

VC211 Chemistry Lab Orientation

UM-SJTU JI

Asso. Prof. Ting Sun (孙婷)

Email: ting.sun@sjtu.edu.cn

Phone ext. 4391

Office No.:439A



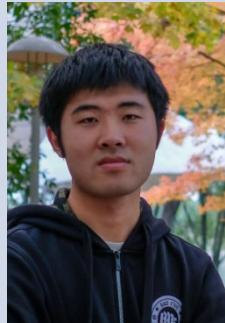
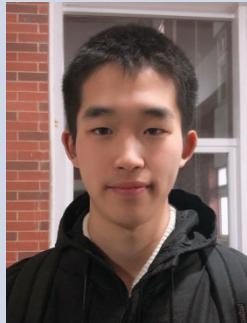
About Me...

B.E. & B.A., Chem. E. & English, Dalian University Technology (大连理工大学)
M.S., Chemistry, University of Oklahoma, U.S.A.
Ph.D., Chem. E., University of Arizona, U.S.A.

Research Scientist, Cabot Microelectronics Corp., U.S.A.
Asso. Prof., Sichuan Normal University (四川师范大学)



About Your TAs...

Name	Photo	Name	Photo
Qirui Wu 吴启瑞 S1, S7		Yuejie Guo 郭蕴捷 S5, S11	
Pengyuan Huang 黄鹏远 S2, S8		Yuntian Zhao 赵云天 S6, S9	
Siyi Zheng 郑思仪 S3, S10		Pengnan Chi 迟朋南 S4, S12	

Yiqing Zhao (赵漪青) Coordinator



Please refer to Canvas or TA for office hour location and time.

About the Schedule...

Class is divided into 12 sections, each section to report to the labs according to the following schedule:

S1/S2: Wed. 08:00-11:00

S3/S4: Wed. 18:00-21:00

S5/S6: Thur. 18:00-21:00

S7/S8: Frid. 08:00-11:00

S9/S10: Frid. 13:00-16:00

S11/S12: Frid. 18:00-21:00

WK	Dates	Experiment Topics: Lab dates W, Th, F	Lab Manual Pages
1	Wed. Feb. 27	Introduction and Safety Rules – one lecture, no labs 14:00-15:40, at Shangyuan building Room A100	MANDATORY LECTURE
2	Mar. 6-8	E1: Acids and Bases 1. Relative Acidity/Basicity of Common Household Products 2. Acid-Base Titration of vinegar.	PLE1, PLQ1 DUE
3	Mar. 13-15	E2: Properties of Buffers 1. Strong and Weak acids 2. Properties of a buffer 3. Designing a Buffer 4. Determination of Buffer Capacity	f ALR1 E1 REPORT DUE g. PLE2, PLQ2 DUE
4	Mar 20-22	E3: Spectrophotometric Analysis 1. Adjusting the Spectrophotometer 2. Preparation of Standard Solutions 3. Making the Calibration curve Using the Standard Solutions 4. Determination of Unknown Concentration.	- ALR2 E2 REPORT DUE - PLE3, PLQ3 DUE
5	Mar 27-29	E4(I)&E4(II): Introduction to Kinetics, Determining the Rate Law 1. Effect of Changing the Concentration of Reactants 2. Effect of Changing the Temperature 3. Effect of Adding a Catalyst 4. Designing Reactions to Determining the Reaction Order.	- ALR3 E3 REPORT DUE - PLE4(A&B), PLQ4(A&B) DUE
6	Apr. 3-5	E5: Precipitation and Water Purity 1. What is the Precipitate? 2. Precipitation Studies A. Is Precipitation Predictable? 3. Concentration and precipitation 4. Solvent Pollution and Precipitation. Individual reports due, each student must submit one group report immediately after conducting the experiment.	- ALR4 E4(A&B) REPORT DUE - PLE5, PLQ5 DUE ALR5 E5 TEAM REPORT DUE
7	Apr. 10- 12	NO LAB (no labs and no VC211 class meeting) / Prepare for next week your final report on Ca analysis and final presentation on select experiment.	- STUDY & ASSIGNMENTS PREPARATION
8	Apr 17-19	Final PPT presentation on select experiment & Final Report on Ca analysis in Ca-commercial products. Students/Groups to appear either on their labs or as scheduled by your TA on Canvas.	- FINAL PPT DUE - FINAL REPORT EXPT. DESIGN: Ca- ANALYSIS DUE
9	TBD	Final Exam: Time & location see CANVAS	Test schedule may change

VC211 SPRING 2019 LABORATORY COURSE SCHEDULE
TENTATIVE SCHEDULE SUBJECT TO CHANGE

About the Schedule...

