

CHM-360 Inorganic Chemistry

Spring 2018 Syllabus

Professor Rupal Gupta

6S-214 x3936

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Description

- Introduction to atomic structure, bonding and reactivity of inorganic compounds, acid-base behavior, redox potentials, oxidation and reduction in chemical reactions.
- Molecular orbital theory.
- Physical properties of inorganic compounds and their implications towards real life applications.

Tentative Schedule

Unit 1 (~2 lectures): Atomic Structure

Unit 2 (~ 2 lectures): Periodic Table and Covalent Bonding

Unit 3 (~ 6 lectures): Bonding and Symmetry

Unit 4 (~4 lectures): Transition metals and crystal field theory

Unit 5 (~ 2 lectures): Metallic and Inorganic Bonding

Unit 6 (~ 2 lectures): Acids and Bases

Unit 7 (~ 2 lectures): Oxidation and Reduction

Unit 8 (~ 2 lectures): Trends in periodic table

Unit 9 (1 lecture): Group 1-2 elements

Unit 10 (1 lecture): Group 13-15 elements

Grading (100 points)

Class Participation: 5 points

Midterm 2: 12.5 points

Quizzes: 10 points

Midterm 1: 12.5 points

Lab Grade: 25 points

Final Exam: 35 points

Course hours: Lectures: M 12:20-2:15 pm, W 12:20-1:10 pm, 3N-214

Office hours: Please email me to schedule an appointment or talk to me after the class.

Text Books

Primary:

Inorganic Chemistry, 7th Edition; Mark Weller, Tina Overton and Jonathan Rourke. ISBN-10: 0198768125

Supplementary:

- Descriptive Inorganic Chemistry, 5th Edition by Geoff Rayner-Cahan and Tine Overon
- *Inorganic Chemistry*, Gary L Miessler, Paul J. Fischer and Donald Tarr, 5th Ed, Pearson – Prentice Hall (2013)

Quizzes and Exams: Tentative Midterm dates: March 5th and April 16th, Final: TBD

Makeup quizzes and exams will NOT be provided. There will be about (un)announced 10-12 quizzes during the semester.

Class Policies: Please familiarize yourself with CSI-CUNY policies on academic integrity. **Cheating and plagiarism will not be tolerated under any circumstances and will result in harsh consequences.** According to CSI's Spring 2019 Academic Calendar, the last day to withdraw with the grade of "W" without permission of an instructor or Chairperson is April 1, 2019. From April 2, 2019 to May 6, 2019, withdrawal from a chemistry course is possible, with the permission given under the discretion of the instructor and the Chairperson. The Chemistry Department policy does not permit the withdrawal from a chemistry course after May 6, 2019.

CHM360: Inorganic Chemistry Laboratory
College of Staten Island, Department of Chemistry
Spring 2019 Syllabus

Instructors

- Laurance Beaton
 - Office: 6S-216, email: Laurance.Beaton@csi.cuny.edu
 - Office Hours: By Appointment

Chief Lab Technicians

- Qi Li, email: Qi.Li@csi.cuny.edu
- Tai Park, email: Tai.Park@csi.cuny.edu

Class Section / Hours / Location

Section 20215 (LAB) / Tuesday 10:10am – 1:10pm / 6S-249

Text

Laboratory Manual will be distributed electronically, or printouts will be provided during the first lab session.

Course Objectives

- To improve your skills in the handling of chemical reagents.
- To apply principles learned in Inorganic Chemistry lectures.

PREPARATION

Read the experiment before you come to class. Preparing an outline of the experimental procedures prior to the lab is required before you walk through the door. THIS ALSO MEANS THAT YOU MUST KNOW THE STOCK CONCENTRATIONS/MOLAR MASS/ETC. OF WHAT YOU WILL BE USING. You may need to visit the station you will be attending the next week to write down this information from the reagent bottles. Be prepared to be verbally quizzed by your instructor about the experiment you are about to perform. Failure to complete any of these tasks will result in dismissal from the current week's lab period. If you are dismissed from the lab, you can come the following week to finish as much of the experiment as you can.

Lab Reports

Each lab report should be in the format of JACS Communication format. This format has a 3-page limit and can be downloaded from JACS website. ***Any lab report exceeding the 3-page limit and not following the JACS Communication format will receive a penalty.*** Students must familiarize themselves with the format on their own and the instructors will not be going over this in the lab.

Each lab report, unless otherwise stated should have the following sections: (i) A concise introduction (1 paragraph long); (ii) Experimental Procedure; (iii) Experimental Data (tabular format, with proper units); (iv) Results & Conclusions. Include any graphs, charts, and spectra from the experiment; (vi) References; (vii) Appendix. Post lab questions should be included at the end of the lab report. In the Appendix, show the calculations used in obtaining intermediate and final results, including any equations used in proceeding from data to results. In case of duplicate, triplicate, or other multiple sets of data, only one set of calculations need be shown, but all results should be listed in tabular form. When averaging or data-fitting is called for, a standard deviation should be listed as well as a mean. Answers to any specific questions asked within the experiment are typically incorporated into the applicable sections of the lab report, though it is very helpful to the instructors to include a section in the Appendix stating where the answers to the questions can be found.

