

Chemistry 341

Spring 2016

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| Course: Chemistry 341 | Instructor: Prof. Jacob Ciszek |
| Date: Wednesday & Friday | Flanner Hall 122 |
| Time: 9:20A-12:20P | Phone: (773) 508-3107 |
| Location: Flanner Hall 204 | E-mail: jciszek@luc.edu |
| Textbook: 1) Szafran, Pike, & Singh <u>Microscale Inorganic Chemistry: A Comprehensive Laboratory</u> (1991) | Website: Sakai |
| 2) A bound laboratory notebook | |

Course Title: Advanced Inorganic Laboratory

Course Philosophy: Chemistry 341 is designed to be your final preparative lab before starting a career in chemistry. Thus, the course finishes your undergraduate education in chemistry by demonstrating many modern techniques and illustrating principles learned in your inorganic course (Chemistry 340). In addition, the course seeks to prepare you for entry into the laboratory environment, be it academic or industrial. As such, an emphasis will be placed on your preparation of a quality notebook and final reports in addition to your successful completion of the experiments.

Office Hours: Both your TA (Jonathan Hopwood) and I are available to assist you with questions you may have. We will hold office hours at the following times:

Jacob Ciszek

Wednesday 1:00-2:30 P

Friday 1:00-2:30 P

Jonathan Hopwood

Tuesday 4:00-5:00 P

Thursday 4:00-5:00P

Academic Honesty & Discipline: Honesty is the foundation of the academic system and hence is of the utmost importance. All lab reports should be exclusively your own work and no outside assistance is allowed. In addition, lab reports will be submitted through “turnitin” which automatically checks your text for similarities to content available on the web. In the unfortunate event that a student is caught cheating (plagiarism or other), 100 points will be deducted from your total grade and you will be brought to the attention of the Department Chair and Dean of the College who will determine if further action should be taken.

Grading: Your grade is determined primarily by your written reports with a minor portion resulting from other aspects (notebooks, safety, etc.). The breakdown can be seen below.

Grading Scale:

| | | | |
|-------------------------|-------------|-----------|---------|
| Lab Reports and Results | 7 × 100 pts | 700 | A > 88% |
| Notebooks | 5 × 10 pts | 50 | B > 78% |
| Quiz | 40 pts | 40 | C > 68% |
| Safety | 25 pts | 25 | D > 58% |
| Lab Report 1 Debrief | 15 pts | 15 | |
| Cleanup and Checkout | 15 pts | <u>15</u> | |
| Total | | 845 | |

Lab Reports – These formal reports are to be turned in by **8:15A** on the dates listed on schedule on the next page. Details of the lab report requirements can be found both in the text (p34-35) and in an additional handout given out the first day of class.

Notebooks – Notebooks are collected at the end of the class period listed in the schedule below. They will be graded for completeness/accuracy (4 pts), format (3 pts), and neatness (3 pts).

Completeness includes your prelab which is checked at the start of the lab. When evaluating neatness, two random sentences will be chosen from your notebook. If every letter of that sentence is not clear, points will be deducted. Your notebook should follow the rules outlined in Szafran, Pike and Singh (p31-34).

Safety – Lab safety is paramount. It is important to me and it will be important to your future bosses. Hopefully it is important to you. Any time you are in the lab you should be wearing lab glasses or goggles. Good chemical hygiene should be employed. At no time should you be touching chemicals without gloves. At no time should gloves (dirty or not!) be touching anything outside the lab or your cell phone! Cell phone use is not allowed in lab though you may leave the lab if it is urgent. Computers should be segregated from experiments. Other unsafe practices are not allowed. 5 points are deducted per instance.

Cleanup – For one or two class periods this semester (schedule on next page), you are responsible for ensuring that the laboratory benches and common areas are clean and encouraging your classmates to cleanup after themselves. Drawers must also be kept clean.

Pluses and minuses are not indicated in the grading scale but will be given. This will be done according to the natural breakdown of the grade distributions. Expect this to be the closest 1-2% to the final A-B, B-C, and C-D divisions.

Approximate schedule (including assigned reading):

| | | | | |
|------|--|----|----------------|----------------------|
| 1/20 | No lab | - | | |
| 1/22 | Notebook & Safety, Check-in, | 1 | Handouts, 1-47 | |
| 1/27 | Lab #42 part A: Synthesis of Metal Carbonyls | 2 | 313-316 | |
| 1/29 | IR Spectra, Report drafting | 3 | | |
| 2/2 | | - | | Report 1 due |
| 2/3 | Lab Report 1 Debrief/Setup Lab 26 | 4 | | |
| 2/5 | Lab #26: <i>trans</i> -[Co(en) ₂ Cl ₂]Cl | 5 | 239-242 | NB due |
| 2/10 | <i>cis</i> -[Co(en) ₂ Cl ₂]Cl, practice literature search | 6 | 242-243 | |
| 2/12 | Visible Spectroscopy/Raman | 7 | 107-13, 114-25 | |
| 2/17 | Lab #22: Cr(acac) ₃ | 8 | 224-227 | Report 2 due |
| 2/19 | Mn(acac) ₃ | 9 | 227-229 | |
| 2/24 | Magnetic Susceptibility | 10 | 49-56 | NB due |
| 2/26 | Melting Point/Infrared Spectroscopy | 11 | 74-80 | |
| 3/2 | Lab #29: Crystal Field Splitting | 12 | 248-252 | Report 3 due |
| 3/4 | UV-Visible Spectra | 13 | | NB due |
| 3/16 | Make-up Laboratory | - | | |
| 3/18 | Lab #34 part A: Wilkinson's Catalyst | 14 | | Report 4 due |
| 3/23 | IR & ¹ H NMR Spectra | 15 | 271-277 | |
| 3/30 | NMR: Styrene Hydrosilylation Kinetics | 16 | Handout | NB due |
| 4/1 | NMR: Kinetics, Product Analysis | 17 | | |
| 4/6 | Lab X–Au Nanoparticle Synthesis (sakai) | 18 | Handout | Report 5 due |
| 4/8 | Plasmons (UV-Vis), sizing (TEM) | 19 | Handout | |
| 4/13 | Lab Y-Generation of ZnO Nanoparticles (sakai) | 20 | Handout | Report 6 due |
| 4/15 | Photoluminescence, LED fabrication | 21 | Handout | |
| 4/20 | Make-up Laboratory | - | | |
| 4/22 | Make-up Laboratory | - | | |
| 4/27 | Check-out | 22 | | Report 7 due, NB due |
| 4/29 | Lab Quiz/Lab Feedback – FH 129 | 23 | | |

| | Last Name | First Name | Cleanup Days | | Lab Drawer |
|----|----------------|------------|--------------|------|------------|
| 1. | Brachfeld | Hannah | 1/27 | 1/29 | 1 & 2 |
| 2. | Calteaux | Victoria | 2/5 | 4/15 | 3 & 4 |
| 3. | Gawron | Donna | 2/10 | 2/12 | 5 & 6 |
| 4. | Hejnar-Escutia | Anna | 2/17 | 2/24 | 7 & 8 |
| 5. | Lovato | Kaitlyn | 2/19 | 2/26 | 9 & 10 |
| 6. | Nadel | Arnold | 3/2 | 3/4 | 11 & 12 |
| 7. | Pena | Andres | 3/18 | 3/23 | 13 & 14 |
| 8. | Sanchez Gomez | Eric | 3/30 | 4/6 | 15 & 16 |
| 9. | Turano | Marie | 4/8 | 4/13 | 17 & 18 |