

CHM 2046L – Fundamentals of Chemistry Laboratory

- Objectives**
1. To teach students basic chemical laboratory techniques, in particular best practices in lab safety; and
 2. To help student learn to apply fundamental chemical concepts in solving chemical problems in the laboratory.

Pre-requisite CHM 2045

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Text *Hands on Chemistry*, by Jeffrey Paradis and Kristen Spotz

Required Materials (available from the Univ. of Central Florida bookstore)

- Bound composition book (no loose leaf, perforated, or carbon paper)
- 10 mm/cm graph paper
- Chemical safety glasses
- Lab coat

Overview

This course provides an introduction to basic laboratory experiments and techniques in the areas of colligative properties, gas laws, calorimetry, kinetics, equilibrium, quantitative analysis, electrochemistry, and spectroscopy. Students must bring the lab manual, lab notebook, and a scientific calculator to lab for each meeting. Students are required to study the lab procedure for that week in advance and write a “pre-lab” as detailed below. Preparedness for lab will be evaluated via a quiz administered at the beginning of each meeting. Following the quiz, the instructor will discuss the chemical and physical concepts behind the lab session. The students will then execute the lab procedure, working in pairs when possible. Observations and data will be recorded in the notebook. Complete lab entries will be written based on the data collected. A complete lab notebook entry will also include pre-lab and post-lab questions from the textbook for that experiment.

Lab Assignments/Topics

<i>Week</i>	<i>Title</i>
1	Syllabus; safety
2	Measurement and proper use of glassware (5-1)
3	Discovering the gas laws (15-1) and gas stoichiometry (16-1)
4	Limiting reactants: how much BaSO ₄ can we make? (8-1)
5	Introduction to thermochemistry (17-1) and Hess’s law (19-1)
6	Colligative properties (22-1)
7	Titrations of ions in water: the hard truth (13-1)
8	Spectrophotometric analysis: phosphates in water (14-1)
9	Determining the rate law: a kinetics study (24-1)
10	Determining the equilibrium constant of a complex (25-1)
11	LeChatelier’s principle: “stress management” (26-1)
12	The properties of buffers (28-1)