Chem 004:153 — Inorganic Chemistry Laboratory — Fall 2010

Time & Location: Lecture: 1:30 p.m. – 2:20 p.m. T/Th in C129 PC
Laboratory: 2:30 p.m. – 5:20 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: 5:00 – 6:30 p.m. T, 3:00 – 4:30 p.m. W, 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 [Co(en)_3]^{3+} and resolution of enantiomers
Experiment 2: Synthesis and derivatization of octahedral W_6Cl_{14}^{2-} clusters
Experiment 3: Synthesis of a high-temperature superconductor: YBa_2Cu_3O_7
Experiment 4: Synthesis of organometallic molybdenum complexes under inert atmosphere
Experiment 5: Solid-state reactivity directed using coordination-driven self-assembly
Unit 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 course reserve or permanent reserve in the Library:

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 2:30 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 activity and a laboratory report. The pre-laboratory activity (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 detail 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, details of syntheses and characterization, 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 general format of the report will be provided in class.

Grading

Semester grades will be based on six pre-laboratory activities, five laboratory reports, participation in lecture and laboratory, a midterm exam, and a final exam. The plus/minus grading will be used (http://www.clas.uiowa.edu/faculty/teaching/grading/).

• Pre-laboratory Activities (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. 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 of the Course
The administrative home of this course is the College of Liberal Arts and Sciences, which governs academic matters relating to the course such as the add/drop deadlines, the second-grade-only option, issues concerning academic fraud or academic probation, and how credits are applied for various graduation requirements. Different colleges may have different policies. If you have questions about these or other CLAS policies, visit your academic advisor or 120 Schaeffer Hall and speak with the staff. The CLAS Academic Handbook also contains important CLAS academic policy: www.clas.uiowa.edu/students/academic_handbook/index.shtml

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. www.uiowa.edu/~our/opmanual/iii/15.htm#152; scroll down to k.11.

Accommodations for Disabilities
The University upholds actions of diversity and inclusion. A student seeking academic accommodations first must register with Student Disability Services (3100 Burge Hall, 335-1462, www.uiowa.edu/~sds/) and then meet with a counselor in that office who reviews documentation and determines eligibility for services. A student approved for accommodations should then go to the Chemistry Center, Room E225 CB, to arrange particular accommodations.

Academic Fraud
The University expects the highest level of integrity from its students. Plagiarism and any other activities that result in a student presenting work that is not his or her own are academic fraud. Academic fraud is reported to the departmental DEO and then to the Associate Dean for Academic Programs and Services who deals with academic fraud according to these guidelines: www.clas.uiowa.edu/students/academic_handbook/ix.shtml

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 have the right to make suggestions or complaints and should first visit with the instructor, then with the course supervisor if appropriate, and next with the departmental DEO. All complaints must be made as soon as possible and always within six months of the incident. www.clas.uiowa.edu/students/academic_handbook/ix.shtml#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
The University of Iowa Operations Manual section 16.14 outlines appropriate responses to a tornado or to a similar crisis (www.uiowa.edu/~our/opmanual/v/16.htm#1614). If a tornado or other severe weather is indicated by the UI outdoor warning system, members of the class should seek shelter in rooms and corridors in the innermost part of a building at the lowest level, staying clear of windows, corridors with windows, or large free-standing expanses such as auditoriums and cafeterias. The class will resume, if possible, after the UI outdoor warning system announces that the severe weather threat has ended (www.uiowa.edu/~pubsfty/siren.htm).
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). www.uiowa.edu/~vpss/policies/ii/a.shtml

Resources for Students:
• Writing Center, 110 English-Philosophy Building, 335-0188, www.uiowa.edu/~writingc
• Speaking Center, 12 English-Philosophy Building, 335-0205, www.uiowa.edu/~rhetoric/centers/speaking
• Mathematics Tutorial Laboratory, 314 MacLean Hall, 335-0810, www.uiowa.edu/mathlabTutor
• Tutor Referral Service, Campus Information Center, Iowa Memorial Union, 335-3055, www.imu.uiowa.edu/cic/tutor_referral_service