

## Advanced Inorganic Chemistry Laboratory, Chem 3150 Fall 2007

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<b>Course Description</b>	Required course for the ACS-certified BS degree and an elective in the non-ACS certified chemistry BS degree. Draws from and complements topics covered in CHEM 4380. Focuses on experimental methods common to inorganic chemistry, including inert atmosphere syntheses, specific characterization techniques, and affiliated instrumentation. Experiments related to coordination compounds, organometallic chemistry, bioinorganic chemistry, and materials science are included. Prerequisite: Grade of C or better in CHEM 3411, 3520; co-requisite 4380.	
<b>Course Objectives</b>	Apply previously acquired lab skills to new systems. Gain experience synthesizing and manipulating compounds under air-free conditions. Gain new exposure to inorganic areas of bioinorganic chemistry, materials science, and organometallic chemistry. Learn to apply new characterization techniques including magnetic susceptibility, cyclic voltammetry, UV-visible electronic spectroscopy, and multi-nuclear NMR spectroscopy.	
<b>Grading</b>	<i>Technique</i> 10 % (efficiency, safety, lab skills) <i>Lab notebook</i> 10 <i>Written Reports</i> 80 % (sample spectra, 4 minor reports and 1 major report)  A 100 - 89%    B 88 - 79    C 78 - 69    D 68 - 55    F < 57 Presentation counts in your reports! This includes spelling and grammar	
<b>Web resources</b>	All experiments are posted online using my password-protected Chem 3150 website.	
<b>Lab Notebook</b>	A carbon-copy lab notebook like the one used in organic chemistry is required. The brand of notebook is unimportant, but the pages must be bound and it must be possible for you to give me carbon-copy pages from your day's lab work. I will be checking your daily lab progress for experimental setups used, observations, results, and spectra collected, data filenames, etc.	
<b>Lab Reports</b>	All lab reports will have 1) Introduction, 2) Experimental, 3) Results and Discussion sections. More details on my expectations can be found on my lab writeup advice on the Chem 3150 webpage.	
<b>Minor Reports</b>	Due one week after the lab work was completed. (points deducted for late work) These reports may be hand written in your notebook. You will hand in the carbon-copy pages as you did in organic chemistry. Even though handwritten the report should flow logically from one idea to the next, following the general outline described on my Chem 3150 website. Spectra may be attached to the report pages. Refer to your data to support your conclusions!	
<b>Major Reports</b>	Due two weeks after the lab work was completed. (points deducted for late work) Must be typed (double spaced): appropriate use of spreadsheets and wordprocessors expected. Some approximate guidelines are 1. Abstract: one paragraph (brief summary of results) 2. Introduction: 1 page, with at least five cited references 3. Experimental: 1 page (as required) 4. Results: spectra, graphs, tables (all with meaningful titles) 5. Discussion: 2 pages, questions answered, summary and conclusions from results, refer to introduction	
<b>Safety Goggles</b>	You must use appropriate safety goggles when working in lab. Your goggles should meet the ANSI Z.87 standard for laboratory eye protection. Specifically, they must have side and top shields to protect your eyes from chemical spills. Examples of eyewear are posted on my 1450 webpage.	
<b>Daily Format</b>	Each of you will be working on a different experiment each week according to the rotation set out on the next page. The lab manual contains sufficient detail to allow you the opportunity to synthesize and investigate some very interesting chemical systems. Such independence carries with it your responsibility for advanced planning for each week's work. To manage this, work will be divided into three rotations throughout the semester. You may work on the assigned experiments during that rotation. Before leaving lab, give me that day's carbon-copy pages from your lab notebook.	
<b>Technique</b>	Good lab technique includes advanced preparation, safe work, and efficient use of lab time. Advance planning includes such things as acquiring specialty chemicals or equipment. It also includes discussions with me to learn how to operate new equipment or how to setup certain experiments. Safe work includes the use of appropriate eye protection and proper care using chemicals and equipment. Efficient lab workers maximize their productivity by planning ahead and performing multiple tasks. Instead of waiting to be told, ask yourself "What else needs to be done while I'm waiting." If you finish early on an experiment or have "down time" while a synthesis runs, use the time to outline your summary writeup or plan for the future week's work. Maximum use of the in-class time can greatly reduce headaches later on while you are alone at home.	

## Laboratory Activity Schedule

Tues Date	Assignments due	
Aug 28	<u>Introduction</u> : syllabus, expectations, grading <u>Plan</u> : pair up, equipment for next week's work <u>Practice</u> : recording ATR IR, UV-vis, EPR spectra	
Sep 4	First Rotation	sample spectra from Aug 28
11		
18		First lab report
25		
Oct 2		
9	Second Rotation	Second Lab Report
16		
23		
30	Third Rotation	
Nov 6		Third Lab Report
13		
20		Fourth Lab Report
27		
Dec 4	LAB CLEANUP DAY	Fifth Lab Report