



Course Objectives and Description

CHM 1046L is the second half of the CHM 1045L 1046L laboratory sequence for science, premedical science, and many engineering majors. This lab course's objectives are to introduce students to experiments that reinforce and illustrate lecture topics and common general laboratory techniques. The experiments performed will cover the following topics: quantitative and qualitative analysis, colligative properties, thermochemistry, and equilibria. Pre-requisite: A grade of "C" or better in CHM 1045 and CHM 1045L. Co-requisite: CHM 1046L
The detailed course competencies are online, on the college's webpage.

Grading Policy, Required Materials, and Laboratory Schedule

Each semester's laboratory schedule, required materials, and grading policy are provided on a separate sheet.

Weekly Reports

The following are general guidelines that will be used for grading your lab reports. **The numerical grade on each lab report is based on:**

- *the correctness, completeness, and neatness of your report and exercises.* At the end of every experiment in the lab manual there is a corresponding report form as well as related exercises. This form must be filled out in ink along with the exercises worked out. Any required graphs must be properly done and submitted with your report.
- *the inclusion of calculations/setups.* These calculations must be appropriately labeled, and completely and clearly support your reported results.
- *the significant figures you provide in the report and how they correctly represent the data you obtained.*
- *the accuracy of your experimental work.* See separate schedule for specific grading details.
- *the timely submittal of your report.* Written lab reports are to be turned in at the beginning of the lab period following completion of the experiment. Some labs require more than one week to complete. Some of the labs are timed experiments and must be turned in at the end of the same period in which they are done. The Hexacation analysis is a timed experiment. You may not work on your lab report for the preceding week during lab time. *One point will be deducted for every day your report is late. Lab reports that are more than one week late will earn a grade of zero and will not be accepted.*

Scientific Notebook

Detailed instructions on how to keep a scientific notebook are given in Appendix I of your lab manual. Your notebook will be examined at the beginning of every lab session and signed by your instructor. Your notebook is a working document that supports the results you report. Without it, your results are considered null and void. Notebooks are routinely the subjects of scrutiny in public as well as private scientific institutions. Faithfully maintaining an accurate scientific notebook is a core objective of the general chemistry laboratory curriculum.

Failure to follow your instructor's specific directions will result in a lower notebook grade.

Instructor Performance Evaluation

The instructor's evaluation will be based on your adherence to rules and your willingness to follow your instructor's instructions. This is especially important when discussing safety issues. Failure to follow safety instructions may result in your expulsion from lab and/or a five-point deduction per infraction.

You are expected to:

- adhere to and follow the *General Safety Rules* on pages vii-x in your lab manual. One of these rules is that *you wear safety glasses at all times*. For safety reasons, students who fail to follow safety rules may be expelled from lab.

- come to every recitation and lab session, arrive on time, stay until dismissed, and conduct yourself with respect for the laboratory environment.
- prepare for each lab by reading it thoroughly and preparing your notebook before coming to lab. Students without a prepared notebook are not considered ready for lab and may not be allowed to work during the assigned period.
- clean and return all glassware/equipment to its proper place and leave your work area clean. The instructor may assign students to clean-up duty.

Tests

There will be three exams given in this course, all during the recitation session. The coverage of these exams is given on the separate lab schedule. Fifty percent of the test will come from experimental calculations/exercises and the other 50% will come from study sheet problems.

*Students who miss exams 1 or 2 will be given one opportunity to make up that **one** exam on the date and time specified on the separate lab schedule. There is no makeup for exam 3. Any other arrangements are at the discretion of your instructor. An **unexcused absence from an examination can result in an instructor evaluation deduction of up to fifteen points.***

No programmable calculators, or electronic devices may be used during an exam. Only non-programmable calculators are allowed.

Makeup Labs and Repeats

There is no "makeup week"! If you are absent from a lab session, you must arrange to attend another lab session during the **same week**. Your instructor must give you written permission and the other lab instructor will consider your request to attend their lab. Out of courtesy, plan to arrive and leave the makeup lab on time and contact the makeup instructor ahead of time. If the makeup instructor's lab is full and there is no reasonable space for you, then you will not be allowed to work during that session. *Other missed labs will earn a grade of zero unless other arrangements can be made at your instructor's discretion.*

If you wish to repeat the Soda Ash or the Freezing Point, you may do so but for 80% credit only. *The repeat grade counts even if it is lower than the original grade.*

Academic Dishonesty

Students caught cheating will be given a zero on the assessment or report. Further action will follow the steps outlined in the Students' Rights and Responsibilities.

