Chem 004:153 — Inorganic Chemistry Laboratory — Fall 2011

Time & Location: 
Lecture: 2:00 p.m. – 2:50 p.m. T/Th in 106 GILH
Laboratory: 3:30 p.m. – 6:20 p.m. T/Th in E424 CB

Course Website: Access through http://icon.uiowa.edu (requires UI Hawk ID)

Instructor: Jan-Uwe Rohde
Room E357 CB, phone 335-2530, email chem-rohde@uiowa.edu

Office Hours: 2:30 – 4:00 p.m. W, 10:00 – 11:30 a.m. Th, and by appointment

Course Objectives
This course introduces students to a variety of synthetic methodologies for the preparation of molecular inorganic compounds and solid-state materials. Hands-on training will be provided on, for example, manipulation of air- and moisture-sensitive compounds under inert atmosphere, high-temperature solid-state synthesis, sol-gel synthesis, recrystallization, and glassblowing. Students will also apply various analytical and spectroscopic methods for the characterization of the prepared compounds such as UV-Vis, FTIR, and NMR spectroscopy, polarimetry, mass spectrometry, and X-ray diffractometry.

List of Laboratory Experiments
Experiment 1: Synthesis of \( [\text{Co(en)}_3]^{3+} \) and resolution of enantiomers
Experiment 2: Synthesis and derivatization of octahedral \( W_6\text{Cl}_{14}^{2-} \) clusters
Experiment 3: Synthesis of a high-temperature superconductor: \( \text{YBa}_2\text{Cu}_3\text{O}_7 \)
Experiment 4: Synthesis of organometallic molybdenum complexes under inert atmosphere
Experiment 5: Solid-state reactivity directed using coordination-driven self-assembly
Experiment 6: Introduction to scientific glassblowing

Detailed manuals can be downloaded from the course website.

Reference Materials
Books on laboratory methods and inorganic chemistry are available on either course reserve or permanent reserve in the Sciences Library:
• Laboratory Methods: Girolami, Rauchfuss, Angelici, Synthesis and Technique in Inorganic Chemistry: A Laboratory Manual; Komiya, Synthesis of Organometallic Compounds: A Practical Guide (available as electronic resource);

Safety in the Laboratory
• Students must complete laboratory safety training and pass a safety quiz before they will be allowed to work in the laboratory.
• Safety goggles and proper lab attire must be worn at all times.
• Comply with laboratory safety rules at all times and follow good laboratory practices with regards to hazardous waste disposal.
• Always be aware of your surroundings (a neighbor’s experiment, students carrying chemicals, etc.).
Coursework
The course has three components: lecture, laboratory, and exams. Some lectures will be shorter than 50 min, and the experimental instruction in the laboratory may then start before 3:30 p.m. On occasion, the laboratory session may be longer than scheduled (~ 30 min) in order to reach a good stopping point.

For each experiment, students will complete a pre-laboratory assignment and a laboratory report. The pre-laboratory assignment (including a procedural flowchart) is to be submitted prior to the beginning of a new experiment. While you perform work in the lab, you are required to record all experimental plans, procedures, and data in a bound composition book (lab protocol). Each experiment will require a formal laboratory report (about 8–10 pages) that includes a brief introduction to the subject area, an experimental section (with details of syntheses and characterization), description, interpretation and discussion of experimental results, and copies of all experimental data, spectra, and handwritten lab notebook pages. Due dates will be announced in class and posted on the course website. Detailed information about the format of the report will be provided in class.

Grading
Semester grades will be based on six pre-laboratory assignments, five laboratory reports, participation in lecture and laboratory, a midterm exam, and a final exam. Completion of each experiment and the two exams is required for a passing grade. The plus/minus grading will be used (http://www.clas.uiowa.edu/faculty/teaching/grading/).