The lab reports will be collected at the beginning of the lab section. The pre-lab questions will be collected at the beginning of a given lab section.

The lab reports should be typed, but the Appendix section describing the calculations can be hand-written.

The grading scheme will be based on the following three categories (with approximate weightage):

Presentation (10%): Is your overall report professional and aesthetically pleasing? Did you label your figures appropriately?

Writing (20%): Did you use correct grammar, and is your report readable? Did you describe the experiment appropriately in the Introduction section?

Experimental Description (20%): Was the procedure described properly? Note: Using the exact language provided in the lab manual will result in a penalty. You need to describe, in your own words, the procedure followed to conduct an experiment.

Results (30%): Is your data analyzed correctly? Did you use proper units? Did you tabulate all your data points? Are the figures referenced in the text? Did you present all the figures to justify your analysis?

Appendix, References (if any used) and Post lab questions (20%)

General Policies:

- 1) The use of cell phones in the lab is strictly prohibited, unless allowed by the instructor. If a student is found using his/her cell phone, they will be immediately asked to leave the lab and they will lose credits for that given lab.
- 2) Due date for each lab report submission will be disclosed at the beginning of each experiment. No late submissions will be accepted. There is **no exception to this policy.**
- 3) **Finally, plagiarism is taken extremely seriously in this course. If a student is caught cheating, copying any part of the lab report from any source, including previous years or fellow classmates, they will be immediately given an F-grade.**
- 4) Goggles and gloves should be worn at all times throughout the experiment unless the instructor gives the permission to take them off. Students not adhering to this policy will be immediately asked to leave the lab and they will lose credits for that lab.
- 5) Any hazardous waste should be disposed of in the specific container as advised by the instructor. All points for the given experiments will be deducted if a student fails to dispose of their waste properly.

Equipment and Lab Usage:

You MUST clean up after your experiment. The area around balance and stock solution should be kept neat and clean. **If you are found practicing uncleanly practices, you will be penalized.** NEVER put spatulas, glass pipets or anything else into any community reagent vessel. NEVER put any excess reagents back into these vessels. Take only what you need. Instruments are sensitive and expensive. Treat them accordingly.

Course withdrawal policy: "According to CSI's Spring 2019 Academic Calendar, the last day to withdraw with the grade of "W" without permission of an instructor or Chairperson is April 1, 2019. From April 2, 2019 to May 6, 2019, withdrawal from a chemistry course is possible, with the permission given under the discretion of the instructor and the Chairperson. The Chemistry Department policy does not permit the withdrawal from a chemistry course after May 6, 2019."

CHM 360 (Section: 20215) – Spring 2019 Lab Schedule

Date	EXPERIMENT	
(1) 01/29	Check-in; Safety Orientation; Lab Procedures	
(2) 02/05	Synthesis of $[\text{Co}(\text{NH}_3)_5\text{L}]\text{Cl}_2$ <i>Step 1, Step 2, Step 3: Synthesis of $[\text{Co}(\text{NH}_3)_5\text{ONO}]\text{Cl}_2$</i>	
(*) 02/12	*No class scheduled*	
(3) 02/19	Synthesis of $[\text{Co}(\text{NH}_3)_5\text{L}]\text{Cl}_2$ <i>Step 4: Synthesis of $[\text{Co}(\text{NH}_3)_5\text{NO}_2]\text{Cl}_2$; Step 5: $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$</i>	
(4) 02/26	Synthesis of $[\text{Co}(\text{NH}_3)_5\text{L}]\text{Cl}_2$ <i>Characterization of $[\text{Co}(\text{NH}_3)_5\text{NO}_2]\text{Cl}_2$ and $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$</i>	
(5) 03/05	Synthesis of Cis & Trans Isomers of $[\text{Co}(\text{en})_2\text{Cl}_2]\text{Cl}$ <i>Synthesis</i>	
(6) 03/12	Synthesis of Cis & Trans Isomers of $[\text{Co}(\text{en})_2\text{Cl}_2]\text{Cl}$ <i>Characterization by UV</i>	
(7) 03/19	Kinetics: Decomposition of $\text{Fe}(\text{phen})_3^{2+}$	
(8) 03/26	Synthesis of Silica Gel By Sol-gel Method (week 1/2)	
(9) 04/02	Synthesis of Silica Gel By Sol-gel Method (week 2/2)	
(10) 04/09	Noble Gases	
(11) 04/16	Cobalt Complexes (Week 1/2)	
(*) 04/23	*No class scheduled*	
(12) 04/30	Cobalt Complexes (week 2/2)	
(13) 05/07	Paper Presentation	
(14) 05/14	Check out	
*02/12, 04/23: No classes scheduled		