Office Hours

Office Hours Instructor / TA's :

Lecturer	Room - Location	Office Hours Time	Contact
Dr. Ting Sun	Chemistry Bldg A Rooms A224 or A226	16:30-17:30 W and During W, TH lab sessions between 19:00-20:30	Ext. 4391 ting.sun@sjtu.edu.cn
TAs	See CANVAS or TA	See CANVAS or TA	

Appointment can be made through email.

About the Grading...

GRADING GUIDE	MAX. POINTS	MAX. % GRADE
5 EXPERIMENTS 150 POINTS EACH AS FOLLOWING: a. PLE: PRE-LAB EXERCISES 30 POINTS <i>Including the pre-lab quiz grade.</i> b. PLQ: POST-LAB & DATA SHEET 40 POINTS c. EXPT'L OPERATION LAB WORK 50 POINTS <i>"TA gives grade at end of experiment"</i> d. ALR: AFTER-LAB REPORT 30 POINTS	750	75%
EXPERIMENTAL DESIGN REPORT: Relies on experiments 1 & 3 analyzing calcium (Ca) in commercial products	50	5%
FINAL EXAM: CLOSED BOOKS & NOTES	150	15%
FINAL PPT ON SELECT E1-E5 EXPERIMENT: Each group to present one assigned experiment during the 8th week of lab. You must document your experimental work with few photos to include in your reports and presentation.	50	5%
TOTAL	1000	100%

About the Flowchart...

Week 2-6

Before the lab:

- ✓ Read the lab manual
- ✓ Pre-Lab Exercises, PLE



During the lab:

- ✓ Attend the lecture and demo by Ting
- ✓ Assemble in your lab
- ✓ TA instruction and Quiz (turn in reports)
- ✓ Short discussion
- ✓ Conduct the lab work
- ✓ Check out lab



After the lab:

- ✓ Finish analysis and reports.

Week 7-9

- Presentation
- Design report
- Final Exam

Where to look for course-related materials and announcements?

About the Report...

