



General Chemistry Laboratory

Course Introduction, Check-In, and Lab Safety



Course Objectives

General Chemistry



General Chemistry
Laboratory

- Verify key chemistry principles (e.g. buffer solution, redox reaction, equilibrium, Hess' law, Beer's law, chemical kinetics, etc.) via hands-on activities.
- Practice entry-level experimental skills (e.g. weighing chemicals, dilution, titration, filtration, etc.), collect and analyze data, and write lab reports.
- Experiments include both *qualitative* and *quantitative* analysis
- Maintain good communication with coworkers (TA, ATAs, classmates).



Week 1 Agenda

- Introduction of TA and associate TAs
- Taking attendance
- Course policies & schedule
- Grading scheme
- How to write lab reports
- Online course resources
- Evacuation & fire extinguisher demo
- Lab safety guidelines



Course Policies (Attendance)

1. Please be punctual and never miss a class. Do not leave class prematurely.
2. Each absence deducts 10 pts from your semester grade. With three absences, you automatically fail this course.
3. 1 point (2, 3 pts) will be deducted from your semester grade every time you are late for <10 min (10-20, 20-30 min). If you enter the lab more than 30 min late or after the instruction period, you will get an absence and are not allowed to start the experiment.
4. Official/funeral leaves: Provide proof documents to TA at least one day in advance. The leave is granted only with permission.
5. Sick leave: Email the TA as soon as possible and hand in the medical certificate(s) within one week of the lab date.
6. When you miss a lab, check the schedule and arrange a make-up experiment with your TA.



Leave Request Form

- <https://www.ch.ntu.edu.tw/en/laboratory-courses.html>

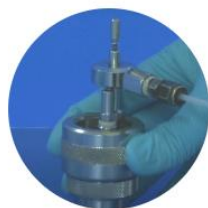
Laboratory Courses



General Chemistry
Laboratory



Organic Chemistry
Laboratory



Physical Chemistry
Laboratory



Analytical Chemistry
Laboratory

Lab Rules

Procedure of requesting leave of absence

Leave application

National Taiwan University

Leave of Absence Request Form

ID Number		Name		School	
Department/ Year		Type of Leave			
Starting Date/Time	Year	Month	Date	Time	No. of Days
	Y Y Y Y	M M	D D	H H : M M	
Resumption Date/Time	Year	Month	Date	Time	No. of Hours
	Y Y Y Y	M M	D D	H H : M M	
Date of Application			Class not Attended	<input type="checkbox"/> General Chemistry Lab	
				<input type="checkbox"/> Organic Chemistry Lab	
				<input type="checkbox"/> Analytical Chemistry Lab	
				<input type="checkbox"/> Physical Chemistry Lab	
Reasons					

The permission for the leave of absence from class that the student has requested is granted.

Signature of Teaching Assistant: _____ Date: _____

※The supporting documents are attached here.

(e.g. medical certificates, funeral invitation cards, etc.)

Email the form to your TA



Teaching Group (Spring 2024)

▪ Instructors

- CHAN, Jerry Chun Chung (陳振中 chanjcc@ntu.edu.tw)
- LIN, Chih-Kai (林至闓 ethenelin@ntu.edu.tw)
- SHE, Jui-Lin (佘瑞琳 shirlin@ntu.edu.tw)

▪ Teaching assistant

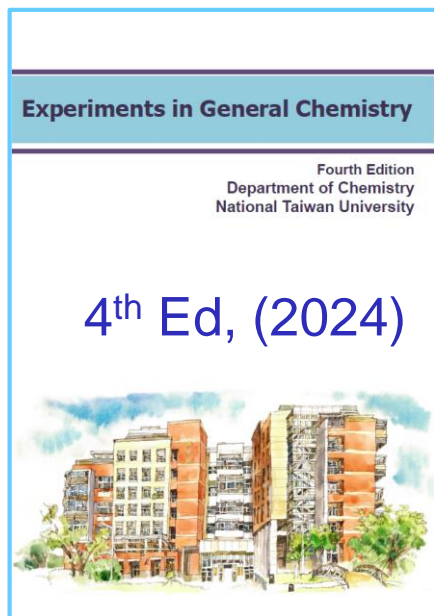
- CHANG, Hsin-Yun (張馨云 chy037@ntu.edu.tw)
- WU, Mei-Ling (吳美伶 maylinwu@ntu.edu.tw)
- HSIEH, Ping-Hsuan (謝秉璇 phhsieh827@ntu.edu.tw)
- HUANG, Yi An (黃奕安 andyhuang@ntu.edu.tw)
- SHEN, Yen-ping (沈晏平 yenping@ntu.edu.tw)
- LIN, Hui-Ju (林惠茹 huijulin@ntu.edu.tw)
- HUANG, Chien-Wen, (黃建文 cwhuang27678@ntu.edu.tw)
- TSAI, Chuan-An (蔡荃安 chuanan@ntu.edu.tw)

