

Advanced Inorganic Chemistry Laboratory

Chem 3150, Spring 2019

Lab (Laney-Manion 302): Tuesday 2:40 – 5:20 pm

Instructor: Dr. Lei Yang
Office: Laney Hall 203B
Phone: 501-852-0711
Email: lyang@uca.edu

Office hours: Monday, Wednesday and Friday, 9:00 am – 11:00 am

Use this time. It works best if you come to my office prepared with specific questions about lecture, lab or homework. Other times are available by appointment.

Text: Lab manuals can be downloaded from Blackboard

Grading	Possible points
First day practice (50 pts)	50
Technique (20 pts each)	100
Lab notebook (20 pts each)	100
Minor lab reports (50 pts each)	250
Major lab reports (100 pts each)	500
TOTAL POSSIBLE	1000

Grades: **A = 900 – 1000 points**
B = 800 – 899.99
C = 700 – 799.99
D = 600 – 699.99
F < 600

Important Dates Mar. 29 Last day to drop a course with a W

Lab notebook The pages of your lab notebook must be bound. The notes have to be written by using permanent ink. Pencils or computers are NOT allowed to make notes. I will check your daily lab progress for experimental setups used, observations, results, and spectra collected, data filenames, et al and return it to you on each Thursday in Advanced Inorganic Chemistry lecture for you to write reports.

Minor reports Due **one** week after the lab work was completed. These reports may be hand written on your notebook. The report should focus on data summery/organization and brief interpretation/interpretation of results. The outline of your conclusion should be made in minor reports. The minor reports should flow logically from one idea to the next, following the general suggestion described in Major Laboratory Reports Write-up Advice. Spectra should be attached to the notebook pages.

Major reports Due **two** weeks after the lab work was completed (10 points/day penalty will be applied for reports submitted after deadline). All major reports must be typed

and printed. Please see the Major Laboratory Reports Write-up Advice for specific requirements on format and sections. **Electronic copy won't be accepted.**

Safety 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. No food, drink, open-toe shoes and short pants in labs.

Daily format Each group will be working on experiments according to the rotation set. 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, hand in your notebook to the instructor.

Technique 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 write-up 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.

Policies **1. Attendance**
Three unexcused absences will result in a W grade.

2. Makeups
No makeup lab will be offered.

4. Regrade
All regrade requests should be made to the instructor. When inquiring about a possible regrade, please do NOT make any marks on the item in question.

5. Academic Integrity Statement:

The University of Central Arkansas affirms its commitment to academic integrity and expects all members of the university community to accept shared responsibility for maintaining academic integrity. Students in this course are subject to the provisions of the university's Academic Integrity Policy, approved by the Board of Trustees as Board Policy No 709 on February 10, 2010, and published in the Student Handbook. Penalties for academic misconduct in this course may include a failing grade on an assignment, a failing grade in the course, or any other course-related sanction the instructor determines to be appropriate. Continued enrollment in this course affirms a student's acceptance of this university policy.

6. Disabilities Act Statement:

The University of Central Arkansas adheres to the requirements of the Americans with Disabilities Act. If you need an accommodation under this Act due to a disability, please contact the UCA Office of Disability Services, 450-3613.

7. Building Emergency Plan Statement:

An Emergency Procedures Summary (EPS) for the building in which this class is held will be discussed during the first week of this course. EPS documents for most buildings on campus are available at <http://uca.edu/mysafety/bep/>. Every student should be familiar with emergency procedures for any campus building in which he/she spends time for classes or other purposes.

8. Title IX Disclosure

If a student discloses an act of sexual harassment, discrimination, assault, or other sexual misconduct to a faculty member (as it relates to "student-on-student" or "employee-on-student"), the faculty member cannot maintain complete confidentiality and is required to report the act and may be required to reveal the names of the parties involved. Any allegations made by a student may or may not trigger an investigation. Each situation differs and the obligation to conduct an investigation will depend on those specific set of circumstances. The determination to conduct an investigation will be made by the Title IX Coordinator. For further information, please visit: <https://uca.edu/titleix>.

Tentative Lab Schedule

Date	Topic	Dead line
Jan 15 (T)	Practice: recording ATR IR, UV-vis, EPR spectra	
Jan 22 (T)	First Rotation (5 weeks, two experiments)	First lab report
Jan 29 (T)		
Feb 5 (T)		
Feb 12 (T)		Second lab report
Feb 19 (T)		
Feb 26 (T)	Second rotation (3 weeks, one experiment)	Third lab report
Mar 5 (T)		
Mar 12 (T)		
Mar 19 (T)	Spring Break	
Mar 26 (T)		
Apr 2 (T)	Third rotation (3 weeks, two experiments)	Fourth lab report
Apr 9 (T)		
Apr 16 (T)		
Apr 23 (T)	Lab cleanup day	Fifth lab report
Apr 30 (T)	Final week	Sixth lab report

Experiment list

	Experiment	Characterization tools	Other tool
1	First day practice	UV-vis, IR, EPR	Inert atmosphere cannula transfer
First rotation			
2	WO ₃ , H ₂ intercalation	IR, Mag. Suscept.	Conductivity
3	Ammine-borane hydrolysis	IR, NMR (¹¹ B and ¹ H)	
4	Doped ZnS phosphors		UV exposure, Tube furnace
5	Cu(Gly-Gly) hydroxyl radicals	UV-vis	
6	Aerobic alcohol oxidation	¹ H NMR, IR	
7	Polyvalent iodine complexes	UV-vis, ³¹ P NMR	
8	KTp* synthesis by MW methods and TM complexes	UV-vis, ¹¹ B NMR, IR	
Second rotation			
9	Metal Complex UV-vis/magnetism	UV-vis, Magnetic measurement	
Third rotation			
10	Co-NO ₂ linkage isomers	UV-vis, IR (variable T)	
11	Cu(en) _x ²⁺ , Ni(en) _y ²⁺ Job plots		
12	RuCl ₂ (dppb)(phen) isomerism	³¹ P NMR, E-chem	Inert atmosphere
13	Redox behavior of iron complexes	¹³ C NMR, E-chem	Inert atmosphere
14	Mo-Mo multiple bond	Solid UV-vis, IR	Inert atmosphere
15	Iron porphyrin complexes	NMR, Magnetic measurement	
16	Suzuki cross-coupling reaction catalyzed by Ni(II) complexes	¹⁹ F NMR, UV-vis, FT-IR	Inert atmosphere

Names _____

First rotation:

Lab 1: _____

Lab 2: _____

Third rotation:

Lab 1: _____

Lab 2: _____