

CHM 3610L: INORGANIC CHEMISTRY LABORATORY

Spring 2019

Location: Hernandez 110

R 2-4 (0830-1130)

F 2-3 (0830-1025)

Instructors:	Devender Singh (CLB 403)	Jhonti Chakraborty (CLB 419)
Email:	devendersingh@chem.ufl.edu	jchakraborty@chem.ufl.edu
Phone:	(352) 392-0987	(352) 392-8417
Office hours:	by appointment (email to schedule)	

Required Text

There is no required text for this course

Reserve/Resource Texts (freely available through the UF library website portal)

ACS Style Guide; 3rd ed.; Coghill and Garson

Experimental Organic Chemistry; Mohrig, Hammond, Morrill and Neckers

Inorganic Chemistry; 5th ed.; Miessler and Tarr

Inorganic Experiments; 2nd ed.; Woollins

Synthesis and Technique in Inorganic Chemistry: A Laboratory Manual; 3rd ed.; Girolami, Rauchfuss, Angelici

Grades	Written Lab reports	40%
	Experimental Questions	30%
	Oral Lab Report	10%
	Lab notebook, technique, etc.	20%

Course grades will be assigned according to UF policy:

A: 100-93%; A⁻: 92-88%; B⁺: 87-83%; B: 82-78%; B⁻: 77-73%; C⁺: 72-68%; C: 67-63%; C⁻: 62-55%; D: 55-45%; E < 45%

<https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

Course Description

Students will perform experiments involving the synthesis, isolation, purification and characterization of a variety of inorganic compounds and report the findings in the format of an ACS style journal article. Characterization methods that will be employed include NMR spectroscopy, UV/Visible spectroscopy, IR (infrared) spectroscopy, and electrochemical methods. As the course progresses, concepts relating to main group chemistry, transition metal chemistry, materials, bioinorganic chemistry, organometallics and molecular orbital theory will be developed.

The main learning objectives for this course are:

1. Learn new synthetic techniques specific to inorganic chemistry
2. Learn common characterization techniques used in synthetic inorganic chemistry
3. Learn new aspects of inorganic molecular reactivity and bonding
4. Learn effective communication of scientific results, both written and oral

This course places more responsibility for the execution of experiments on you, the students. **You must read the entire protocol for a particular lab prior to that lab meeting.** Students will work in groups (usu. two per group) to conduct different experiments each week. The lab will be open during the scheduled times but it may be necessary to come in for some additional time to complete unfinished characterization. Access to additional time will be at the discretion of the TAs and the instructor and will not be permitted in cases where students have arrived unprepared for a lab exercise. Unprepared students will be asked to leave the lab until they are appropriate ready for that experiment. **Students are required to look up the MSDS sheets** for each reagent used to understand the hazards and precautions required. Should any accident occur, no matter how small, you are to report the incident to the TA or instructor immediately.

Lab Reports

Lab reports will be prepared in the style of an article written in *Journal of American Chemical Society*. Your reports should be properly referenced and organized. The following separate sections are required in your reports: Abstract, Introduction, Experimental, Results, Discussion, and Conclusion. You are encouraged to use the ACS style guide useful for preparing your lab reports. Reaction and mechanisms must be drawn using the Chemdraw software package and the TAs will help you to obtain other experimental data in electronic versions. The written lab reports and answers to questions are to be each student's individual effort with the understanding that collected data were the work of the group. Because few students have had experience writing reports in this format, the first report will be graded S/U (a grade of "U" will require the student to write an additional report). The general rubric by which these reports will be graded is provided with the course information. Lab reports are due as indicated by the calendar included in the course information. A letter grade will be deducted from the total grade for each late submission without exception.

Oral Exam

There will be one oral presentation near the end of the semester. Each student will be assigned an experiment. The student will deliver a 10-15 minute powerpoint presentation (5-10 slides), which will be followed by a 10-15 minute Q&A period on topics relating to the experiment, presentation or techniques, and then by a 5-minute period of feedback on the student's overall performance in the course.

