

Chemistry 101L

Tuesday & Thursdays from 7:35 – 10:00 pm

Room: CMS 210

Section 0132

Instructor C. Mallory

4. REQUIRED LABORATORY MANUAL:

“Chemistry in the Laboratory” by J. M. Postma, J. L. Roterts Jr.; J. L. Hollenberg; W. H. Freeman and Company, 7th edition You are required to have your laboratory manual by the 2nd class meeting (September 4th 2014).

5. REQUIRED LABORATORY NOTEBOOK:

This is a perforated spiral carbon copy laboratory notebook available in the L.A.M.C. Bookstore (Item number is 978-1-930882-74-4). You are required to have your laboratory manual by the 2nd class meeting (September 4th 2014). *You are required to report all laboratory work in your Laboratory Notebook directly* (no other sources).

6. SCIENTIFIC CALCULATOR

Need not to be an expensive type, but it must perform the following operations: Addition, Subtraction, Multiplication, Division, Square Root, $1/x$, and log. You are required to have your calculator with you for all class sessions (lectures and labs).

7. SAFETY GOGGLES

You are required wear safety goggles (Z87-appropriate for chemistry) at all times during laboratory work. Approved safety goggles are available in the L.A.M.C. Bookstore and any college or university Bookstore (Z87-appropriate for chemistry). You are required to purchase your own safety goggles and you may wish to keep them in your laboratory locker. You are required to have your safety goggles by the 2nd class meeting (August 28th and 29th 2013).

8. PERIODIC TABLE OF THE ELEMENTS

You are required to have your own Periodic Table of the Elements with you, for all class sessions.

STUDENT LEARNING OUTCOMES

1. Describe, explain and model chemical and physical processes qualitatively at the molecular level in order to explain macroscopic properties.
2. Solve quantitative chemistry problems through integration of multiple ideas and demonstrate reasoning clearly and completely.
3. Perform laboratory techniques safely and accurately, analyze results of laboratory experiments, evaluate sources of errors, and use laboratory notebook according

LABORATORY WORK

In all laboratory, each student is responsible for the contents of their locker, and the majority of the experiments are performed individually. The few experiments, which are performed in pairs, are indicated in the Laboratory schedule (2); For these experiments, each student:

1. **Must take active part in the work,**
2. Report his/her data individually,
3. Do his/her own calculations,
4. **Turn in an individual lab report for grading purposes,**
5. **Will be assigned an individual grade for every activity.**

Laboratory Reports are due on Tuesdays following the week during which the experiments have been performed (this is to allow working students to meet the deadline).

- Late reports are accepted with a 15% **penalty per day.**
- After the instructor has returned the graded lab reports to the class, lab reports for that particular experiment **are no longer accepted for grading.**

In order to work efficiently and meet the required deadline for turning in the lab reports, you must come to the laboratory well prepared.

This means:

1. Read carefully (several times, if needed) the Experiment you will perform (both Principles and Procedure) prior to coming to the lab.
2. Think about what will be doing and plan ahead.
3. Prepare your Laboratory Notebook in advance
4. After the third laboratory session, you may not work in the laboratory if you do not have a Laboratory Notebook.
5. The laboratory portion of the course makes up **35% of your grade:**
 - Laboratory Reports and Unknowns: 15%
 - Laboratory Exams: 20% (open lab notebook)

THERE ARE NO MAKE-UP LABS

**Student laboratory practices and responsibilities**

- Laboratory safety is everybody's responsibility. As a student in the chemistry lab you are responsible for understanding and following the guidelines below.
- Failure to do so may result in a reduction in your laboratory grade.

General practices:

- Plan and conduct lab experiments in accordance to established directions and safe practices.
- Report unsafe practices, conditions and injuries to instructor or department chair.
- Maintain awareness of current safety or environmental practices.
- Exercise reasonable neatness as one of the best ways to avoid accidents and injuries.

Safe practices in the laboratory:

- Know location of exits, fire extinguishers, fire blanket, fire alarm, safety shower, eye-wash stations and broken glass container in the laboratory.
- Wear eye protection whenever working with flames, concentrated acids and bases or instructed by the instructor.
- Restrain long hair, loose clothing and dangling jewelry.
- Closed-toe shoes must be worn at all times.
- Clean your work station at end of laboratory from spilled chemicals, used matches, and other debris.

INSTRUCTIONS FOR LABORATORY NOTEBOOK

- Each student must have a spiral bound copy (bottom page) perforated Laboratory Notebook (100 pages) in which to record data and observations, do calculations, and analyze results of the lab work.
- The Lab Notebook must be brought with you to every lab session** and all data and observations must be recorded directly into the Notebook (no where else) and in ink (no pencil).
- Laboratory records are legal documents in industry and research. They are required to support patent applications or to resolve disputes or originality of research.
- The laboratory notebook is a permanent record of all work performed in the laboratory. It is the place where a scientist records all of his or her data, measurements, and observations for future reference.
- In an academic setting the lab notebook is the storehouse for all information the researcher will use to write articles for scientific journals. In an industrial setting the lab notebook is not only a record of the experiment. It is a legal document that may be critical for obtaining a patent. It should contain enough information so that another scientist could read the notebook and repeat the experiment.
- The most critical skill that you must learn is to neatly **record all your measurements and observations directly in your lab notebook at the actual time you make them.** It is improper to scribe data on a loose sheet of paper or to rely on your memory to preserve your observations. Learning to keep complete, reliable records is an important part of learning how to become a good scientist. Here is some general information about keeping a lab notebook and also some information about the specific sections you should have for each experiment.

