

Brandeis University
Summer School 2008
CHEM 18A General Chemistry I Laboratory

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Lab Schedule 1:00-5:30 M, Th; Kalman 210

Text: General Chemistry Laboratory Manual, Milos Dolnik. The text is available only at the chemistry stockroom (\$10).

Lab Notebook: The lab notebook may be purchased from the bookstore (\$18) or the chemistry stockroom (\$12).

Grading: Your lab grade will consist of your lab report average (90%) and a class participation/laboratory performance grade (10%) to be determined by the teaching assistant. Lab reports are due the next laboratory period. A penalty of 5% per day will be assessed for tardy lab reports.

Lab Notebook

Each student should keep his or her own lab notes during an investigation. All lab notes must be in ink. Press firmly when writing in lab notebook as you are making two copies. The yellow copy should be submitted for assessment; the white copy should remain bound in your lab notebook at all times. All labs must be written in your lab notebook unless otherwise stated by your teacher.

In Preparation for Lab Day

Before you arrive to class on lab day you are required to have read the laboratory experiment. While there will be short pre-lab lectures before each lab, only the important points of the experiments will be presented. It is your responsibility to have prepared for the labs in advance by studying the concepts and the procedures. You must also submit answers to pre-lab questions at the beginning of the laboratory session to your TA. The answers to the pre-lab questions should be written in your lab notebook. This little bit of preparation insures that you are familiar with the experiment before coming to class. Failure to do so may prevent you from performing the experiment with the class. In addition to the answers to the pre-lab questions, you must also write the Title of the Experiment, the Date, the Purpose, and the Procedure in your lab notebook before you come into lab.

Performance in the Laboratory

As a student scientist engaged in meaningful research, your laboratory experience should probe to be challenging and exciting! Because you are part of a collaborative effort, you should be an active participant at all times. In order to ensure the safety of yourself and your classmates, you should constantly be aware of your surroundings-our lab stations are very close together. The lab equipment should be treated with respect and should be used for its intended purpose only. Finally, you are expected to clean up your lab station

when your experiment is finished-failure to do so will result in a penalty. Most importantly, you should be on task at all times, regularly making meaningful contributions to your group's work.

The End of the Lab

At the end of each lab period, you should submit a copy of any portion of the lab that you have completed so far. If time permits, you should complete the necessary calculations to the lab you have just completed. This may allow you to repeat any portion of the laboratory experiment should you find that your data is not accurate.

The Lab Report

As stated earlier, the lab report will be due the next lab period. Now that the data tables and observations have been recorded, calculations must be completed and any post lab questions should now be answered. The last section is a discussion/conclusion section (see last page for details). The general format and hints on how to write a good lab report are located on the last page of this document.

Academic Integrity Policy

You can find the appropriate sections on academic integrity in the Brandeis University The section of the student handbook that addresses academic integrity can be found here: http://www.brandeis.edu/studentlife/sdc/rr/html/rr_section4.html. Scientist do not work in isolation -it is expected that you will work collaboratively during the data collection phase of an investigation if necessary. And while it is appropriated to consult your peers when interpreting data, the lab report you produce must be your own work. Using someone else's words or ideas (whether a classmate or textbook author) without giving credit is considered plagiarism.

The relevant paragraphs of section four are shown below:

4. Maintenance of Academic Integrity

- 4.0** Every member of the University community is expected to maintain the highest standards of academic integrity. A student shall not submit work that is falsified or is not the result of the student's own effort. Infringement of academic honesty by a student subjects that student to serious penalties, which may include failure on the assignment, failure in the course, suspension from the University or other sanctions (see Section 21). A student who is in doubt regarding standards of academic honesty in a course or assignment should consult the faculty member responsible for that course or assignment before submitting the work. A student's lack of understanding is not a valid defense to a charge of academic dishonesty.
- 4.1** A student's name on any written exercise (e.g., examination, report, thesis, theme, notebook, laboratory report, computer program, etc.), or in association with an oral

presentation constitutes a representation that the work is the result of that student's own thought and study. Such work shall be stated in the student's own words, and produced without the assistance of others, except for quotation marks, references, and footnotes that accurately acknowledge the use of other sources (including sources found on the Internet). Talking during an examination, or possession or use of unauthorized materials or equipment during an examination constitutes an infringement of academic honesty. Attempting to receive credit for work not originally submitted also constitutes an infringement of academic honesty.