Experiments

See lab manual

Materials and Supply Fees

\$50

Attendance and Absence Policy

Attendance will not be included in student assessment but is **strongly** advised as the in-class discussion may diverge from the text. Acceptable reasons for absence from class include illness*, serious family emergencies, special curricular requirements (e.g., judging trips, field trips, professional conferences), military obligation, severe weather conditions, religious holidays, court-imposed legal obligations (e.g., jury duty or subpoena), and participation in official university activities such as music performances, athletic competition, or debate.

*The university's policy on appropriate documentation of absence due to illness can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx> and

<http://shcc.ufl.edu/forms-records/excuse-notes/>

Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Academic Honesty

Students are required to be honest in their coursework. Any act of academic dishonesty will be reported to the Dean of Students, and may result in failure of the assignment in question and/or the course. For University of Florida's honor code, see <http://www.dso.ufl.edu/sccr/honorcodes/honorcode.php>.

Accommodations for Students with Disabilities

Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation. Contact the Disability Resources Center (<http://www.dso.ufl.edu/drc/>) for information about available resources for students with disabilities.

Counseling and Mental Health Resources

Campus Helping Resources Students experiencing crises or personal problems that interfere with their general wellbeing are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, www.counseling.ufl.edu/cwc/ Counseling Services Groups and Workshops Outreach and Consultation Self-Help Library Wellness Coaching
- U Matter We Care, www.umatter.ufl.edu/
- Career Resource Center, First Floor JWRU, 392-1601, www.crc.ufl.edu/

Student Complaints:

- Residential Course: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf

CHM3610L: Inorganic chemistry Laboratory

Spring 2019

Location: JHH110 or CLB419 (see below)

R: 2-5, F: 2-4

Instructors:

Jhonti Chakraborty (CLB 419)

Devender Singh (CLB 403)

Email:

jchakraborty@chem.ufl.edu devendersingh@chem.ufl.edu

Jan 10th R 2-4: Experiment I (Day 1). Coordination of BH_4 in bis(triphenylphosphine)Copper(I) Borohydride, $(\text{Ph}_3\text{P})_2\text{CuBH}_4$.

Jan 17th R 2-4: Experiment II (Day 1). Tetraiodotitanium(IV) and its Triphenylphosphine Complex (Section I).

Jan 18th F 2-3: Day 2 (Section II).

Jan 24th R 2-4: Experiment III (Day 1). Synthesis of Cobalt Coordination Isomeric Complexes (Section I).

Jan 25th F 2-3: Day 2 (Section II).

Jan 31st R 2-4: Experiment IV (Day 1): Synthesis of four metal complexes of acetylacetonate (Section I).

Feb 1st F 2-3: Section II (Day 2)

Feb 7th R 2-4: Experiment V (Day 1): Bioinorganic Chemistry: Copper(II) Tetraphenylporphyrinate (Section I).

Feb 8th F 2-3: Section II (Day 2)

Feb 14th R 2-4: **We will meet in CLB 419 for this experiment as it needs glovebox.**

Experiment VI (Day 1). NMR Investigation of Molecular Fluxionality: Synthesis of Allylpalladium Complexes (Section I).

Feb 15th F 2-3: Section II (Day 2)

Feb 21st R 2-4: Experiment VII (Day 1). Synthesis and Characterization of π -Complexes of Fe(II) (Section I).

Feb 22nd F 2-3: Section II (Day 2).

Feb 28th R 2-4: Experiment VIII: Synthesis of four metal complexes of acetylacetonate

(Section I)

Mar 1st F 2-3: Section II (Day 2)

Mar 14th W 2-4: Experiment IX (Day 1). Experiment IX: Metal-catalyzed Cyclic Polymer Synthesis

Lab Report Due Dates

Five lab reports are required for this course (4 written, 1 oral). Below are the dates that lab reports are due.

You may choose any experiment we have completed to write-up or present as your oral report. Please refer to the grading rubric and written report example in canvas for guidance when writing your reports.

Written report #1: January 24th, 2019

Written report #2: February 14th, 2019

Written report #3: February 28th, 2019

Written report #4: March 14th, 2019

Oral Reports will be presented in CLB 414 on April 4th, 2019.