General Information

- Your notebook **must be bound**, having duplicate style sheet. Do not remove original pages from the notebook.
- Write your name, Chemistry 101, your lab section, and semester on the inside front cover.
- Write only on the front side of each white sheet. A duplicate copy will automatically appear on the yellow/blue sheet behind it. Apply sufficient pressure to make a legible copy, but not so much that the writing appears on the next pair of sheets. Remember to place the cardboard between each pair of sheets.
- Unless your lab notebook has a table of contents, **reserve the first two pages for a table of contents.**
- All entries in your lab notebook must be made in **permanent ink**. If you make an error, **do not attempt to erase it or use a whiteout. Just draw a single line through the incorrect entry.**
- Learn to write in the past tense, third person (without the use of personal pronouns such as I, we, and my).

Sections of the Notebook For Each Experiment

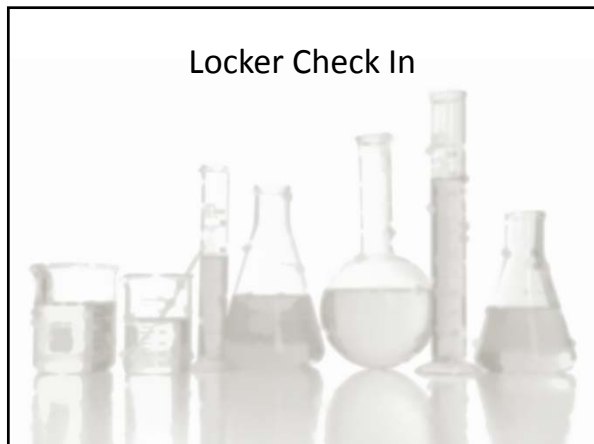
- Title:** Begin each new experiment on a blank page. Put the full title of an experiment on top of that page. (Write the same title in your table of contents along with the starting page number).
- Objective:** Under the title, list the specific objective(s) for the experiment in concise statement(s). Write a short statement (one or two sentences, in your own words) of the purpose or the goal of the experiment. If experiment contains more than one part, indicate objective of all parts of the experiment.
- Procedure:** Procedure should be written in the past tense and third person, including amounts of each reagent used, size of glassware, and equipment(s) used. You may write this either as a paragraph or by numerical order. Use only the left column of the notebook. Right column will be used for observations and data to be recorded.
*NOTE: The three sections above must be completed before you come in to the lab (no lab will be started unless the following sections are completed).
- Observations and Measurements:** You should record observations of everything that happens during the experiment as it happens using right column of the notebook. Especially pay attention to any change in color, the amount of time it takes for a reaction to occur, unexpected occurrences, temperature readings, amount of solvent used in the reaction, etc. Also write down any modifications you make to the procedure in this section. All numerical data should be recorded directly in the notebook with the proper units. Any data recorded by an instrument on another piece of paper, such as spectrum, should be permanently attached into the notebook as instructed. Record the model number of the instrument, the serial number, condition, and setting used.
- Calculations:** All sample calculations must be shown in the notebook, including the subtracting of masses to find the mass of a sample, the use of density to convert between mass and volume, the use of molecular weight (or molar mass) to convert between mass and moles, etc. Remember to label all numbers with the appropriate units. Your calculation section must include a balanced chemical equation, calculation of the theoretical yield, and calculation of the percent yield of product.
- Results:** Summarize experimental findings in a tabulated format with correct significant figures and appropriate units.
- Conclusion:** The conclusion section should include a restatement of what was accomplished in the experiment, a summary of the results, and an analysis of these results. If the results are different from what you expected, discuss possible sources of error. Also, write down any suggestions you have for improving procedure.
- References:** Give the complete bibliographic information for the laboratory text used. (Title, author, publisher, date).
- Questions and Problems:** Answer questions and problems assigned either from laboratory manual or provided by your instructor

TENTATIVE LABORATORY SCHEDULE

LABORATORY SCHEDULE**

Week	Date	Activity
1	T - Sept. 2 Th - Sept. 4	Introduction to Laboratory Procedures & Proper use of Lab Notebook; Check-In & Safety Video (view at home) Experiment #1: Scientific Measurements
2	T - Sept. 9 Th - Sept. 11	Experiment #2: Mass and Volume Relationships Experiment #2: Mass and Volume Relationships
3	T - Sept. 16 Th - Sept. 18	Study Assignment A - The Language of Chemistry: Chemical Nomenclature Experiment Experiment #4: Reactions of Household Chemicals
4	T - Sept. 23 Th - Sept. 25	Experiment #7: Chemistry of Oxygen (2) Experiment #7: Chemistry of Oxygen (2)
5	T - Sept. 30 Th - Oct. 2	Experiment #8: Determination of a Chemical Formula; The Reaction of Iodine with Zinc (2) Experiment #8: Determination of a Chemical Formula; The Reaction of Iodine with Zinc (2)
6	T - Oct. 7 Th - Oct. 9	Experiment #5: A Cycle of Copper Reactions (2) Experiment #5: A Cycle of Copper Reactions (2)
7	T - Oct. 14 Th - Oct. 16	LAB EXAM #1 (Experiments 1, 2, 4, 7, and 8) Experiment A: Net Ionic Equations - (Handout)

Locker Check In



Before you go home...

- Your partner**
 - Know their name
 - Know their phone number
 - Know their email address
 - Know their text address
- Your locker**
 - Know your locker number
 - Know your locker combination

THURSDAY REQUIREMENTS

1. Purchase Spiral Bound Notebook
2. Purchase Laboratory Notebook
3. Purchase Goggles
4. Read Exp 1 – Scientific Measurements
5. Prepare Spiral Bound Notebook for Exp 1
6. Remember Classroom Requirements
7. Watch Safety Video