▪ Stockroom staff

- CHAO, Yi-Hsiang (趙益祥 joechao@ntu.edu.tw)
- JHANG, Yuan-Ruei (張芄睿 elvischang1981@ntu.edu.tw)



Lab Manual



English version



Chinese version



**Only For
Chemistry Dept.**

Available in the bookstore at **B1 level of NTU Main Library** (have one class representative doing **group order: 20% off**)



Lab Schedule

Course schedule

<https://teaching.ch.ntu.edu.tw/gclab/news/>



國立臺灣大學普通化學實驗

最新消息

教學簡報

示範影片

實驗參考資料

實驗技能手冊

教學示範手冊

安全守則 · 上課證 · 假單

2024-08-19

學生實驗室安全守則暨上課證 (Lab Safety Certification and Identificat [...] [閱讀全文](#)

113-1 實驗進度與分班表

2024-08-19

113-1 普通化學實驗助教及助理助教分班表 113-1 普化實驗進度 113-1 General Chemi [...] [閱讀全文](#)

113 學年課程綱要

2024-08-01

113 學年「普通化學實驗」課程綱要 113 學年「普通化學實驗上下」課程綱要 113 學年「化學實驗(一)」課 [...] [閱讀全文](#)

113-1 實驗進度與分班表

[113-1 普通化學實驗助教及助理助教分班表](#)

[113-1 普化實驗進度](#)

[113-1 General Chemistry Lab Schedule](#)



Lab Schedule

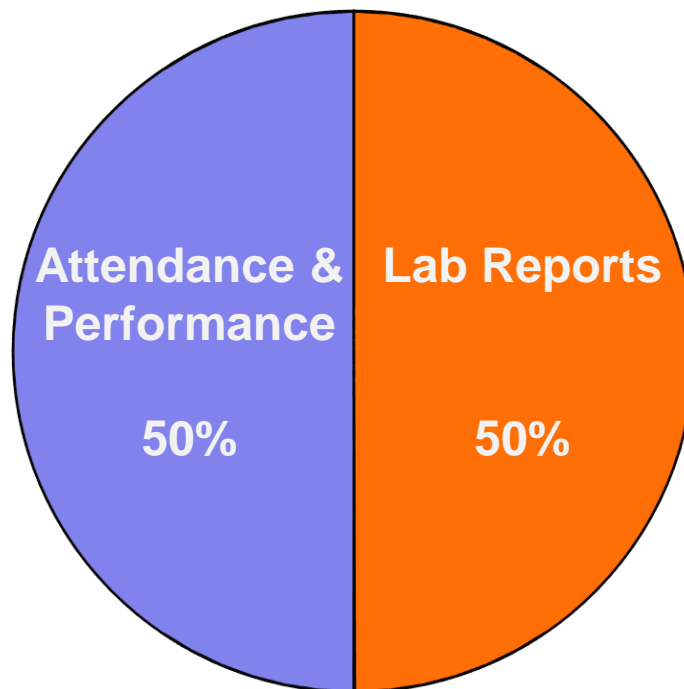
TUE	TUE(2-4)	TUE(2-4)	TUE(2-4)	TUE(6-8)	TUE(6-8)
DATE	A	B	C	A	B
	BST	AST	Agr	Chem	Chem
	Entomol	PPM			English
	J. L. She	C. K. Lin	H. M. Chen	J. L. She	C. M. Jiang
	C. W. Huang	Y. P. Shen	P. H. Hsieh	H. Y. Chang	M. L. Wu
9/3	E0	E0	E0	C0	C0
9/10	E3(A)	E2(B)	E1(C)	C5(A) Eng3	C1(B) Eng2
9/17	Day-off	Day-off	Day-off	Day-off	Day-off
9/24	E1(C)	E3(A)	E2(B)	C2(C) Eng1	C5(A) Eng3
10/1	E2(B)	E1(C)	E3(A)	C1(B) Eng2	C2(C) Eng1
10/8	Review	Review	Review	Review	Review
10/15	E6(A)	E7(B)	E5(C)	C4(A) Eng6	C7(B)
10/22	E7(B)	E5(C)	E6(A)	C7(B)	C3(C) Eng5
10/29	E5(C)	E6(A)	E7(B)	C3(C) Eng5	C4(A) Eng6
11/5	Day-off	Day-off	Day-off	C18(C)	C12(B)
11/12	E12(B)	E10(C)	E8(A)	C12(B)	C10(C)
11/19	E8(A)	E12(B)	E10(C)	C8(A)	C18(B)
11/26	E10(C)	E8(A)	E12(B)	C10(C)	C8(A)

- Note the different locations (Room A, B, C) for each lab.
- Make-up experiments can be arranged in other sessions.



