

SUL ROSS STATE UNIVERSITY
Syllabus for Inorganic Chemistry I Laboratory
CHEM 2402: L01 (Fall 2022) _11392

Inorganic Chemistry I: Lab 01
Room: WSB 305
Time: Th. 3:16-6:05 pm
Date: Aug.22 to Dec.7

TA: Dr. Hong Young Chang
Office: WSB 219
Email: hong.young.chang@sulross.edu
Office Hours: TBD

Required Laboratory Manual: Inorganic Chemistry II: Laboratory Manual (Handout) will be provided.

Safety glasses are required for Inorganic Chemistry Laboratories, which can be purchased from the SRSU Bookstore. You will NOT be allowed to participate in Inorganic Chemistry laboratories without safety glasses!

Laboratory coats are recommended for Inorganic Chemistry laboratories, which can be purchased from the SRSU Bookstore.

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.**

OBJECTIVES

Student Learning Objectives (SLO):

A student graduating with a ***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 an 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 the theory of analytical chemistry and conduct analytical analysis, including data analysis

and calibration, equilibrium chemistry, gravimetric analysis, titrimetric analysis, and 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.

BSc in Chemistry Marketable Skills

1. Students will become good at punctuality and time management.
2. Students will analyze &/or synthesize molecules and perform spectroscopic characterization and interpret their results scientifically.
3. Students will become proficient at writing scientific papers and identifying appropriate references for their papers.
4. Students will have become proficient at orally presenting scientific topics including the use of visual aids.

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, 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

Expectations:

- Read over the experiment before the lab
- Follow all safety procedures:

- Shorts, flip-flops, chewing gum and open-toed shoes are **NOT** allowed in the 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 where the experiment will be performed
- Data Sheet: Due to the lab period after the lab is done

Written Assignments:

- *Pre-Lab Write-Up*: Due at the beginning of the lab the experiment is performed
- *Lab Report*: Due to 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 & 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?

SRSU Disability Services: ADA (Americans with Disabilities Act)

Sul Ross State University (SRSU) is committed to equal access in compliance with Americans with Disabilities Act of 1973. It is SRSU policy to provide reasonable accommodations to students with documented disabilities. It is the student's responsibility to initiate a request each semester for each class. Students seeking accessibility/accommodations services must contact Rebecca Greathouse Wren, LPC-S, SRSU's Accessibility Services Coordinator at 432-837-8203 (please leave a message and we'll get back to you as soon as we can during working hours), or email rebecca.wren@sulross.edu. Their office is located on the first floor of Ferguson Hall (Room 112), and our mailing address is P.O. Box C-122, Sul Ross State University, Alpine, Texas, 79832.

Please inform Dr. Chang and your Chemistry TA, if you are pregnant or get pregnant during this semester as chemicals used in the chemistry laboratory, could have harmful effects on an unborn child and extra safety precautions and due diligence need to be taken into consideration during laboratory periods.

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 I Lab Schedule

<u>Date</u>	<u>EXPERIMENT</u>
August 25	<i>No Laboratory Experiment</i>
September 1	Safety Practices and Procedures in the Laboratory (Exp.1)
September 8	Synthesis Hexaamine Co(III) Chloride (Exp. 2)
September 15	Synthesis of trans-dichloro bis (ethylenediamine) cobalt (III) Chloride (Exp. 3)
September 22	Purification of Solids by Recrystallization (Exp. 4)
September 29	Infrared (IR) spectroscopy (Exp. 5)
October 6	Powder X-ray Diffractometer for solid samples (Exp. 6)
October 13	Simultaneous determination of chromium and manganese in a solution by visible spectroscopy (Exp. 7)
October 20	Determination of the extent of distortion for Octahedral Oxides (Exp. 8)
October 27	Lab Clean-Up and Final