Each Experiment Lab. Reports

1. Title, Name
Chinese/Pinyin
, ID, Group #,
Group Name
Chines/Pinyin

2. Introduction,
background,
theory
3. Procedure
4. (Pre-Lab
Exercises)

PLQ
& Remaining ALR

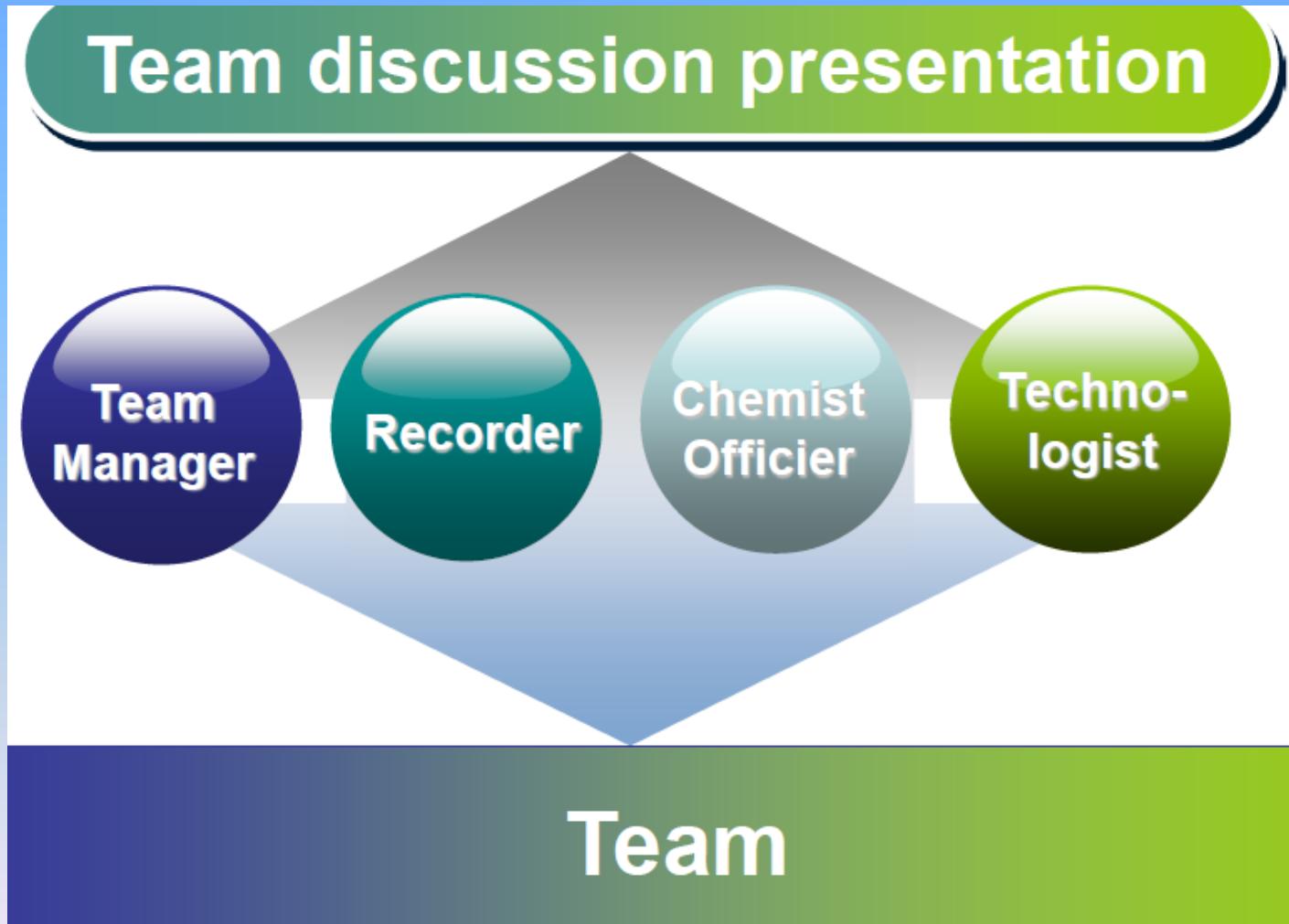
- 5. Data
- 6. Calculations
- 7. Results and discussion
- 8. Questions
- 9. Conclusions, Recommendations
- 10. References

PLE report 1-4

PLQ & ALR reports 1 thru 10

About the Presentation...

Team Work



Teams of three to five students will be assigned by TA at the first lab session.

About Safety!!!

- All safety rules must be observed at **ALL TIMES**
- All students must be prepared prior to working in the lab.
 - Complete ALR
 - Attend pre-lab presentation



Failure to observe the safety policies will result in dismissal from the lab!

VC211 CHEMISTRY LABORATORY SAFETY DISCLOSURE FORM: EACH STUDENT MUST SIGN FORM BEFORE CONDUCTING ANY LAB WORK

学生实验安全承诺

为保障学生个人和实验室的安全,学生进入实验室之前,请仔细阅读以下《学生实验安全承诺》:

1. 初次进行化学实验前自愿接受安全教育,了解使用水、电、气及化学试剂的基本知识和紧急事故处理办法;
2. 做实验前,根据所做实验的安全要求做必要的准备和充分的预习,在得到教师允许的情况下进入实验室,开始实验;
3. 进入实验室穿实验服,实验操作过程中佩戴防护眼镜,不穿短裤、短袖衬衫、裙子、高跟鞋、拖鞋、凉鞋等进入实验室;
4. 在实验室内不吸烟、不饮食、不大声喧哗及追逐打闹,实验时思想集中,按照实验步骤认真操作,未经允许不随意改动实验操作前后次序;
5. 严格按照要求取用各种化学试剂,不浪费化学试剂、不随意混合各种试剂或将试剂倒入水槽,按规定回收或将试剂倒入指定废液缸,不将实验室内物品带出实验室;

6. 实验结束后，关闭门、窗、水、电、气等阀门，经指导教师检查认可后，再离开实验室。

本人认真阅读了以上条款，并同意履行。若因违背上述承诺造成意外人身伤害事故，后果本人自负。

课程名称:	
实验时间:	_____至_____学年第____学期____周星期____上午/下午/晚上
班级:	
全班学生 签名:	
时间:	_____年____月____日

注：本承诺书由基础化学实验中心负责妥善保管

About Safety!!!