Course Grading Scheme

1. Quizzes
2. Correct techniques
3. Active participation
4. Tidiness of work environment



1. Prelabs
2. Lab notes
3. Final reports
(Brief & Full)

Be punctual for every lab session

Hand in the reports on time

Grading on a curve: 10% A+, 60% A+/A/A- combined



Laboratory Reports

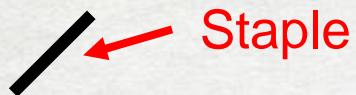
Three parts are required for each experiment:

- 1. Prelab exercises** (to be completed before class)
- 2. Lab notes**
- 3. Final reports (group A/B):**
 - Brief version (3 experiments)
 - Full version (2 experiments)



Prelab Exercises

- Every student needs to write his/her own prelab for each experiment.
- Hand-written using ball pens on lined A4 papers. (Either in English or Mandarin is accepted.)
- For safety considerations, you are not allowed to do the experiment without a prelab – you will get an absence and have to schedule a make-up experiment with TA.



Staple

Group No.
Name
Dept.

E2 Determination of the chemical formula of a compound

Objective:

Principles:

Chemicals:

Procedures:



Prelab Exercises

Include the following sections in your prelab:

I. **Objective:** Summarize the goal *concisely*.

II. **Principles:** Indicate relevant theories and chemical reactions.

} *Less than 1 page*

III. **Chemicals:** Tabulate the chemical formula, molar mass, physical and chemical properties as well as the toxicity (use *The Merck Index* or *SDS*).

III. Chemicals: 9/5

Name	Formula	Molecular Weight (g/mole)	Density (g/cm ³)	BP/MP (°C)	Solubility (g/L)	Physical Properties	Chemical Properties	Toxicity
Zinc granules (金辛)	Zn	65.38	7.14	907/419	soluble in acids alkalies	shiny, silvery gray metal	insoluble in water, strong reducing agent	relatively non-toxic, over toxicity causes nausea
Copper(II)oxide (氧化铜)	CuO	79.55	6.32	2009/1326	soluble in acids	dark colored powdery granules	Compound is canonicalized; insoluble in water	causes skin and eye irritation
Calcium chloride (氯化钙)	CaCl ₂	110.98	2.15	1935/782	745	white to off-white solid, odorless	absorbs moisture fumes, dissolves in absorbed	toxic, causes eye, skin, respiratory irritation

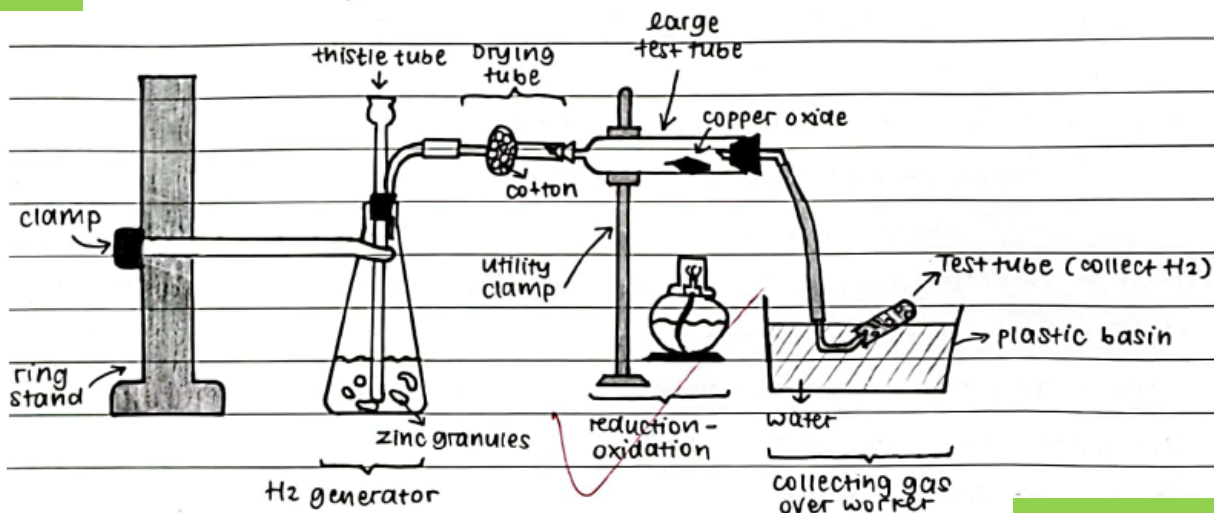


Prelab Exercises

IV. Procedures: Use a flow chart and cartoon to list the crucial operations in this experiment.

Procedures

Procedures: 5/5



Observations

- ① Wash large test tube, dry tube, and let cool.
- ② Fill drying tube with CaCl_2 ; stuff both ends with just enough cotton to prevent CaCl_2 from falling out.
- ③ Measure and record weight of large test tube ^(w1); add 1-1.2g copper oxide to middle of tube and measure weight ^(w2).
- ④ Measure 15 gram zinc granules to erlenmeyer flask and

I. observation:

- After pouring HCl , the Zn fizzed up and erlenmeyer flask became cloudy.
- Rubber tube in the water started bubbling