4.2 In some instances, a student may be authorized by a faculty member to work jointly with (an)other student(s) in solving problems or completing projects. However, students may not collaborate on assignments without explicit permission from the instructor. To provide, either knowingly or through negligence, one's own work to assist another student in satisfying a course requirement constitutes an infringement of academic honesty. Aid from personnel associated with University-sanctioned tutoring services is acceptable; tutor-assisted work submitted for a grade should be done with approval of the instructor.

4.3 Unless permission is received in advance from the faculty member in charge of the course involved, a student may not submit, in identical or similar form, work for one course that has been used to fulfill any academic requirement in another course at Brandeis or any other institution. A student who perceives the possibility of overlapping assignments in courses should consult with the appropriate faculty members before presuming that a single effort will fulfill requirements of both courses.

Disability Statement

If you are a student with a documented disability, please see the Summer School Office staff immediately so that all appropriate accommodations can be made. No accommodations will be made retroactively. You should contact me immediately if you have any special need(s) requiring accommodations in the event that classroom/buildings must be evacuated.

Tentative Schedule of Experiments

Date	Experiment	Reading	Pre-lab Questions
July 7	1. Orientation and Laboratory Safety 2. Measurements and errors: Sugar in beverages	pp. 1-22 pp. 23-30	1-3
July 10	Periodic Table and Trends	pp. 31-36	1-3
July 14	Stoichiometry: Synthesis of oxalate complexes	pp. 37-44	1-3
July 17	Oxidation-reduction titration: Analysis of oxalate complexes	pp. 45-52	1-4
July 21	Thermochemistry: Heat of formation of MgO	pp. 53-58	1-2
July 24	States of matter: Boiling point and density of an unknown liquid	pp. 59-64	1-2
July 28	Gases: Boyles Law, vapor pressure, evaporation, and IR spectra	pp. 65-80	1-2, 1-2
July 31	Solutions: Electrical conductivity, freezing point depression	pp. 81-86	1-3
Aug 4	Chem. 18: Atomic absorption spectroscopy: Iron tablet	pp. 87-90	1-3
Aug 7	Check Out and Final Lab Report Due		

Laboratory Report Format

Informal lab reports are written in your lab notebooks.

Header information: Write your name, the date, experiment title, and your class block.

Purpose Section: Write a sentence or two, which explain the purpose of the experiment.

Planning Section: List necessary materials and equipment. Write a procedure including step-by-step directions in a list format.

Safety: List any safety precautions.

Data Section: Data should be well organized and tabulated when possible. All measurements must have units. Neatness counts. All measurements taken should be in the table. Do not hide faulty data but present it. Later, in your conclusion, you may explain why you have decided not to use the suspected error in your analysis. Manipulated data should be distinguished from raw data.

Observations: Describe the reaction before, during, and after. Note the color, clarity, and state of matter. Note any evidence of chemical change. If a mistake occurred during the carrying out of the procedure be sure to record it in this section.

Calculations: Show work on how you converted data into results. Show all calculations, or sample calculations if repeated. Used proper units and consider significant figures. Be sure to LABEL all values clearly and remember your significant figures.

Post-lab Questions: If questions are provided, then answer them in complete sentence(s) that restate the question in the answer.

Discussion/Conclusion: Summarize the results of the experiment. This should relate back to the purpose. Report any data that you suspect contains errors and explain. Does the data make sense? Report any difficulties you had but do not include accidents that you were able to correct. Include an error analysis if you instructor assigns one. If an error analysis is assigned you should list ONE possible reason why your experiment may not have resulted in the correct answer or the accepted results. Do not include such errors as “I did my calculations wrong”, “I read the balance wrong”, “The chemicals could have been contaminated” or the instruments we used are not very accurate.” Each error should be followed with an explanation of how your results will be affected either in paragraph or tabular form. An example of an error analysis in tabular form is listed below:

Error Source	Effect of error on data explained	Effect on results explained	Relevant, realistic improvement
Substance was dried for 1 hour.	Substance was wet, measured mass was high.	<ul style="list-style-type: none">• High mass, percent yield over 100%•	Dry substance overnight in oven