) Late Lab reports will not be accepted. Usually, lab reports are usually due two weeks after an experiment is concluded. Exceptions to this rule will be stated in due course.
2) All safety procedures must be followed exactly. Details regarding safety will be discussed during the first lab period. Note that no student will be permitted into laboratories wearing shorts, halter-tops, open toed sandals, undershirts, tank tops or any other inappropriate attire. All students must purchase a white laboratory coat which can be used for any Biology or Chemistry class which requires a lab. This rule applies to non-majors or majors.
3) In addition to performing the experiments, students will be expected to become proficient in the use of scientific software packages such as Mathcad and/or MatLab.

TENTATIVE LABORATORY SCHEDULE

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<tr>
<th>Week</th>
<th>Date</th>
<th>Activity</th>
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<tbody>
<tr>
<td>1</td>
<td>9/5/01</td>
<td>Safety Discussion. Laboratory Report Format.</td>
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<td>Introduction to Mathcad.</td>
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<td>2</td>
<td>9/12/01</td>
<td>Mathcad Projects (Non-ideal gases)</td>
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<td>Perhaps Introduction to MatLab + MatLab Projects</td>
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(Intermolecular forces + Kinetic Theory)

3  9/19/01  Kinetic Theory Simulator
4  9/26/01  Kinetic Theory Simulator (continued)
5  10/3/01  \(C_p/C_v\) by resonance cavity method.
6  10/10/01  Experiments will be chosen from
               i) Microscale Vapor Pressure measurements or perhaps
                  vapor pressure measurements via spectroscopy
               ii) Heat of Neutralization
               iii) Heat of Solutions.
7  10/17/01  \(pK_a\) of an indicator
8  10/24/01  Surface Tension Measurement using 2 or more techniques
9  10/31/01  Viscosity Measurements
10 11/7/01  Partial Molar Volumes
11 11/14/01  Colligative Property or a Thermodynamic Experiment.
12 11/28/01  Phase Rule Experiment
13 12/5/01   TBA
14 12/12/01  Check out

**Grading Policy: Lab Reports: \%100**

The exact lab report format to be followed will be discussed during the first lab period. Lab reports will be graded on the basis of neatness, thoroughness, adherence to the required lab report format, and experimental accuracy and precision. A thorough discussion of errors must accompany each lab report.

**Outcomes assessment:**

Students who have successfully completed this course should have reinforced their knowledge of the material covered in the Physical Chemistry I (Lecture Course). Specifically, students should have an understanding of ideal, real gases, and the kinetic theory of gases as well as an understanding of various aspects of applied thermodynamics and some transport properties.