Lab Notes

- Leave ~1/3 page blank space next to the procedure section for recording results and your observations during the experiment.
- Use ball-point pens and avoid correction tapes (only the final reports need to be clean and legible)

Procedures

Observations

Your notes during (not before) the lab

⑥ Fill 10 test tubes with water and invert and immerse into plastic basin filled with $\frac{2}{3}$ water to collect hydrogen gas.	• After pouring HCl, the Zn fizzed up and erlenmeyer flask became cloudy.		
⑦ Pour 20 mL of 6M HCl (aq) into thistle tube; end of thistle tube should be immerse in solution and rubber tube not twisted, and gas flow is free from obstruction.	• Sound of small test tubes:		
⑧ Collect hydrogen gas over water; bring flame to opening of inverted tube; when there's a loud "pop" sound, continue collecting gas until sound quiets.	1. X	6. X	<div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block;"> ✓ : popped X : didn't pop </div>
	2. X	7. X	
	3. ✓ loud	8. X	
	4. X	9. ✓ subtle	
	5. ✓ loud	10. X	



Final Report (Brief Version)

- Record the raw data with units and observations on the reserved blank space in the prelab exercise.
- Complete the data analysis, give **the results and conclusion** in the lab manual ('Questions and Discussion' does not need to be answered).

Experiment 2

DETERMINATION OF THE CHEMICAL FORMULA OF A COMPOUND

I. Experimental Data and Results (show all calculations)

- Weight of empty large test tube (W_1) _____
- Weight of test tube and copper oxide (W_2) _____
- Weight of copper oxide ($W_2 - W_1$) _____
- Weight of test tube and copper (W_3) _____
- Weight of copper ($W_3 - W_1$) _____
- Weight of oxygen ($W_2 - W_3$) _____
- Empirical formula of copper oxide _____

- Hand in the report at the end of the class together with the prelab and lab record
- 35 points per report
- 5 pts deduction for late submission within one week
- 0 points for reports handed in more than one week late

II. Conclusion



Final Report (Brief Version)

15 pts +

I. Prelab exercise

- ✓ Objectives
- ✓ Principles
- ✓ Chemicals
- ✓ Procedures

10 pts +

II. Lab Notes

- ✓ Observation
- ✓ Operation
- ✓ Reaction condition
- ✓ Data and results
 - Calculations
 - Units
 - Significant figures

10 pts

III. Final report

- ✓ Data analysis
- ✓ Conclusion
- ~~✓ Questions and discussion~~



Final Report (Full Version)

- Complete the data analysis and calculation part in the lab manual.
- Plot data correctly, discuss potential sources of errors, and give the conclusion.
- Hand in the report in the following week, together with the prelab and lab notes.
- 50 points per report (5 pts/day deduction for late submission < 1 week).

15 pts + **I. Prelab exercise**

- ✓ Objectives
- ✓ Principles
- ✓ Chemicals
- ✓ Procedures

10 pts + **II. Lab Notes**

- ✓ Observation
- ✓ Operation
- ✓ Reaction condition
- ✓ Data and results
 - Calculations
 - Units
 - Significant figures

25 pts **III. Final report**

- ✓ Data analysis
- ✓ Elaborate results
- ✓ Error analysis
- ✓ Conclusion
- ~~✓ Questions and discussion~~



Laboratory Reports

Three parts are required for each experiment:

1. Prelab exercises (to be completed before class)

Place your prelab on the bench at the beginning of the class. The associate TAs will check and sign your prelab, and unsigned prelab will be considered as late submission.

2. Lab notes

Write down the experiment data and observations. The TA will check and sign after you finish the experiment.

3. Final reports

Brief version: Hand in the report at the end of the class.

Full version: Hand in the report in the following week

Staple the prelab, lab note, and final report together. (5 pts/day deduction for late submission within one week. 0 points for reports handed in more than one week late.)



Lab Report Grading Rubrics

Category	Guidelines	Pts
I. Prelab exercise	1. Briefly summarize main principles and relevant equations	5
	2. List the chemicals' toxicity and physical and chemical properties	5
	3. Use flow chart to explain the experimental procedures	5
II. Lab notes	4. Record data with correct significant figures and units	5
	5. Record observations, operations, and reaction conditions in details	5
III. Final report	6. Process data correctly (calculation included)	5
	7. Present final results with correct significant figures, units, and conclusion sentences	5
	8. Plot the results with correct XY axes and labeling*	5
	9. Analyze the results with appropriate error discussions*	5
	10. Elaborate findings and provide constructive suggestions*	5

***Only for full reports**



Academic Writing ABC

- No matter which language you use for writing lab reports, you are expected to write in a more formal academic style.

People have been interested in this thing for a long time.



Researchers have been interested in this phenomenon for at least 10 years.

When acid was added to the test tubes, many changed color quickly.



When 2 drops of 6 M HCl were added to the test tubes, 3 out of 6 changed color in three seconds.

Be Accurate, be Brief, be Clear

- Write objectively and keep a logical structure
- Improving your writing takes time (years), but everyone must start somewhere.