Safety Rules1- Personal Safety Requirements



- Eating, drinking, smoking in the labs are strictly forbidden.
- Do not taste or smell laboratory chemicals.
- Radios, musical instruments and mobile telephones are not allowed in the laboratory.
- Do not use cracked or chipped glassware.



About Safety!!!

Safety rules 2- Eye Protection



**Wear safety goggles.
(No contact lenses).**



About Safety!!!

Safety rules 3- Proper Clothing



Avoid floppy clothing!



Tie back
loose hair!

- ◆ Wear proper clothing and minimize skin exposure while in the lab.
- ◆ Long pants and long sleeved shirts. **No sandals.**
- ◆ Long hair should be tied back.
- ◆ Lab coats are ~~recommended~~ **Required**

About Safety!!!

Safety rules 4- Washing Hands

Always wash your hands thoroughly to remove any potential chemical residues before you leave the lab.



About Safety!!!

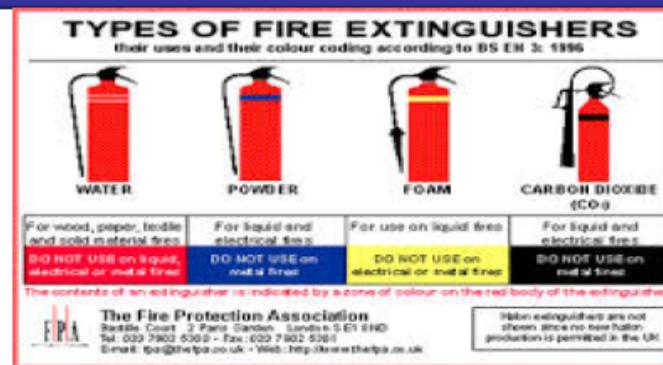
Safety rules 5-

Lab Safety Equipment



- Know the location and use of safety equipment!
- Never leave a reaction or heat source unattended.

Always immediately inform the instructor of any accident.



Fire Extinguishers



(1)
**Aim nozzle
at base of
fire.**



(2)
**Pull out
locking key
pin**

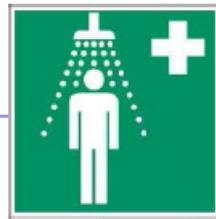


(3)
**Squeeze
handles.**

About Safety!!!

Safety Shower

Any **chemical spill**
on a person should
be washed off
immediately and
thoroughly using
the safety shower.



**Pull the chain to start
the flow of water!**

Safety Eyewash



*Any **chemical**
contacting one's
eyes should be
immediately and
thoroughly rinsed
out using the safety
eyewash found in
every laboratory.*

About Safety!!!



SAFETY HIGHLIGHTS

- YOU ARE RESPONSIBLE FOR YOUR OWN SAFETY FIRST THEN OTHERS
- BROKEN GLASS, PREVENTION & DISPOSAL □ HOW TO WASH & RINSE GLASSWARE □ WEAR GOGGLES & LAB COATS
- KEEP GLASSWARE AT LEAST 20cm AWAY FROM EDGE OF BENCH
- CLUTTER (MESS)
- CHEMICAL WASTE & DISPOSAL (ORGANIC, INORGANIC &, CORROSIVES, & SOLIDS) □ WASTING CHEMICALS BE CONSERVATIVE & PROTECT ENVIRONMENT □ IMMEDIATELY STORE AWAY STOCK CHEMICALS (COVER ON TIGHTENED & TOP BENCH)
- SAFETY RUBBER GLOVES (CORROSIVE LIQUIDS RESISTANT & SOLVENTS RESISTANCE)
- SAFETY CLOTH GLOVES & TONGUES: HEAT PROTECTION, HOT PLATES, & BURN PROTECTION □ FIRE HAZARDS & PROTECTION (EXTINGUISHERS) □ SPATULAS □ CHEMICAL TRANSPORTATION PROHIBITED, NOT EVEN ALLOWED TO TAKE OUTSIDE THE DOOR

