

INORGANIC CHEMISTRY – CHM 205 Lab
North Central College
Fall 2002, Brandt

- Lab:** Thursday 2-5:30 pm in SC 114.
Text (WWW): You are responsible for bringing in the assigned laboratory assignment. It can be found at <http://paul.brandt.faculty.noctrl.edu/>. Two laboratory notebooks and protective eyewear are required.
Instructor: Dr. Paul F. Brandt, SC 119, Phone 637-5193, (630) 357-0193(H), pabrandt@noctrl.edu
Office Hours: M 2 – 4, W 3 – 5, and Th 9 - 11 or stop by my open door at any time.

Course Description: This lab will be inquiry based. You will be asked to perform simple experiments and determine trends. Undoubtedly there will be instances when the trend is broken and you will need to observe the offending data and explain the reasoning behind it.

Course Aim: You will be asked to do many-many reactions this term. There is no way that you will be able to remember them all. However, there will always be some underlying principle behind what you see happening. I would ask that you try to keep these principles in mind when trying to determine the outcome of the reactions you encounter.

Schedule

Sept 19	Reactions of Cations with Anions
Sept 26	Some Reactions of Cations
Oct 3	Some Reactions of Oxo Anions
Oct 10	Periodicity in the Activity of the Elements
Oct 17	Competitive Precipitation and Complexation Reactions
Oct 24	Iron in Myoglobin
Oct 31	Qualitative Analysis Scheme
Nov 7	Qualitative Analysis Scheme
Nov 14	The Widely Varying Colors of <i>d</i> -Block Metal Complexes
Nov 21	Metal Ion – Protein Interactions

Evaluation:

Notebook	20%
Write-up	70%
Discretionary (e.g., lab clean-up, attitude, etc.)	10%

All points in the lab will total 150 points of the 750 points in the course (20%). **You must pass the lab in order to pass the course. Labs are due at the beginning of the following lab period.** Late labs will be assessed a 10% late fee per day. Should there be any problems attending the lab on a particular day or at the time allotted, you must contact me by phone or e-mail prior to the meeting time.

Academic Dishonesty: Your lecture syllabus referred to this subject extensively but the lab write-ups are often an area of difficulty for students. You will be working in pairs throughout the term. However, this does not mean that you will be turning in duplicate work. Everyone keeps his or her own lab notebook and these will be as individualized as your own personality. Although you should talk over your data with your partner, and probably even the meaning of the data, **you should nonetheless say what the data means in your own words.**

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Laboratory Notebooks: Your laboratory notebook is a record of all your observations, data and calculations from your work in the lab. In the real world, laboratory notebooks are taken very seriously, as they are here! Scientists in governmental, educational and industrial labs are expected to maintain legible, thorough laboratory notebooks, which document their work. A well-written laboratory notebook will enable a company to protect possible patent rights and prevent wasting energy from repeating work previously done. The laboratory notebook will protect the institution and individual scientist in any scientific misconduct or fraud cases.

Faculty evaluation of your laboratory performance will be based upon reading your laboratory notebook and “write-up” rather than upon observing you directly in the laboratory. Therefore, your notebook must be designed to document your technique as well as your results in carrying out a laboratory procedure. The following guidelines have been designed to enable you to communicate effectively through your laboratory notebook.

General Guidelines

1. Always bring your laboratory notebook to each laboratory session. Not bringing it is like going to a job interview without knowing anything about the company. You’re unprepared! Should you show up without it, I will ask you to go to the bookstore to buy another. Writing information down on scraps of paper is unacceptable and if seen, these scraps will be thrown away.
2. Label the front cover with your name, course number and lab section.
3. All data, observations and calculations must be recorded directly into the lab notebook with indelible ink - preferably black.
4. Data can often be concisely incorporated and more easily interpreted if it is in the form of a table. Strive to make the notebook readable and understandable.
5. If a mistake has been made, draw a single line through the entry and note the correction. Never completely delete any entry from a laboratory notebook by erasing, using liquid paper, or by removing pages.
6. You are expected to take the time to write neatly and legibly.
7. You must have your notebook initialed and dated by yourself and the instructor at the end of each laboratory period.
8. Word-processed work must be in written in a standard 12-point font.

Your “write-up” will consist of two parts. The *Date, Title, Partner, Objective, Procedure and Data* sections will be recorded in your laboratory notebook during the laboratory session. The *Date, Title, Results, Conclusion, and Questions* sections will be handed in as a word-processed paper. This paper will be combined with the lab notebook for the cumulative grade. The following gives you details of what should be included in each section.

To be included in the laboratory book:

- **Table of Contents:** After each lab you should complete the Table of Contents at the front of the book where you have left a few blank pages to tell others where to find the experimental information.
- **Page Numbers:** Since you probably won’t have a notebook with page numbers already in the book, you need to put them in yourself.

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- **Date and Partners' Name:** The date the lab was performed should appear at the top of the first page for each laboratory session. Your partners' name should also appear here.
- **Title:** An appropriate title for the laboratory should appear on the top of the page. This title and the pages on which it appears should be put into your table of contents.
- **Objective:** You should state in your own words (paraphrase rather than merely quote the objectives) what you would accomplish by doing this lab. This will include the purpose of the lab with respect to what you will synthesize, isolate and/or observe as well as what techniques you will learn by doing this lab.
- **Procedure & Data:** You should include one or two brief statements that succinctly describe the procedure next to, or near, all data. Include comments to document good (or bad) technique. You should record any observations (e.g. color, temperature changes, gas evolution, etc.) so that somebody who is using your book as a guide will know that they are performing the experiment correctly. You must record your data directly into your lab book. Any loose pieces of paper found during the lab section will be tossed into the garbage. It is recommended that you set up tables for data collection. All data must be clearly labeled. This section will not be graded for neatness although mistakes and corrections must conform to the procedures outlined above.
- **Initials:** Obtain your instructor's initials and record your initials and the date as well.

Lab Report: A word-processed document. All graphs should be made using a spreadsheet such as MS Excel™. You may neatly hand-write calculations but not equations since MS Word™ has the ability to do subscripts and superscripts.

- **Date, Your Name, and Your Partners' Name:** The date on which the laboratory was performed should appear on the top of the first page for the laboratory report. Yours' and your partners' name should also be at the top of the first page of each laboratory report.
- **Title:** An appropriate title for the laboratory should appear on the top of the page.
- **Results:** This is a section for your professor to see the data you collected. Data should be organized in neat, easy to read tables. Be sure to include all of your data; any color changes, state changes, etc must be documented along with numerical data. Graphs and calculations should appear in this section. You need not show all your calculations, but you should include one example for each type of calculation. All numbers need appropriate units. Summarize your results and calculations in neatly prepared graphs and tables.
- **Discussion:** Discuss the meaning of your data here. Use the questions posed to you in the handout as a springboard for the Discussion. Be sure to answer all questions. This is the most important section and the bulk of the grade is incorporated here. Use 3rd person, past tense and the passive voice.
- **Conclusion:** This section should only be a few sentences long. You should address all of your objectives and how you accomplished each of them. Be sure to include any major numerical results, e.g., "The concentration of calcium ion in pond water was determined to be 4.0 mM."