Online Resources

- NTU COOL (announcement, discussion, score-keeping)
- [General Chemistry Lab course website](#)



Online Resources

- NTU COOL (announcements and discussions)
- [General Chemistry Lab course website](#)

The screenshot shows the homepage of the General Chemistry Laboratory website. At the top, there is a navigation bar with links for Announcements, Lecture Slides, Video Demonstration, Lab Manual, Lab Technique, and Resources. Below this, the 'Lecture Slides' section features four cards: 'Check in and lab safety policy' (with safety icons), 'Notification of reports', 'Lab skills', and 'Determination of the chemical formula'. A 'more »' button is located below these cards. The 'Video Demonstration' section includes a note about English subtitles and a link to the 'NTU Chemistry Lab Channel'. It displays four video thumbnails: 'Alcohol lamp', 'Stirrer/hot plate', 'Mercury barometer', and 'Gas collection by water displacement'. On the right side, there are 'Links' for 'COOL' and 'Lab Techniques Videos' on 'YouTube'. At the bottom right, there are three 'OpenCourseWare' links for 'General Chemistry C', 'General Chemistry A', and 'General Chemistry C'.

- ✓ Lecture slides
- ✓ Demo videos
- ✓ Lab manual

Available in both Mandarin and English



Online Resources



ntuchemistrylab
6.03K subscribers

English subtitles available

SUBSCRIBE

HOME

VIDEOS

PLAYLISTS

COMMUNITY

CHANNELS

ABOUT



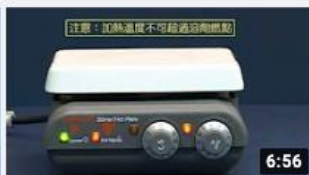
基礎化學實驗技能 ▶ PLAY ALL



基礎化學實驗技能 (1) : 酒精燈

ntuchemistrylab
39K views · 11 years ago

CC



基礎化學實驗技能 (2) : 電磁加熱攪拌器

ntuchemistrylab
19K views · 11 years ago

CC



基礎化學實驗技能 (3) : 水銀氣壓計

ntuchemistrylab
11K views · 11 years ago

CC



基礎化學實驗技能 (4) : 排水集氣法

ntuchemistrylab
23K views · 11 years ago

CC



基礎化學實驗技能 (5) : 傾析

ntuchemistrylab
13K views · 11 years ago

CC

普通化學實驗 ▶ PLAY ALL



普通化學實驗 (1) : 氮氣之莫耳體積

ntuchemistrylab
33K views · 11 years ago



普通化學實驗 (2) : 化合物化學式的決定

ntuchemistrylab
19K views · 11 years ago



普通化學實驗 (3) : 太陽能電池

ntuchemistrylab
111K views · 11 years ago



普通化學實驗 (4) : 直接甲醇燃料電池

ntuchemistrylab
37K views · 11 years ago



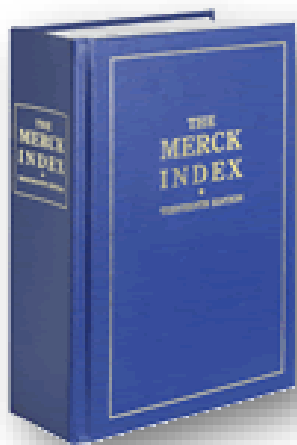
普通化學實驗 (5) : 導電塑膠聚苯胺

ntuchemistrylab
8.3K views · 10 years ago



The Merck Index

An encyclopedia of chemicals, drugs, and biologicals



(2) Name **(3) CAS No.**

(1) No. Title Chemical Abstracts Registry Number Chemical Abstracts Name

Monograph number → **9571** **α-Tocopherol.** [59-02-9] (2*R*)-3,4-Dihydro-2,5,7,8-tetramethyl-2-[(4*R*,8*R*)-4,8,12-trimethyltridecyl]-2*H*-1-benzopyran-6-ol; (+)-2,5,7,8-tetramethyl-2-(4',8',12'-trimethyltridecyl)-6-chroman-6-ol; *R,R*-*R*-*α*-tocopherol; *d*-*α*-tocopherol; 5,7,8-trimethyltolcol; Optovit; Tocovital. C₂₉H₅₀O₂; mol wt 430.70. C

