

General Chemistry Laboratory II

CHE 121L-012

Spring 2009

Class time: T 9:25 - 12:25

Location: SC 426

Instructor: Dr. Stefan Paula
SC 445
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572-6552

Office hours: W 1:00 – 3:00
F 12:00 – 2:00
or by appointment

Text: Laboratory Manual, General Chemistry II, NKU, 6th Edition

Materials: Laboratory record book, calculator, and safety goggles

Corequisite: General Chemistry 121 Lecture

Prerequisite: General Chemistry 120 Lecture and Laboratory

Departmental Student Learning Outcomes Relevant for this Course:

1. Explain the major concepts and experimental findings in the chemical sciences.
2. Demonstrate the ability to carry out experimental protocols using modern instrumentation and methods.
3. Utilize critical thinking skills to apply concept knowledge and adapt experimental techniques to: a) form and test hypotheses and b) solve scientific problems
4. Compile, critically evaluate, and interpret scientific information and data.
5. Effectively communicate scientific information through written and oral means.
6. Apply effective group strategies to solve scientific problems.
7. Apply computer technology and other technologies in the comprehension, interpretation, and presentation of the chemical sciences.

Course Objectives:

1. Explain the colligative properties of solutions and how they can affect chemical reactions.
2. Apply acid/base theory to interpret the chemical properties of various substances.
3. Determine rate laws of chemical reactions through interpretation of empirical data.
4. Explain observations on chemical reactions based on chemical equilibrium.
5. Calculate and measure cell potentials using electrochemistry standards.
6. Determine anions present in an unknown sample through qualitative experimentation.
7. Know how to keep a laboratory notebook, record data, analyze data, and write reports, including introductions and discussions.
8. Learn how to use computer programs to analyze data.
9. Demonstrate an understanding of chemical principles and the ability to interpret data through written formal laboratory reports.

Preparation: Students are expected to come to class with a thorough understanding of the principles involved in the experiment, the goals of the experiment, and the procedures to be followed. This requires reading the experiment's description ahead of time, completing the protocol in the laboratory notebook, and carrying out any pre-laboratory exercises, as noted in the schedule.

Blackboard: Students will be expected to use Blackboard to receive announcements and any additional information about class. Students should also check Blackboard before class to find out about any announcements. Links to Disability Services, the Learning Assistance Program, and the NKU Honor Code can be found on Blackboard also.

Laboratory Record Book: The laboratory record book will be used to prepare a protocol for each experiment (before coming to class) and to record potential changes and all data collected (as the experiment is conducted). The protocol **must** be completed before students will be allowed to carry out the assigned experiment. Students will be required to use only their own protocol. Copies of the notebook pages are to be handed to the instructor after each experiment has been completed. Each record book entry should contain the title, date, purpose, and special safety precautions of the experiment along with protocol and data. See pages v-viii in the laboratory manual for more information about the record book and for sample record book pages.

Laboratory Report: For most experiments, the laboratory report consists of completed data sheets from the laboratory manual, along with calculations and answers to questions at the end of the experiment. All data and calculations must be recorded to the proper number of significant figures. All pages need to be written neatly and turned in stapled and in proper order. Points will be deducted for sloppy laboratory reports. Electronic copies of laboratory report pages may also be found on the General Chemistry Website: http://www.nku.edu/~chemistry/general_chem/. These pages may be completed electronically and then printed or printed first and then filled in by hand. Even though students will frequently conduct work in pairs, the reports are to be written individually. If two reports show great similarity, only one will be graded and the score will be split.

Formal Laboratory Reports: For two experiments, full formal laboratory reports will be required instead of pages from the laboratory manual. Information about the formal laboratory report can be found in the laboratory manual on pages xix-xx. See the schedule for the experiments which will require a formal laboratory report.

Due Dates: Protocols, including the answers to the pre-laboratory questions, will be checked at the beginning of class for completeness and effort. Each report is due at the beginning of the laboratory period following completion of the experiment. Late work will be penalized by a 10% deduction for each day late. If a student is absent on the day a report is due, it is his or her responsibility to turn in the laboratory report on or before the due date to avoid losing points. **Reports later than one week late will not be accepted.** Due dates are subject to change.

Exams: There will be two exams (see schedule).

Safety: All safety rules must be obeyed. Violation of these rules will result in dismissal from the laboratory and a grade of zero for that experiment. Safety rules can be found in the laboratory manual on page ix-x. **No shorts or sandals are allowed in the**

laboratory. Bags must be stored in the shelves in the back of the room and not left on the floor.

Attendance: If a student misses a laboratory experiment because of a **documented emergency**, a makeup in a different section may be scheduled by contacting the instructor within one weekday of the missed experiment. The date of the makeup is at the instructor's discretion and subject to the availability of materials and space. A **maximum of two make-ups** is permitted. Failure to follow this policy will generally result in a grade of zero for a missed experiment.

Grading: Points will be awarded as follows:

Laboratory record book	25 points each
Pre-laboratory questions	5 points each
Regular Reports	55 points each
Formal and Aspirin reports	75 points each
Exams	130 points each

Grading Scale:	A	≥ 90% of total points
	B	80 – 89% of total points
	C	70 – 79% of total points
	D	60 – 69% of total points
	F	< 60% of total points

TENTATIVE Schedule

<i>Date</i>	<i>Experiment</i>	<i>Report</i>	<i>Points</i>
January 13	Gravimetric Determination of Phosphorus (page 67)	71-72	80
January 20	Distillation and Gas Chromatography (page 43)	47-48	
January 27	*Aspirin Synthesis (pages 19 + 27)		105
February 3	Aspirin Synthesis, continued	29-32	80
February 10	*Freezing Point Depression (page 59 + 63)	65-66	105
February 17	*Kinetics (page 75 + 81,82)	83-86	85
February 24	Chemical Equilibrium (page 33)	38-42	80
March 3	Exam 1		130
March 10	Spring Break		
March 17	Synthesis of SnI ₄ (page 93)	97-100	80
March 24	Acids, Bases and Buffer (page 1 +7)	9-12	80
March 31	*Titration Curve (page 101 + 105)	107-110	85
April 7	*Analysis of Household Chemicals (page 13 + 15)	17-18	105
April 14	The Qualitative Analysis of Anions (page 87)	91 – 92	80
April 21	Electrochemistry (page 49)	55-58	80
April 28	Exam 2		130

Every experiment requires a protocol that is due before the laboratory starts.

Experiments noted with * also require answers to the pre-laboratory questions in addition to the protocol.

Other Information:

The last day to drop the course with an X is February 2nd, the last day to drop with a W is March 30th.

Policies of the Department of Chemistry at Northern Kentucky University

All items on syllabi are subject to change by the instructor.

Students are responsible for reading and understanding all items on the syllabi. Any items not understood must be brought to the attention of the instructor within the first two weeks of class.

The work you will do in any course is subject to the Student Honor Code. The Honor Code is a commitment to the highest degree of ethical integrity in academic conduct, a commitment that, individually and collectively, the students of Northern Kentucky University will not lie, cheat, or plagiarize to gain an academic advantage over fellow students or avoid academic requirements.

Cheating will not be tolerated. In accordance with the Code of Student Rights and Responsibilities, faculty members have the right to determine actions to be taken when a student is caught cheating.

Faculty members reserve the right to dismiss or to have removed a disruptive student from their classrooms.

This is a web enhanced course. Students meet at regularly scheduled class time and will need access to the internet to fulfill course requirements.

Students entitled to consideration because of a disability may find policies at <http://www.nku.edu/~disability/>