

SYLLABUS

Chemistry Major Laboratory III (CH353)

Course Information

- 1) Lecture: Experiment: Credit = 0: 6h: 2
- 2) Location: **Lab 502 & 506 (E6-5)** Instructors:
- 3) Time Table

Time	Wed			Thu		
13:00 ~19:00	A	Prof.	Jin Young Kang	B	Prof.	Yunjung Baek

Class A-Prof. Jin Young Kang (jykang59@kaist.ac.kr)

Class B-Prof. Yunjung Baek (yunjungbaek@kaist.ac.kr)

Objectives for the course

1. To present and reinforce basic laboratory techniques and practices.
2. To introduce elementary methods of assessing the significance of experimental measurements.
3. To cultivate an environment that enables chemistry undergraduates to acquire a positive attitude toward chemistry and practical chemical laboratory research.

Course requirement

1. Prepare satisfactorily in advance for upcoming experimental laboratory work.
 - a. Complete pre-laboratory reading preparation to help make for successful experimentation.
2. Write up and submit lab reports. Includes the following (below, but see evaluation).
 - a. Prepare timely submission of lab reports (Grading will be based on the following criteria).
3. Supply detailed observations and other experimental facts.
 - a. Show methods of how experimental data were processed in detail.
 - b. (Note) For quantitative analytical experiments, present calculations and conclusions, including accuracy and precision of experimental results (significant figures).
 - c. Consider errors and the inherent errors based on the measurements.

Grading

- Total: 8 experiments (each 100 pts) + two exams (each 100 pts) = 800 pts + 200 pts = 1000 pts
Mid-term exam (Inorganic chemistry, 100 pts) + Final Exam (Biochemistry, 100pts)
- **Grades: A (45-50%), B(45-50%), C-D(5%), F per class**

Examination Information

- Mid-term examination (Inorganic chemistry, 10%, 100 pts) + Final Exam (Biochemistry, 10%, 100 pts)

Methods of Evaluation

The student will be evaluated based on his/her in-lab performance involving criteria listed below.

Point total per experiment = 100 points

- 1) Attitude (20 points)
 - a) Punctuality (5 pts)
 - b) Exhibition of proper lab safety (5 pts)
 - c) Appropriate cleanliness; e.g. uncluttered research area (5 pts)
 - d) Appearance of being undistracted and focused on tasks at hand (5 pts)

- 2) Laboratory Reports (80 pts)
 - a) Introduction (10 pts) & Procedure Summary (10 pts)
 - b) Data & Results (30 pts)
 - i) Quantitative results: Data & Calculation, Table & Graphs
 - ii) Qualitative results: Observations
 - c) Discussion (30 pts)
 - i) Summary
 - ii) Assessment of results
 - iii) Conclusions
 - d) Inclusion of literature references (attention to ACS formatting).
 - i) example: Park, Y.; Heo, J.; Baik, M.-H.; Chang, S. Why is the Ir(III)-Mediated Amido Transfer Much Faster Than the Rh(III)-Mediated Reaction? - A Combined Experimental and Computational Study. *J. Am. Chem. Soc.* **2016**, *138*, 14020– 14029, DOI: 10.1021/jacs.6b0821

Lists	Section	Points	Explanation												
Attitude		0~20	<ul style="list-style-type: none"> • Punctuality (5 pts) • Exhibition of proper lab safety (5 pts) • Appropriate cleanliness; e.g. uncluttered research area (5 pts) • Appearance of being undistracted and focused on tasks at hand (5 pts) 												
Laboratory Reports		0~80	<table border="1"> <tr> <td>Date</td> <td>(If this part is missing, 3 points are deducted)</td> </tr> <tr> <td>Name</td> <td>(If missing, 3 points are deducted)</td> </tr> <tr> <td>Pre-lab (10 pts) Introduction (10 pts) Procedure (10 pts)</td> <td> <ul style="list-style-type: none"> • Pre-lab (only in biochem) • Introduction • Procedure Summary </td> </tr> <tr> <td>Data & Results (30 pts)</td> <td> Use Report Sheet in each experiment on the manual <ul style="list-style-type: none"> • Data or Analysis • Calculations (with units) • Graphs • Tables </td> </tr> <tr> <td>Discussion (30 pts in inorganic/20 pts in biochem)</td> <td> <ul style="list-style-type: none"> • Summary • Assessing the results (Analysis) • Conclusions </td> </tr> <tr> <td>Reference</td> <td>(If missing, 3 points are deducted)</td> </tr> </table>	Date	(If this part is missing, 3 points are deducted)	Name	(If missing, 3 points are deducted)	Pre-lab (10 pts) Introduction (10 pts) Procedure (10 pts)	<ul style="list-style-type: none"> • Pre-lab (only in biochem) • Introduction • Procedure Summary 	Data & Results (30 pts)	Use Report Sheet in each experiment on the manual <ul style="list-style-type: none"> • Data or Analysis • Calculations (with units) • Graphs • Tables 	Discussion (30 pts in inorganic/20 pts in biochem)	<ul style="list-style-type: none"> • Summary • Assessing the results (Analysis) • Conclusions 	Reference	(If missing, 3 points are deducted)
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Reference	(If missing, 3 points are deducted)														
Total		0~100													