(4) Name in CAS **(5) Alternate names**

Alternate names and/or trademarks (capitalized) of title compound

(6) Molecular weight **(7) Molecular formula**

Molecular weight Molecular formula

(8) Composition **(9) Reference**

Percentage composition Literature references

(10) Chemical information **(11) Other information**

Chemical information Biological, pharmacological, etc. information

Most bioactive of the naturally occurring forms of vitamin E, *q.v.* Richest sources are green vegetables, grains, and oils, particularly palm, safflower and sunflower oils. Isoln from wheat germ: H. M. Evans *et al.*, *J. Biol. Chem.* **113**, 319 (1936). Structure: E. Fernholz, *J. Am. Chem. Soc.* **59**, 1154 (1937); **60**, 700 (1938). Synthesis of *dl*-form: P. Karrer *et al.*, *Helv. Chim. Acta* **21**, 520, 820 (1938); F. Bergel *et al.*, *J. Chem. Soc.* **1938**, 1382. Total synthesis of all 8 stereoisomers: N. Cohen *et al.*, *Helv. Chim. Acta* **64**, 1158 (1981). Clinical trial in Alzheimer's disease: M. Sano *et al.*, *N. Engl. J. Med.* **336**, 1216 (1997); to improve immune function in healthy elderly: S. N. Meydani *et al.*, *J. Am. Med. Assoc.* **277**, 1380 (1997). Review of bioavailability from vitamin E supplements: M. G. Traber, *BioFactors* **10**, 115-120 (1999). Review of clinical trials in heart disease: W. A. Pryor, *Free Radical Biol. Med.* **28**, 141-164 (2000).



The Merck Index Online

- Available in NTU Main Library and Chemistry Library.
- Available online: <https://www.rsc.org/merck-index> (within NTU domain)

The screenshot shows the homepage of The Merck Index Online. At the top, there is a navigation bar with links for Home, Sign in, Publishing, ChemSpider, Education, Community, News, and More... A search bar is located on the right side of this bar. Below the navigation bar, the title "THE MERCK INDEX Online" is displayed in green and yellow text, accompanied by the Royal Society of Chemistry logo. A secondary navigation bar contains links for Home, Search, Structure Search, Browse, Named Reactions, Reference Tables, My Records, and Help. The main content area features a "Quick search" section with a large text input field and a "Search" button. Below the input field, instructions are provided: "Enter a Name, CAS Registry Number, Molecular Formula or Molecular Weight. Enclose Molecular Formula in Brackets (e.g. [C3H6O]). Molecular Weight can be input as a single value, or a range (e.g. 168.23 or 77-78)". At the bottom, there are three columns of "Other search options": "Search" (with a dropdown menu), "Structure search" (with a dropdown menu), and "Reference tools" (with a dropdown menu). A "Get started with The Merck Index Online" section is also visible, with a link to "Introduction to the database".



SDS (Safety Data Sheet)

Google search results for "SDS sulfamic acid".

Search results include:

- <https://www.carlroth.com> › SDB-4714-MT-EN PDF :
Safety Data Sheet: Sulphamic acid - Carl Roth
Jun 17, 2015 — Safety data sheet according to Regulation (EC) No. 1907/2006 (REACH)
Sulphamic acid ≥99 %, crystalline article number: 4714. Malta (en).
You've visited this page 2 times. Last visit: 8/23/22
- <https://beta-static.fishersci.com> › sds › chemicals-s PDF :
Safety Data Sheet - Fisher Scientific
Mar 25, 2015 — Sulphamic Acid, ACS ... Provide SDS document to physical and chemical safety.
Sulphamic Acid, Contains no substances with occupational health hazards.
6 pages

- When writing prelab exercises, use the **Merck index** for formula/formula weights and physical properties (density, etc.).
- Refer to **SDS** for toxicity information and potential hazards.
- *Information on Wikipedia may not always be correct.*

Safety data sheet
according to Regulation (EC) No. 1907/2006 (REACH)

Sulphamic acid ≥99 %, crystalline

article number: **4714**
Version: **3.0 en**
Replaces version of: 02.01.2017
Version: (2)

date of compilation: 17.06.2015
Revision: 17.12.2021

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Identification of the substance	Sulphamic acid ≥99 %, crystalline
Article number	4714
Registration number (REACH)	01-2119488633-28-xxxx
Index number in CLP Annex VI	016-026-00-0
EC number	226-218-8
CAS number	5329-14-6

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 (CLP)

Section	Hazard class	Cat-egory	Hazard class and category	Hazard statement
3.2	Skin corrosion/irritation	2	Skin Irrit. 2	H315
3.3	Serious eye damage/eye irritation	2	Eye Irrit. 2	H319
4.1C	Hazardous to the aquatic environment - chronic hazard	3	Aquatic Chronic 3	H412

For full text of abbreviations: see SECTION 16








The most important adverse physicochemical, human health and environmental effects

Malta (en) Page 1 / 17



GHS

The Globally Harmonized System of Classification & Labelling of Chemicals, GHS

GHS pictogram	 Health Hazard	 Flammable	 Serious Health hazard	 Corrosive	 Hazardous to the Environment
GHS pictogram	 Toxic	 Oxidizing	 Explosive	 Compressed Gas	



NTU-CH SDS

teaching.ch.ntu.edu.tw/gclab/



國立臺灣大學普通化學實驗

回首頁

臺大化學系

國立臺灣大學

EN

最新消息

教學簡報

示範影片

實驗參考資料

實驗技能手冊

教學示範手冊

線上課程

實驗問答

聯絡資料



最新消息

2024-08-19

安全守則 · 上課證 · 假單

教學簡報

教學簡報

導線

Merck index online (校園網域)