Lockers and Breakages

You will be checking in to your own personal drawer at the beginning of the semester. Verify that all the glassware is there and not broken. *Failure to check out at the end of the semester will result in a \$15.00 check out fee and a fifteen-point deduction from the instructor evaluation.*

Additional Help

Your instructor's office hours are posted on their cubicle doors in room 3291. Free peer tutoring is available in room 3326.

Drops and Incompletes

If you plan to drop CHM 1046L and receive a grade of "W", you must consult your lab instructor, fill out a drop card, and turn it into the Registrar by the drop date. Before the mid-semester mark, you must drop both, the lecture and the lab together. Before the mid-semester mark, you will not be allowed to stay in the lab and drop the lecture. After the mid-semester mark, it is up to your lab instructor to grant permission to stay in the lab. There are no grades of Incomplete given in this course.

CHM1046L Laboratory Schedule (Fall 2015-1)

| M | T | W | R | F | S |
|----------------|---------------|--------------------|--------------------|--------------------|--------------------|
| 24 Intro | 25 Intro | 26 Intro | 27 Intro | 28 Intro | 29 Intro/14 |
| 31 Ex. 14 | 1 Ex. 14 | 2 Ex. 14 | 3 Ex. 14 | 4 Ex. 14 | 5 Labor Day |
| 7 Labor Day | 8 Ex. 14 | 9 Ex. 14 | 10 Ex. 14 | 11 Ex. 14 | 12 Ex. 14 |
| 14 Ex. 14 | 15 Ex. 11 | 16 Ex. 11 | 17 Ex. 11 | 18 Ex. 11 | 19 Ex. 11 |
| 21 Ex. 11 | 22 Ex. 3 | 23 Ex. 3 | 24 Ex. 3 | 25 Ex. 3 | 26 Ex. 3 |
| 28 Ex. 3 | 29 Ex. 16 | 30 Ex. 16 | 1 Ex. 16 | 2 Ex. 16 | 3 Ex. 16 |
| 5 Ex. 16 | 6 Ex. 16 | 7 Ex. 16 | 8 Ex. 16 | 9 Ex. 16 | 10 Ex. 16 |
| 12 Ex. 16 | 13 Ex. 16 | 14 Ex. 16 | 15 Ex. 16 | 16 Ex. 16 | 17 Ex. 16 |
| 19 Ex. 16 | 20 Ex. 16 | 21 Ex. 16 | 22 Ex. 16 | 23 Ex. 16 | 24 Ex. 16 |
| 26 Ex. 16 | 27 Ex. 16 | 28 Ex. 16 | 29 Ex. 16 | 30 Ex. 16 | 31 Ex. 16 |
| 2 Ex. 16 | 3 Ex. 17 | 4 Ex. 17 | 5 Ex. 17 | 6 Ex. 17 | 7 Ex. 17 |
| 9 Ex. 17 | 10 HPLC | 11 Veterans Day | 12 HPLC | 13 HPLC | 14 HPLC |
| 16 HPLC | 17 Ex. 19 | 18 HPLC | 19 Ex. 19 | 20 Ex. 19 | 21 Ex. 19 |
| 23 Ex. 19 | 24 Ex. 20 | 25 Ex. 19 | 26 Thanksgiving | 27 Thanksgiving | 28 Thanksgiving |
| 30 Ex. 20 | 1 Checkout | 2 Ex. 20 | 3 Ex. 20 | 4 Ex. 20 | 5 Ex. 20 |
| 7 Checkout | 8 No Lab | 9 Checkout | 10 Checkout | 11 Checkout | 12 Checkout |