References

- 1) Experiments were adapted and developed from literature sources:
 - (a) PHYWE Physics Laboratory Experiments Manual 2006/2007
 - (b) *Inorg. Synth., J. Chem. Ed.*,
 - (c) Biochemistry Laboratory Experiment Manual, KAIST, Chemistry Department, 2006
- 2) Handbooks
 - (a) *CRC handbook of Chemistry and Physics* (CRC press, Boca Raton, Florida)
 - (b) *Merck Index* (Merck & Co., Rahway, New Jersey)
 - (c) *Lange's Handbook of Chemistry* (MaGraw-Hill, New York)

Tentative Schedule and Topics

1) Schedule

Week	Date/ Time (Wed, Fri)/ 13:00~19:00)	Experiment #					Notes
		Mon	Tue	Wed	Thu	Fri	
1	9/4, 9/6			[Exp0]		[Exp0]	
2	9/11, 9/13			[Exp1]		[Exp1]	
3	9/18, 9/20					[No class]	
4	9/25, 9/27			[Exp2]		[Exp2]	
5	10/2, 10/4			[Exp3]		[Exp3]	
6	10/9, 10/11					[Exp4]	
7	10/16, 10/18			[Exp4]			
8	10/21~10/25						
9	10/30, 11/1			[Exp5]		[Exp5]	
10	11/6, 11/8			[Exp6]		[Exp6]	
11	11/13, 11/15			[Exp7]		[Exp7]	
12	11/20, 11/22			[Exp8]		[Exp8]	
13	11/27, 11/29			[Exp9]		[Exp9]	
14	12/4, 12/6						
15	12/11, 12/13						
16	12/16~12/20						

Course Web Site for General Chemistry and General Chemistry Laboratory: <http://chemlabinkaist.net/>

2) Topics

Topics	TA in charge
Exp. 0. Introduction, laboratory behavior and related instructions, and safety	
Exp. 1. Synthesis of $\text{Cr}(\text{acac})_3$ and $\text{Co}(\text{acac})_3$	
Exp. 2. Tetraphenylporphyrin and Its Copper(II) Complex	
Exp. 3. Ferrocene and Its Derivative (1)	
Exp. 4. Ferrocene and Its Derivative (2) and (3)	
Exp. 5. Polymerase Chain Reaction (PCR)	
Exp. 6. DNA Purification	
Exp. 7. Plasmid Ligation and Transformation	
Exp. 8. Protein Purification and SDS PAGE (I)	
Exp. 9. Protein Purification and SDS PAGE (II)	

Assignment Submission

- Online submission: www.turnitin.com.
- Create your account. Enter Class ID and Password (provided by TA).
- Enter your name in Korean or English.
- Submission due: The submission will close at 23:59 on the day before the next lab class is set to begin. You should use MS-word to produce your written assignments.
- Posting grade: Within 3 days from due date of the report.
- Claim period: Within 2 days from the date of the posting grade.

o Safety Education

Due to the KAIST's policy, the following contents were applied to the undergraduate experimental subject. Each student must receive 3 or 6 hours per semester. (if you belong to the laboratory, complete 6 hours)

- Watch the KAIST online safety education video, send the certificate to the TA after completion.

- Training Method and Certificate of Completion

[Safety Team] - [Laboratory Safety Management System] - [Laboratory Safety Education] - [Online Education]

Visit and watch the necessary video and submit the certificate **by November 30th (Saturday)**.

- Follow the manual uploaded to KLMS for more information

If you do not submit a certificate, your attitude score for all experimental reports will be deducted by 50 percent (each 10 points, total 80 pts).

Policy for Late Lab Report

You should submit your assignment through **Turnitin** by the due date.

- To (i) upload the assignment file by the due date and (ii) to check for successful **Turnitin** uploading are the student's responsibility.
- **Warning!** We will not accept excuses or compromises if points are deducted due to your late report submission (see below).
- If you miss the last submission chance, you do not need to submit it at all.
 - Within 24 hours (last chance): -10 points
 - More than 24 hours: -80 points

Our Guidelines to check Plagiarism Using the Turnitin Software

Reports having similarity ranges from 16% to 100% or the following common sources (below) will be judged as plagiarism that results in a laboratory report grade of zero (case by case; determined by chief TA and instructor).

Example 1. Text matching

- Overall Similarity index: **Should not exceed 24%** (24% and below gives the color code-Green, in Turnitin, indicating that it is within the acceptable range).
- Single source similarity index: Should not exceed 2%
- Acceptable number of words in an unbroken string (phrase or sentence): **Should not exceed 10 words**

The color of the report icon indicates the similarity score of the report, based on the amount of matching or similar text that was uncovered. The percentage range is 0% to 100%. The possible similarity ranges are:

- **Blue:** No matching text
- **Green:** One word to 24% matching text
- **Yellow:** 25-49% matching text
- **Orange:** 50-74% matching text
- **Red:** 75-100% matching text

TITLE	SIMILARITY
Submission	0% 
Submission	6% 
Submission	43% 
Submission	58% 
Submission	80% 

If you receive an orange 52% similarity percentage, that means that 52% of your paper is exactly the same as other sources found by Turnitin. Even in the case of 15% similarity, if the matching text is one continuous block of borrowed material (should not exceed 10 words), it will be considered as plagiarized text of significant concern.

Example 2. Cut/Copy and Paste material from the Web, textbooks or online manual, data (“lifting” phrases, sentence and paragraphs of someone’s work beyond an acceptable number of words)

Example 3. Copying the work of another student

END