藥品安全資料表 SDS

有效數字

誤差估計及最小平方

繪圖及製作回歸線

常用基本常數及換算因子

標準還原電位

酸解離常數

鹼解離常數

更多

2024-08-01

113 學年課程綱要

更多

教學簡報

教學簡報

https://teaching.ch.ntu.edu.tw/gclab/sds/



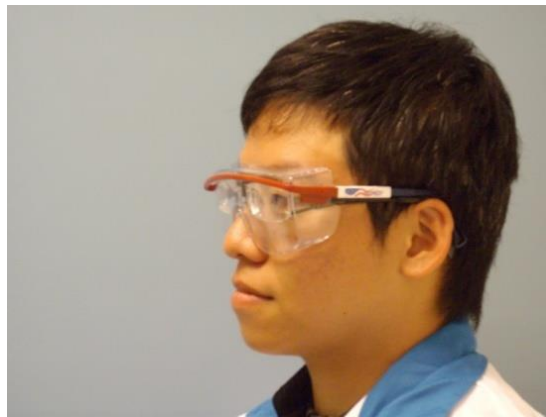


Safety Guidelines I

1. Safety goggle and lab coat must be worn at all times in the laboratory (put them on before entering the lab door).
2. Contact lenses and sunglasses are forbidden.
3. Long hair should be tied back.
4. No hair spray.
5. Long pants and closed-toe shoes are required (no flip-flops or sandals).
6. You may borrow safety goggles and lab coats from your TA (incurs grade deduction from 2nd time).
7. Bring your health ID card (健保卡) to the lab class.



Personal Protection Equipment



- Wear appropriate personal protection equipment (long pants, closed-toe shoes, lab coat, and goggle)
- Long hair should be tied back



Personal Protection Equipment (Goggle)

- Available in university shops or online.
- Must have side shields to protect from sprayed chemicals.
- Try out which design fits you the best (especially if you wear glasses).
- Contact lenses are forbidden in the laboratory.
- Do not use sunglasses as safety goggles.





Personal Protection Equipment (Lab Coat)

- Available in university shops or online.
- Preferably made of 100% cotton.

Cotton



Synthetic Fiber





Safety Guidelines II

8. If any accident occurs, deal with the situation calmly and report to the TA as soon as possible.
9. No food and drink is allowed in the lab.*
10. Cell phones should be turned off.* If your phone goes off or you are found using the phone, 5 pts will be deducted from your semester grade. (Have your family call the stockroom at 3366-4195 or 3366-4196 in an emergency.)
11. Wash your hands thoroughly before leaving the lab.
12. Take your lab coat and gloves off after leaving the lab.

*Violators will be assigned additional duties



Safety Guidelines III

13. No pranking or unauthorized experiments.
14. Park your bikes only in the designated parking area. Avoid obstructing any emergency exit.
15. Place your backpack and coat in the drawer or the designated cabinet. Do not put them on the lab floor and block the evacuation routes.
16. Clean your lab bench and personal equipment after each experiment. Replenish the inventory if anything is missing, then have the check list signed by an associate TA.
17. Hand in the “**Lab Safety Certification and Class Identification**” (page *vii* of the lab manual) in the next class.



Safety Guidelines

Lab Safety Certification and Identification

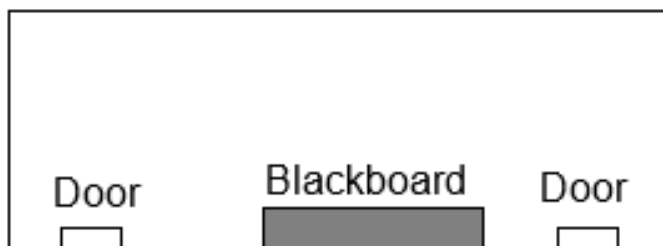
Photo

1. During the lab session, I will wear safety goggles to protect my eyes and will not wear contact lenses.
2. During the lab session, I will wear a laboratory coat and trousers. I will wear shoes that protect the entire foot and will not wear slippers or sandals.
3. I shall follow the safety rules and regulations in the lab.

I have read and understood the rules listed above.

Indicate the locations of the following items in the lab:

- (A) Fire extinguisher; (B) Fire blanket; (C) Eye wash fountain; (D) Safety shower;
(E) First aid kit; (F) Chemical absorbent; (G) Fume hood



Signature: _____ Cell: _____
Student ID: _____ Group No.: _____
Dept: _____ Date: _____
Emergency Contact: _____
Contact cell: _____



