

**SUL ROSS STATE UNIVERSITY**  
**Syllabus for Inorganic Chemistry II: CHEM 3409:L01 (Fall 2018)**

Lab: Inorganic Chemistry 3409  
Lab Section: L01  
Room: WSB 305  
Time: R 2:00 to 4:50 pm

TA: Robert LeBlanc  
Email: rleb5169@sulross.edu  
Office: WSB 308  
Office Hours: TWR 10-12

***Required Laboratory Manual***

Inorganic Chemistry II Laboratory Manual

**OBJECTIVES**

***Student Learning Objectives (SLO):***

A student graduating with the ***chemistry major*** is expected to demonstrate that (s)he is able to do the following:

1. Organic Chemistry—Students will be able to draw organic molecular structures and explain organic reactions, stereochemistry, structural analysis and reactions in biological systems.
2. Inorganic Chemistry—The student will be able to demonstrate understanding of coordination chemistry, valence theory, elementary actions and advanced molecular theory.
3. Analytical Chemistry—The student will be able to demonstrate an understanding of theory of analytical chemistry and conduct analytical analysis, including data analysis and calibration, equilibrium chemistry, gravimetric analysis, titrimetric analysis, spectroscopic analysis, and electrochemical analysis.
4. Physical Chemistry—The student will be able to demonstrate an understanding of the application and theory of physical chemistry, including topics such as atomic structure, electrochemistry, surface chemistry, solid-state chemistry, and thermodynamics.

5. Research—The student will collect and analyze published chemical literature and undertake a chemistry research project.

***Core Objectives (CO):***

A. Critical Thinking Skills – Students will gain/improve their critical thinking ability by solving real life chemistry problems through inquiry, analysis, and evaluation of available information. Students will be tested on their critical thinking ability in exams and through lab experiments

B. Communication Skills – Students will have the opportunity to improve communication skills through oral discussion and writing reports (i.e. observation, explanation, and conclusion etc.) on the experiments done in the lab sessions.

C. Empirical and Quantitative Skills – students will use the mathematical skills needed to manipulate and analyze numerical data obtained through experimentation in order to form conclusions

D. Teamwork – students will use team-spirit and consider different points of view to work effectively while conducting experiments as a team working toward a shared purpose or goal

***Calculator:*** A scientific calculator is required for this course.

***Cell phones ARE NOT*** permitted for use in exams and should be turned off during laboratory time.

***Expectations:***

- Read over the experiment before lab
- Follow all safety procedures:
- Shorts, flip-flops, chewing gum and open-toed shoes are **NOT** allowed in lab. If you come to class without appropriate clothing, you will be asked to leave. **NO EXCEPTIONS!**

### ***Attendance:***

Coming to lab is mandatory. Be on time and SIGN IN at the beginning of the lab period. Plan to spend the entire period in lab. The TA may deduct points for students who arrive late or leave early.

**If you *miss 3 labs* or more you will receive an automatic F.**

### ***Assignments:***

#### ***Lab Manual Assignments:***

- Pre-Lab: Due at the beginning of the lab that the experiment will be performed
- Data Sheet: Due the lab period after the lab is done

### ***Written Assignments:***

- Pre-Lab Write Up: Due at the beginning of the lab that the experiment is performed
- Lab Report: Due the lab period after the lab is done
- Guidelines for writing lab reports are shown on the next page and are found in your General Chemistry II Laboratory Manual

### **Lab Grading:**

- Each experiment is worth 30 points
- These points will come from:
  - o The pre-lab definitions (5)
  - o Attendance (5)
  - o The experiment work & on time submission of data & result sheets/ written lab report (20)
  - o **Note:** Points will be deducted for not turning in lab reports and data/results sheets on time.
- Assignments must be completed and turned in on time
  - o Assignments must be legible
  - o Assignments and reports will be due the following week unless told otherwise
  - o 10% of the grade will be deducted for assignments not turned in at the beginning of lab. An additional 10% will be deducted for each day that the assignment is late

### **Outline for Written Pre-lab Reports**

- **Aim:** Here you will state the goal of the experiment (in your own words).
- **Reagents:** You will make a list of all of the chemicals used in the experiment along with relevant data (grams, volume, molarity etc. that is indicated in your experiment).
- **Apparatus:** You will list all of the equipment that you will use.
- **Method:** This is where you will outline the steps in the experiment. The steps will be put in your own words.

### Outline for Written Lab Reports (Use Microsoft Word or related program)

- **Aim:** Here you will state the goal of the experiment (in your own words).
- **Reagents:** You will make a list of all of the chemicals used in the experiment along with relevant data (grams, volume, molarity etc.). This is how much **YOU** used, not how much the manual asks for.
- **Apparatus:** You will list all of the equipment that you used.
- **Method:** This is where you will outline the steps in the experiment. Be sure to note any difference between what you did and what the manual said to do.
- **Data & Results:** Note the observations that you made during the

experiment. What are your findings? (percent yield, melting point, *etc.*)

- **Discussion:** Discuss your results and answer the questions that were asked in the **Data and Results** section of the experiment. Talk about the significance of your results. Were your results expected or unexpected? Why or why not?
- **Conclusion(s):** Summarize the key points and findings of the experiment. Was the experiment successful or unsuccessful?

***Students with Special Needs:*** *Sul Ross State University is committed to equal access in compliance with the Americans With Disabilities Act of 1973. It is the student's responsibility to initiate a request for accessibility services. Students seeking accessibility services must contact Mary Schwartz in Counseling and Accessibility Services, Ferguson Hall, Room 112. The mailing address is P.O. Box C-122, Sul Ross State University, Alpine, Texas 79832. Telephone: 432-837-8203. E-mail: mschwartz@sulross.edu.*

**Scholastic Dishonesty:** Students who violate the University rules on scholastic dishonesty are subject to penalties, including the possibility of an **F** in the course and/or dismissal from the University.

# Inorganic Chemistry 3409 Lab Schedule

<u>Date</u>	<u>EXPERIMENT</u>
August 30	No Laboratory Experiment
September 6	Exp 1: Safety Practices and Procedures (p 7)
September 13	Exp 2: Synthesis and characteristics of <i>tris</i> -triphenylphosphine 11 copper (I) nitrate (p.11)
September 20	Exp 3: Part A. Preparation of bis (N, N' disalicylaethylene- diamine)- $\mu$ -aquadicobalt (II) (p. 14)
September 27	Exp 3: Part B. Preparation of bis (N, N' disalicylaethylene- diamine)- $\mu$ -aquadicobalt (II) (p. 14)
October 4	Exp 4: Synthesis and characteristic of bis-pyridine iodine nitrate (p. 18)
October 11	Exp 5: Synthesis of penta amminechlorocobalt (III) chloride (p. 20)
October 18	Exp 6: Part A. Preparation of tetra butylammonium octamolybdate (VI) (p. 22)
October 25	Exp 6: Part B. Preparation of tetra butylammonium octamolybdate (VI) (p. 22)
November 1	Exp 7: Preparation of tris-acetylacetonato iron (III) (p. 25)
November 8	Exp 8: Preparation of potassium <i>bis</i> (peroxo)-oxo-(1, 10- phenanthroline) vsnsdium (V) trihydrate (p. 27)
November 15	Exp 9: Preparation of tetra-butylammoniumhexa molybdate (VI) (p. 30)
November 22	<b><i>No Laboratory Experiment (Thanksgiving)</i></b>
November 29	Lab Final and Clean Up