LABORATORY SAFETY INSTRUCTIONS

UNIVERSITY OF MICHIGAN



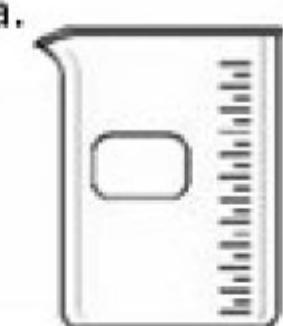
Although the experiments contained in this lab manual are designed to provide you with a safe lab experience and use low-toxicity compounds, there are some very basic safety rules that you must follow when in any chemistry laboratory. When safety rules such as those given below are followed strictly, serious injuries rarely occur.

- 1. You must wear safety goggles at all times.** Safety goggles must be worn over your eyes (not on your forehead) at all times while in the lab and when anyone in the lab is conducting an experiment.
- 2. Wear proper clothing.** Wear clothing that covers your arms, legs, and torso to protect yourself from possible chemical spills. Do not wear shorts or sandals or loose flowing sleeves. It is wise to not wear your new clothes because chemical spotting may occur from time-to-time. Lab aprons are available and generally required.
- 3. Do not taste or touch or smell laboratory chemicals.** Tasting of lab chemicals is strictly forbidden as is eating or drinking foods in the lab. Any of these can easily lead to poisoning.
- 4. Do not use cracked or chipped glassware.** Replace or exchange such glassware or fire polish the chips as directed by your instructor.
- 5. Know the location and use of safety equipment.** Be sure you know where the eyes wash station, safety shower, fire blanket, and fire extinguishers are in your laboratory. Make sure you talk with your instructor about when and how they are to be used.

- 6. Know the location of the emergency exit. Know how to exit the lab and building.**
- 7. Never leave a reaction or heat source unattended. If you have long hair, tie it back out of the way of any heat sources.**
- 8. Inform your instructor of any skin contact with chemicals and immediately wash the affected area with large volumes of water. Use a faucet for the hands and arms. Use an eye wash fountain for your face. Initially keep your goggles in place so as not to wash the chemical into your eye. If an immediate, heavy burning sensation is felt on your torso or extremities use the safety shower.**
- 9. Inform your instructor of any chemical spills. Spills, no matter how small, must be addressed immediately to avoid others from unknowingly getting injured. Many spills can be handled by soaking it up with a wet cloth or sponge, flushing the remains with water several times, and then drying the effected area. However, there are exceptions so you need to check with your instructor.**
- 10. Inform your instructor of any cuts. If the cut is small, wash it with water.**
- 11. Read and follow the safety notes for each experiment. Every experiment points out specific hazards and safety procedures to follow. Read the safety directives carefully before you go to lab. If any of the safety procedures are unclear, discuss them with your instructor.**
- 12. Think before reacting. Most injuries occur from not following safety procedures or reacting too fast to a situation. The best response is to take time to think about an unsafe situation ie., it is not safe to catch a falling beaker of corrosive chem.**

What is this?

Beaker



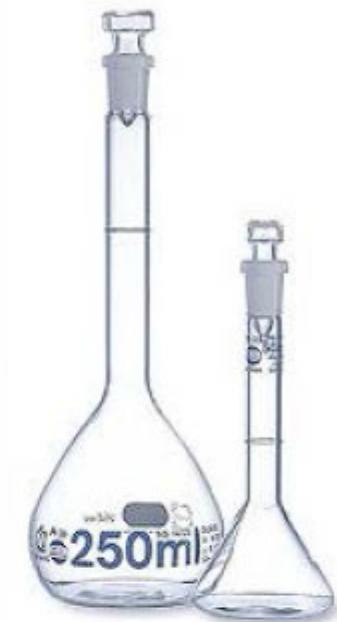
Buret



**Volumetric
Pipet**



**Graduated
cylinders**



**Volumetric
flasks**

What is this?



Glass funnel



Test tubes



Wash bottle



Erlenmeyer
flask

Questions?