

CHEM 619/719 – Special Topic Inorganic Chemistry
Spring 2018

Prerequisites: Good standing in chemistry graduate program (719), minimum of a C in 322/333.

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Office Hours: Email to schedule an appointment

Website: <http://www.vrg-uofsc.com/Teaching.html> Grades on Blackboard: <https://blackboard.sc.edu>.

Required Materials: All reading/teaching materials will be supplied.

Lecture: M W 9:30– 10:50 Jones 115

Attendance is essential for earning a good grade. Important information and changes in the class schedule will be presented in lecture. Students are responsible for getting notes and information from any missed lectures. The lecture schedule and copies of the slides can be found at

<http://www.vrg-uofsc.com/Teaching.html>

Attendance is required and will be taken every day. Attendance of all class meetings is expected. Students are expected to attend each scheduled class meeting, to be on time, and to be prepared for each class session. The University attendance policy specifies that students may miss up to 3 class meetings (10% of class time) without penalty. The 4th absence will result in a grade penalty of one letter grade. The 5th absence will result in a deduction of 2 letter grades. Homework cannot be made up, nor the deadline extended. Note: Students using cell phones or other electronic devices during class will be marked absent for the day. Absent mind, absent student.

Midterm Exams: There will be three midterm exams:

Exam I: Wednesday, 2/21
Exam II: Monday, 4/2
Final: Monday, 4/23 (for 619 only)

Each exam will cover the topics of the previous weeks between the exams. Exams will encompass topics covered in class and understanding that should be obtained from assigned readings.

All notes, books, programs or other prepared materials may not be used during the test. Calculators may not be shared. All other electronics, including cell phones, must be inaccessible and out of view. Visible electronics are presumed to be in use and will be penalized accordingly.

Final Exam: For 719 only. The final exam will be a written report meant to emulate a research report that is publishable in an American Chemical Society Journal. The data for the report will be presented in class. The final exam will be **due on April 30th**. More details will be given in class.

Course Grade:	Score calculation	Approximate grading scale
	Exam I: 100 pts	A >400 pts
	Exam II: 100 pts	B+ 380–399 pts
	Attendance/Homework: 50 pts	B 350–379 pts
	Final Exam: 200 pts	C+ 330–349 pts
		C 300–329 pts
		D+ 280–299 pts
		D 250–279 pts
		F <249 pts

The grading scale may be adjusted based on overall class performance.

Following exams, approximate letter grades may be discussed. However, final grades will be assigned on the basis of point totals.

All required elements of the course are to be completed within the normal term. Failure to complete all the elements on time will result in a grade of F. Incompletes will only be assigned in unusual circumstances.

Hazardous Weather: If the University of South Carolina is closed for reasons stated in policy HR 1.18, students will be excused from class. Exams may be moved to new class times. All schedule changes will be posted on Blackboard.

Disabilities: Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, contact the Office of Student Disability Services: 777-6142, TDD 777-6744, email sasds@mailbox.sc.edu, or stop by LeConte College Room 112A. All accommodations must be approved through the Office of Student Disability Services.

Academic Dishonesty: Cheating, plagiarism, copying from old reports, and other forms of academic dishonesty in connection with any portion of this course will normally result in failure of the course. Cooperating in academic dishonesty will also result in failure. All incidents of academic dishonesty will be reported to the student's College for possible further disciplinary action.

Cell Phones, etc.: Please turn off cell phones (not just silent) during lecture. Texting, web surfing and other activities not related to the class are not allowed during the lecture. During tests, electronics other than calculators must be out of sight and inaccessible.

Copyright: All materials from this class are copyrighted. They may not be publically posted or transferred to third parties. Please contact the instructor if you wish to record the lectures.

Topics: Molecular inorganic catalysis. Electrochemical techniques. Electrocatalysis. Photocatalysis.

Learning Outcomes:

After completing CHEM 619/719, students will be able to:

- Critically analyze literature pertinent to their research.
- Be able to utilize basic electrochemical techniques.
- Understand how light interacts with inorganic and organometallic molecules based on energy level diagrams.
- Design experiments to develop and support proposed catalytic mechanisms.

Course Schedule

January 16th – February 20th: Organometallic chemistry: 18 electron rule, introduction to common ligands and ligand binding, reaction classes such as oxidative addition, substitution, solvolysis, migration, and reductive elimination. These topics will be presented in the context of the classic catalytic mechanism of Wilkinson's Catalyst.

February 26th – March 28th: Photophysics and Electrochemistry: How light interacts with inorganic and organometallic molecules, crystal field splitting theory, UV-Visible spectroscopy. An introduction to basic electrochemical experimental setups, electrochemical techniques such as voltammetry and electrolysis, concepts such as overpotential and diffusional processes and how these processes pertain to catalysis.

April 4th – April 18th: How to perform a mechanistic study using a given in class example catalyst and reaction. How to write a scientific paper will also be discussed. The information and data given during this section of class will be covered on the final exam (619) or final report (719).