CHEM 372 – Advanced Lab: Inorganic – Spring 2017

W 13:10 – 16:00

Instructor: Vivian Ezeh (Tomsich Hall 314, ezehv@kenyon.edu, 17404275355)

Office hours: Mon & Tues 11 am – noon, Wed & Thurs 4 – 5 pm or by appointment

Experimental Inorganic Chemistry is a collection of interesting research topics/questions. The field can be divided into solid-state, material, bio-inorganic, organometallic, main-group, nuclear chemistry etc. In CHEM 372, we will learn/explore synthetic methods of nanoparticles, TM coordination chemistry & organometallic chemistry. We will also learn characterization techniques such as UV-vis, FTIR, Cyclic voltammetry, paramagnetic/diamagnetic NMR, magnetism.

Course requirements:

Inorganic Chemistry Textbooks: Recommended texts to refresh your inorganic chemistry and analytical techniques. 1) Geoff Rayner-Canham & Tina Overton "Descriptive Inorganic Chemistry" 6th ed (CHEM243 text). 2) Housecroft & Sharpe "Inorganic Chemistry" 4th ed (QD151.3.H69 2001). 3) Skoog, Holler & Crouch "Principles of Instrumental Analysis" 5th ed (A department copy is available).

Moodle: Visit the class Moodle site often as various resources will be available on this platform. Links for submitting pre-lab and lab reports can also be found here.

P-drive: All your data will be transferred to the P-drive for storage & access (\\potomac.kenyon.edu\public → Class → Chemistry → CHEM372).

Peer collaborator: Choose a peer for each new synthesis experiment (A different colleague each time). While you are responsible for all synthesis and data, your peer collaborator is someone to strategize with, can give you feedback on your report and if necessary can collaborate on obtaining measurements.

File naming: Choose a good naming convention for all measurements that you will make. For example: an IR spectrum is labelled "VCEIR1" – the name consist of my initials, the type of technique & 1: the first IR measurement.

Programs: Obtain or update the following programs: ChemDraw (for drawing chemical structures), Scifinder (for literature search), Refworks (for formatting references).

Assessment: Final grade for the class will be based upon completing all experiments, submitting all assignments, preparing for each lab and participation exercises. Point distribution can be found in the following table. Letter grade at the end of the semester will be assigned using the following scale. The instructor reserves the right to assign whatever final grade is deemed appropriate.
Grade scale: 100 – 94 % (A +/-), 93 – 80 % (B +/-), 79 – 70 % (C +/-), 69 – 50 % (D +/-) & < 50 % (F).

Notebook & safety	5 %	Prelab & conference	5 %
Technique summary	10 %	Creativity celebration	5 %
Lab reports	60 %	Final exam	15 %

This syllabus is subject to change. Any changes will be communicated either verbally in class or via email.

Technique summary: A poster or article that summarizes the techniques will be submitted on Feb 8th at 11:59 pm by sharing on Google drive. The six techniques are: UV-vis, FTIR, Cyclic voltammetry, magnetic susceptibility (Evans balance), magnetic susceptibility (Evans method), NMR (diamagnetic & paramagnetic sample). Included in your report are: A brief summary of the technique; the information you can get from the technique; plot, label and annotate the data from your measurement; discuss the data you obtained and document all questions that you have.

Notebook: Record all measurements, observations, file names etc. in your notebook/journal as you perform the experiment. I will check your notes after each lab and will look for measurements, observations and data measurement names.

Safety: Perform experiments in a safe manner. Evaluation of safety will include: use of goggles (2 points), appropriate attire (2 points), gloves during synthesis (2 points), clean up (2 points), and use of secondary containers when travelling between labs (2 points) per lab section.

Lab report: There are three lab reports: a Google slide presentation for synthesis 1 and an article for synthesis 3 & 4. The report will consist of abstract (article), introduction, results, discussion, data plots, conclusion and references (ACS format). Submission of Google slide will be by sharing with me and the articles will be submitted to TurnItIn at 11:59 pm on the listed days.

Pre-lab and Conference: A plan (procedure, safety, glassware) for each synthesis experiment should be submitted to Google Drive by Mon before the experiment begins (**02/13**, **02/28**, **04/10**) at noon. On the following Tues and Wed (before noon) make an appointment (in office or electronic) to discuss the upcoming experiment.

Creativity celebration: Lit survey: choose a TM or a small molecule (NO, CO, CO_2, O_2), search the common inorganic journal (Inorganic Chemistry, Coordination Chemistry, European Journal of Inorganic Chemistry) for relevant articles. Paste a screenshot of the articles title to a Google doc that I will prepare (**02/22**, **03/29** & **04/26**). Chempics: submit a picture to cen.chempics.org. You can suggest and discuss any creative work related to IC that you are interested in.

Final exam: A final exam will take place in **May 8th 2017** at 6:30 pm. The exam can only be rescheduled with the permission of the Associate Provost, plan accordingly.

Locations:

Activity	Room
Synthesis	TOM 001 & 105
Storage of compounds and glassware, sample prep	TOM 001
NMR	TOM 001
UV-vis	TOM 001, 109, 309
FTIR	TOM 109, 209
CV	TOM 311
Optical microscope	Prof Garcia's lab
Meeting and workshop	TOM 206

Tentative Schedule

Dates	Topic/event
01/18	Introduction, syllabus, planning, Tech = FTIR, UV-vis
01/25	Technique play = CV, Evans balance
02/01	Techniques play = NMR (^{1}H) diamagnetic & paramagnetic, Evans method
02/08	Workshop on techniques, **Technique summary (Google slide / doc) due**
02/15	Copper nanoparticles (optical microscope)
02/22	Copper nanoparticles
03/01	Cobalt cage (^{13}C NMR), **Cu nanoparticle Google slide due**
03/08 & 03/15	Spring break
03/22	Cobalt cage
03/29	Cobalt cage
04/05	Cobalt cage, **article due**
04/12	Ferrocene (^{31}P NMR)
04/19	Ferrocene
04/26	Ferrocene
05/03	Ferrocene, **article due**
05/08	Exam

Important class policies:

Attendance: Attendance at all class meeting is expected. If you will be absent, discuss with me about making up your work. To be considered for extension on academic work, a notice from the Dean will be required.

Academic accommodation: Students who anticipate they may need accommodation in this course because of the impact of a learning, physical or psychological disability are encouraged to contact Erin Salva (salvae@kenyon.edu, 740-427-5453), Director of Student Accessibility and Support Services. Early contact will help avoid unnecessary inconvenience and delays.

Academic Honesty: All work turned in for credit must adhere to the principles of academic integrity (see Academic Honesty and Questions of Plagiarism in the Course Catalog). Copying colleague's texts, not citing source materials are examples of incidences that could potentially violate academic integrity. Potential violations will be forwarded to the Academic Infractions Board for adjudication, as is required by University policy. If the ethical implication of any situation is not clear, do ask me for clarification.

Bias/Discrimination/Harassment: Kenyon College seeks to provide an environment that is free of bias, discrimination, and harassment. If you have been the victim of sexual harassment/ misconduct /assault we encourage you to report this. If you report this to a faculty member, she or he must notify our college's Title IX coordinator about the basic facts of the incident (you may choose whether you or anyone involved is identified by name). For more information about your options at Kenyon, please go to: http://www.kenyon.edu/directories/offices-services/title-ix/sexual-assault-and-harassment/