

**CHM 402**  
Physical Inorganic Laboratory  
Spring, 2023

Instructor: Dr. Bill Euler

TA: Maggie Mahaney, Beaupre 450

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Office hours: Tuesday & Thursday, 9 – 10 am; by appointment, whenever I am in my office

Course Goals: This laboratory focuses on the preparation and characterization of inorganic compounds with emphasis on transition metal complexes. This syllabus includes brief descriptions of the experiments that you will need to expand upon **prior** to coming to lab. Each student works individually and experiments are rotated to accommodate the equipment usage. **The handouts on Brightspace are not allowed in the laboratory.** You must bring a notebook to each lab period that contains the procedures used for your assigned experiment, including the details that may have been left out of the provided materials. The goal is to improve your skills as an independent chemist.

Experiments: Preparation and characterization of potassium trisoxalatochromate(III)  
Preparation of isomers of pentaamminenitrocobalt(II) chloride  
Preparation and characterization of acetylacetonates of Cr(III) and Mn(III)  
Photochemical preparation of enneacarbonyldiiron(0)  
Preparation and characterization of N,N'-bis(salicylaldehyde)-ethylenediimine zinc(II).

|          |   |            |
|----------|---|------------|
| Grading: | Report 1, $K_3[Cr(ox)_3] \cdot xH_2O$       | 100        |
|          | Report 2, $[Co(NH_3)_5(NO_2)]Cl_2$          | 100        |
|          | Report 3, $[Cr(acac)_3]$ and $[Mn(acac)_3]$ | 100        |
|          | Report 4, $[Zn(salen)]$                     | 100        |
|          | Report 5, $[Fe_2(CO)_9]$                    | <u>100</u> |
|          | TOTAL                                       | 500        |

Before each lab period the TA will check your lab notebook to ensure that you are adequately prepared for the day's lab. This check will be worth 25 % of the report associated with the report. **You will not be allowed to start the experiment until your preparation is deemed acceptable.** This includes complete details of the synthesis (i.e., amounts of reagents, order of mixing, type and size of the flask to use, isolation techniques, and **safety considerations**) or the preparations needed to make the required measurements.

How reports should be written is given as part of this syllabus.

## **Academic Honesty**

Students are expected to be honest in all academic work. A student's name on any written work, quiz or exam shall be regarded as assurance that the work is the result of the student's own independent thought and study. Work should be stated in the student's own words, properly attributed to its source. Students have an obligation to know how to quote, paraphrase, summarize, cite and reference the work of others with integrity. The following are examples of academic dishonesty.

- Using material, directly or paraphrasing, from published sources (print or electronic) without appropriate citation
- Claiming disproportionate credit for work not done independently
- Unauthorized possession or access to exams
- Unauthorized communication during exams
- Unauthorized use of another's work or preparing work for another student
- Taking an exam for another student
- Altering or attempting to alter grades
- The use of notes or electronic devices to gain an unauthorized advantage during exams
- Fabricating or falsifying facts, data or references
- Facilitating or aiding another's academic dishonesty
- Submitting the same paper for more than one course without prior approval from the instructors.

Any student with a documented disability is welcome to contact me as early in the semester as possible so that we may arrange reasonable accommodations. As part of this process, please be in touch with Disability Services for Students Office at 330 Memorial Union, 401-874-2098 (<http://www.uri.edu/disability/dss/>)

## Format for Reports

The reports should be written in the style of ACS journals, as described out below.

“Title – brief but descriptive”

Author’s name(s)  
Contact information  
e-mail contact

**Abstract** The abstract should be a brief overview of the key results, typically no more than 150 words. No abbreviations should be used unless they are defined.

**Introduction** This gives the purpose and relevance for the study being reported. For CHM 402, this should usually be no more than 1 or 2 paragraphs. This section is usually heavily cited to put the study into context of the literature.

**Experimental** This section gives all of the experimental details. This includes specific masses or volumes of reagents, purification methods, instrumentation used (including make and model), key settings on the instruments, and any unusual procedures used.

**Results** This is where the results of the experiments are given. The chemical reactions run, yields, the unprocessed data (i.e., spectra or thermograms as collected) should be reported in this section. All figures should be introduced in text (using full sentences) and each figure should have a caption that briefly describes the content of the figure.

**Discussion** Interpretation of results is done in this section. This might include structural conclusions or how the results support or refute a theory.

**Conclusion** This is a brief reiteration of the key results and how they fit into the goals of the study.

**References** These should be reported in the ACS style as end notes. Each reference should have its own number and citations to anything obtained from the literature must be included. At least one citation to a primary reference (meaning a journal, not a web page) is required for each report. Plagiarism of others’ ideas is an unforgivable practice.

### Grading of Reports

|                         |      |
|-------------------------|------|
| Prelab lab preparation: | 25 % |
| Title:                  | 5 %  |
| Abstract:               | 5 %  |
| Introduction:           | 5 %  |
| Experimental:           | 10 % |
| Results:                | 20 % |
| Discussion:             | 20 % |
| Conclusion:             | 5 %  |
| References:             | 5 %  |

Late reports will suffer a 5 % reduction for each day past the due date. COVID **documented** cases can be accepted late without penalty.