

CHEM 3121.001 – Inorganic Chemistry Lab
F, 1:00-5:00 pm, RBS Room 4007/4012
Spring 2009 Syllabus

Instructor

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Office Hours

M–F 9:00–10:00 am
or by appointment

Course Description: Students will learn a variety of practical techniques in the synthesis, characterization and handling of a variety of inorganic and organometallic compounds. Students will also learn about writing technical papers/reports that are of publishable quality.

Prerequisites: Successful completion of CHEM 1312 and CHEM 1112.

Corequisite: Credit for or concurrent enrollment in CHEM 3320.

Required materials: The lab manual *Synthesis and Technique in Inorganic Chemistry 3/E* by Girolami, Rauchfuss, and Angelici (ISBN-13: 9780935702484) is the required text. A lab notebook (need not be carbon-copy), pen, calculator, and appropriate lab attire (goggles, shoes, etc) are also required. A majority of the experiments will be taken from the laboratory manual, however some of the experiments will be provided to you as handouts.

Student Learning Outcomes

By the end of the course students should be able to:

- Handle laboratory glassware, equipment, and chemical reagents safely using general guidelines and basic knowledge about common hazards often encountered in a synthetic chemistry laboratory.
- Use instrumentation commonly found in a synthetic inorganic chemistry laboratory.
- Interpret laboratory results and data correctly within inherent limitations on precision and report findings in a scientific notebook using acceptable appropriate notational and descriptive content that is in turn understandable and reproducible.
- Apply procedures from literature sources to synthesize a given compound.
- Write scientific journals and reports which clearly present scientific data and which include lucid, logical conclusions based on the experimental data.

Grading: The grading scale will be based on the standard 90/80/70/60 (A/B/C/D) scale. You will be evaluated based on your lab work, notebook, and written reports. One of your experiments will be a “final project” which will require you to search the literature to find a procedure that will allow you to synthesize a compound assigned by the instructor.

- Lab performance (technique, yields, etc) – 20%
- Notebook (see below for specifics) – 30%
- Written reports (see below for specifics) – 50%

How to keep a good lab notebook:

- Have the Title/Date/Abstract and Experimental Procedure written ***BEFORE*** lab. (See below.)
- Use a blue or black ink pen to record your data! No pencils! If you need to make a correction to something, especially any data, draw a line through the mistake and initial it.
- At the end of the lab period, sign and date your data/observations and then I’ll sign/date it as well.
- Lab notebooks will be collected periodically during the semester for grading.

Lab notebook format:

- **Title/Date/Abstract:** Give a brief summary of what the lab is about.
- **Experimental Procedure:** Include all details related to conducting the experiment. Remember, notebooks are to be written so that someone months or even years later can reproduce your results.
- **Data/Observations:** Record all the measurements taken and observations made during the experiment. Label data and observations clearly to avoid confusion (both yours and mine).
- **Calculations:** Write out all your calculations (yes, grams, moles, percent yields, etc.) Be sure to label these accurately and clearly as well.

Report Format:

Look at full articles (not communications or corrections) from *Inorganic Chemistry* or the *Journal of the American Chemical Society* to get ideas for style and presentation.

- **Cover Page (Title/Date/Name/Abstract):** Two or three sentences, **briefly** describing your results.
- **Introduction:** Briefly discuss the principle(s) of the experiment and give pertinent chemical equations.
- **Procedure:** Cite the procedure from the lab manual or handout. You should also write out the entire synthesis and be sure to include any deviations or modifications to the procedure. Your procedure should also identify any instrumentation used (make and model), and how samples were prepared, and the conditions under which the samples were run.
- **Results/Discussion:** Break your results into the following categories (if applicable):
 - **Synthesis:** describe the reaction briefly (color changes, precipitates, yields, etc). Indicate any problems or interesting aspects of the synthesis.
 - **Characterization:** describe any type of spectroscopic results (IR, UV-vis, NMR, magnetic susceptibility, etc.); figures are nice. If possible you should try and assign features in your characterization (e.g. "the peak at 1.97 in the ^1H NMR is due to the methyl group of of some residual acetic acid in the sample). For comparing multiple compounds, use tables!
 - **Analysis:** show pertinent analytical data (i.e. titration curve) in table and/or graphical format. Indicate any equations you used in calculating an answer. If applicable compare with the known literature values (cite your references!) and note any differences. If these are significant then discuss why your results differ.
- **Conclusions:** any general comments regarding your results.
- **References:** in the main body of the report use superscripted numbers for the citations. Refer to <http://chemistry.library.wisc.edu/instruction/acstyle.htm> for information on how to format your bibliography. You can also consult *The ACS Style Guide: A Manual for Authors and Editors*, 3/E; if you do not have a copy, the library has two available (call number QD8.5 .A25 2006).

Provide me with a hard copy **and** an electronic copy (via email) of your report.

Report checklist:

- Cover page
- Introduction
- Procedure
- Results/Discussion
- Synthesis
- Characterization
- Analysis
- Conclusion
- References superscripted numbers to indicate the references and proper bibliographic formatting
- Hard copy to Dr Smee
- Electronic copy to Dr Smee

University Policies

Students Rights and Responsibilities

- To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please see this link: <http://www.uttyler.edu/wellness/StudentRightsandResponsibilities.html>

Grade Replacement/Forgiveness

- If you are repeating this course for a grade replacement, you must file an intent to receive grade forgiveness with the registrar by the 12th day of class. Failure to do so will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates will receive grade forgiveness (grade replacement) for only three course repeats; graduates, for two course repeats during his/her career at UT Tyler.

State-Mandated Course Drop Policy

- Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the 12th day of class (See Schedule of Classes for the specific date).
- Exceptions to the 6-drop rule include, but are not limited to, the following: totally withdrawing from the university; being administratively dropped from a course; dropping a course for a personal emergency; dropping a course for documented change of work schedule; or dropping a course for active duty service with the U.S. armed forces or Texas National Guard.
- Petitions for exemptions must be submitted to the Registrar's Office and must be accompanied by documentation of the extenuating circumstance. Please contact the Registrar's Office if you have any questions.

Disability Services

- In accordance with federal law, a student requesting accommodation must provide documentation of his/her disability to the Disability Support Services counselor. If you have a disability, including a learning disability, for which you request an accommodation, please contact Ida MacDonald in the Disability Support Services office in UC 282, or call (903) 566-7079.

Student Absence due to Religious Observance

- Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

Student Absence for University-Sponsored Events and Activities

- If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

Social Security and FERPA Statement:

- It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.