- Pre-laboratory Assignments (PL) 60 points (7.5%)
- Laboratory Reports (LR) 500 points (62.5%)
- Participation 20 points (2.5%)
- Midterm Exam 100 points (12.5%)
- Final Exam 120 points (15.0%)
Total 800 points (100%)

Expectations
Attendance: Attendance and timely arrival are expected at all three components of the course (lectures, laboratory, and exams). Students should also expect to devote at least six hours per week to out-of-class preparation for this course (3 credits x 2 hours/credit). If a laboratory session or exam is missed, written documentation of the reason must be submitted. Only university recognized excuses will be accepted (e.g., illness, family emergency, certain university activities).

Laboratory responsibilities and independent work: Pre-lab assignments and lab reports must be independently produced. While some experiments will be performed in groups (2 or 4 students), each student must independently write up all experimental details for their laboratory reports and submit individual copies of data and calculations. All data analysis and interpretation must also reflect the independent thoughts of each student. General discussion of experimental concepts and procedures with other students is permitted.

College of Liberal Arts & Sciences Policies and Procedures
Administrative Home
The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Student Academic Handbook. www.clas.uiowa.edu/students/handbook/
Electronic Communication
University policy specifies that students are responsible for all official correspondences sent to their University of Iowa e-mail address (@uiowa.edu). Faculty and students should use this account for correspondences. (Operations Manual, III.15.2; www.uiowa.edu/~our/opmanual/iii/15.htm#152; scroll down to k.11.)

Accommodations for Disabilities
A student seeking academic accommodations should first register with Student Disability Services and then meet privately with the course instructor to make particular arrangements. See www.uiowa.edu/~sds/ for more information.

Academic Honesty
The College of Liberal Arts and Sciences expects all students to do their own work, as stated in the CLAS Code of Academic Honesty. Instructors fail any assignment that shows evidence of plagiarism or other forms of cheating, also reporting the student's name to the College. A student reported to the College for cheating is placed on disciplinary probation; a student reported twice is suspended or expelled. http://clas.uiowa.edu/students/handbook/academic-fraud-honor-code

CLAS Final Examination Policies
Final exams may be offered only during finals week. No exams of any kind are allowed during the last week of classes. Students should not ask their instructor to reschedule a final exam since the College does not permit rescheduling of a final exam once the semester has begun. Questions should be addressed to the Associate Dean for Undergraduate Programs and Curriculum.

Making a Suggestion or a Complaint
Students with a suggestion or complaint should first visit the instructor, then the course supervisor, and then the departmental DEO. Complaints must be made within six months of the incident. See the CLAS Student Academic Handbook. www.clas.uiowa.edu/students/handbook/x/#5

Understanding Sexual Harassment
Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI Comprehensive Guide on Sexual Harassment for assistance, definitions, and the full University policy. www.uiowa.edu/~eod/policies/sexual-harassment-guide/index.html

Reacting Safely to Severe Weather
In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. For more information on Hawk Alert and the siren warning system, visit the Public Safety web site. http://police.uiowa.edu/stay-informed/emergency-communication/

Student Classroom Behavior
The ability to learn is lessened when students engage in inappropriate classroom behavior, distracting others; such behaviors are a violation of the Code of Student Life. When disruptive activity occurs, a University instructor has the authority to determine classroom seating patterns and to request that a student exit immediately for the remainder of the period. One-day suspensions are reported to appropriate departmental, collegiate, and Student Services personnel (Office of the Vice President for Student Services and Dean of Students). http://dos.uiowa.edu/

Resources for Students:
• Writing Center, 110 English-Philosophy Building, www.uiowa.edu/~writingc/
• Speaking Center, 153 English-Philosophy Building, www.uiowa.edu/~rhetoric/centers/speaking
• Mathematics Tutorial Laboratory, 314 MacLean Hall, www.math.uiowa.edu/MathTutorialLab/
• Tutor Referral Service, Campus Information Center, Iowa Memorial Union, http://imu.uiowa.edu/cic/