Key to Laboratory Objectives

| Intro | Introduction / Lab Safety / Check In | Exp. | Ntbk. |
|--------|---|------|-------|
| Ex. 14 | Analysis of Soda Ash | 50 | 5 |
| Ex. 11 | Freezing Point Lowering | 25 | 5 |
| Ex. 3 | Thermodynamics | 25 | 5 |
| Ex. 16 | Cation Analysis (Also Read Appendix IV) | 96 | 10 |
| Ex. 17 | Hexacation Analysis | 40 | - |
| Ex. 00 | HPLC Analysis will be sent via email | 30 | 5 |
| Ex. 19 | Chemical Equilibrium | 25 | 5 |
| Ex. 20 | Equilibrium Constant of a Weak Acid | 25 | 5 |

| Test | In Recitation | Experiment | Study Sheet | Points |
|------|---------------|----------------|-------------|----------------|
| #1 | September 29 | 11 and 14 | Coverage | 13, 14, 15, 16 |
| #2 | November 3 | 3 and 16 | Coverage | 21, 22, 23, 24 |
| #3 | December 7 | 17, 19, 20; 00 | Coverage | 25, 26, 27, 28 |

Makeup Test Schedule:

December 5th (Saturday)
1:00-2:10 PM – Room 2114

Drop Date
Nov 3rd (Tue)

Required Laboratory Text and Materials:

- *Laboratory Experiments in General Chemistry by Anthony J. Pappas and Larry E. Bray*
- *Safety Goggles (Glasses), Composition Notebook, and*
- *Scientific Calculator (non-programming/non-graphing only)*

Final Grades

Students can view their grades from the following MDC web site:
http://www.mdc.edu/college_wide/

CHM1046L Grading Policy:

Your grade will be determined by your performance on submitted lab reports, how well you keep your lab notebook, and an instructor evaluation. These categories will be broken down as follows:

| | |
|---|-------------------|
| Laboratory Experiments | 316 points |
| Lab Notebook | 40 points |
| Laboratory Tests (3 tests at 100 points each) | 300 points |
| Instructor Performance Evaluation | 50 points |
| Total Number of Points | 706 points |

Grading of Reports:

- **Analysis Soda Ash:**

Your results will be graded on the basis of parts per thousand (ppt) deviations from the correct value. The first 10 ppt error are free; thereafter each 3 ppt error results in a one point deduction, up to a maximum of 40 points. The grading on remaining 10 points will be based on the correctness, neatness, and completeness of the report.

- **Freezing Point Lowering:**

Your results will be graded on the basis of % deviation from the correct value. The first 10% deviation are free, thereafter each 4% error results in a one point deduction, up to a maximum of 10 points. The grading on the remaining 15 points will be based on the correctness, neatness, and completeness of the report.

- **Thermodynamics: Heat of Neutralization/Calorimetry:**

Your results will be graded on the basis of % deviation from the correct value. The first 10% deviation are free, thereafter each 3% error results in a 0.5 point deduction, up to a maximum of 10 points. The grading on the remaining 15 points will be based on the correctness, neatness, and completeness of the report.

- **Cation Analysis:**

Six points will be deducted for each error, whether it is an error of omission or inclusion. Points will be deducted for other report deficiencies.

- **Chemical Equilibrium:**

The entire grade for this experiment will be based on the correctness, neatness, and completeness of the report.

| | |
|---|---------------|
| The grading scale will be no stricter than: | Points Needed |
| A 100 - 88 % | 621 |
| B 87 - 74 % | 522 |
| C 73 - 60 % | 424 |
| D 59 - 46 % | 325 |
| F less than 46 % | Less than 325 |

- **Hexacation Analysis:**

Five points will be deducted for each error, whether it is an error of omission or inclusion. The schematic is worth a total of 10 points. Points will be deducted for UNNECESSARY steps/reagents as well as for OMITTED steps/reagents. The schematic will be for the student's unique set of cations ONLY. Points will be deducted for other report deficiencies.

This is a timed experiment! You have 120 minutes to do the entire experiment (schematic, perform, analysis, and turn in report). You may not confer with other students.

Late penalty: One point will be deducted for every 5 minutes, beyond the 120 minutes, that you are late turning in your results.

- **HPLC Analysis of a Multicomponent Sample:**

Five points will be deducted for an error in identification of any of the peaks in the unknown chromatogram. Your grade will depend heavily on the completeness of your report, which will include results interpretation, chromatograms, and calibration curves. Points will be deducted for other report deficiencies.

- **Equilibrium Constant of a Weak Acid:**

For the unknown acid, 0.5 points will be deducted for each 5% error in molarity (up to a total of 7 points). For the value pH, 0.5 points will be deducted for each 5% error (up to a total of 6 points). The grading on the remaining 12 points will be based on the correctness, neatness, and completeness of the report.