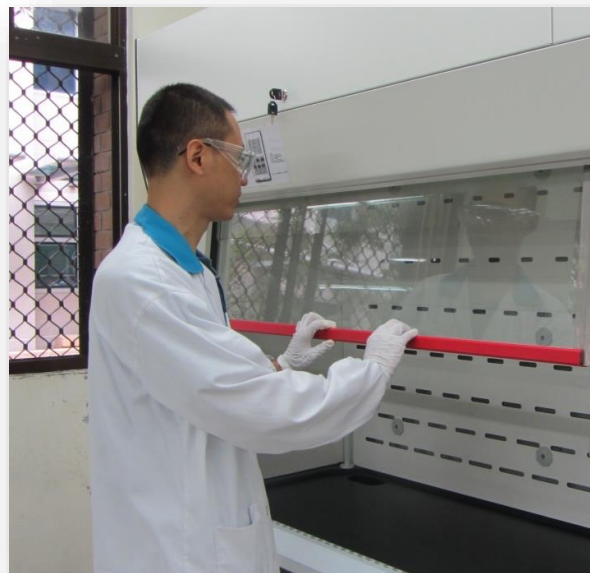
Safety Guidelines (Lab Waste)

- **Contaminated waste** (weighing paper, used gloves, etc.) goes to the trash bins in the laboratory.
- **Shattered glass** goes to the designated glassware disposal box on either side of the laboratory.
- **A solution containing heavy metals or organic solvent** should be collected and poured into the designated chemical waste container. (Do NOT pour them into the sink).
- **Recyclable waste** (aluminum cans, papers, etc.) goes to the recycling bins.
- **Do NOT dispose of lunch boxes or drink cups** in trash bins in the laboratories or the restrooms. Neither should they be left in the hallway (students on duty will have to clean them).



Fume Hood

- Use a fume hood when operating organic solvents and volatile chemicals.
- Turn on the fan motor and lights before use.
- Maintain the slash window no higher than $\frac{1}{2}$ from the bottom.
- Do NOT put your head inside the fume hood.





Safety Equipment in the Lab



First aid kits



**Chemical
absorbent**



Safety Data Sheet



Safety Equipment in the Lab



Emergency shower

(Remove contaminated clothes first)



Emergency eye wash

(Force eyes opened with fingers and rinse for at least 20 minutes)



Safety Equipment in the Lab



Fire extinguisher



Fire blanket



Fire sand



Use Fire Extinguishers (PASS)



1. **Pull** the pin
2. **Aim** low, pointing the extinguisher nozzle (or its horn/hose) at the base of the fire
3. **Squeeze** the handle to release the extinguishing agent
4. **Sweep** from side to side at the base of the fire until it appears to be out.



Essential Lab Facilities



Drying oven



Chemical waste container



Ice machine



Essential Lab Facilities



Fire sand & recycling bins



Lab waste disposal



Essential Lab Facilities (AED)

AED (automatic external defibrillator) is located at the 1F foyer of Shi-Liang Hall





Students on Duty

- **All students will take turns.**
- **The associate TAs will assign and inspect your works, which include:**
 - ✓ Clean the blackboard and erasers
 - ✓ Organize chemicals and clean analytical balances
 - ✓ Clean the fume hoods and the common area
 - ✓ Put all stools under the lab bench
 - ✓ Sort out trash bins and recycling bins
 - ✓ Sweep and mop lab floor and the aisle outside the lab
 - ✓ Unplug instruments and turn off the water supply

Cabinet for
your backpack
and
belongings

Shared shelf

Folded washcloth on the faucet
rank

Shared shelf

Hot plate

Sink

Lab bench

Your belongings

Stools tucked underneath the benchtop

Do not put your bag on the chairs / benchtop/ ground

*** Do not take the extension clamp off the stand on your lab bench**

B30 Group 30 in Lab B

品名	規格	數量	備註	檢核日期	檢核人
110-1-1					
110-1-2					
110-1-3					
110-1-4					
110-1-5					
110-1-6					
110-1-7					
110-1-8					
110-1-9					
110-1-10					
110-1-11					
110-1-12					
110-1-13					
110-1-14					
110-1-15					
110-1-16					
110-1-17					
110-1-18					
110-1-19					
110-1-20					
110-1-21					
110-1-22					
110-1-23					
110-1-24					
110-1-25					
110-1-26					
110-1-27					
110-1-28					
110-1-29					
110-1-30					

Check list in the drawer

Personal equipment inventory in the plastic basin in the cabinet

Your belongings



Check List and Personal Equipment

品名 Item	規格 Specification	數量 Quantity
燒杯 Beaker	400 mL	1
燒杯 Beaker	250 mL	1
燒杯 Beaker	100 mL	4
量筒 Graduated cylinder	50 mL	1
量筒 Graduated cylinder	10 mL	1
試管 Test tube	ϕ 16 * 100 mm	10
試管架 Test tube rack	鐵製 stainless	1
玻璃棒 Glass rod	ϕ 6 mm	1
藥匙 Spatula	塑膠製或鐵製 plastic or stainless	1
鑷子 Tweezer	鐵製或塑膠製 plastic or stainless	1
塑膠燒杯 Plastic beaker	1000 mL	1
洗滌瓶 Wash bottle	500 mL	1

Equipment should be clean and free of sticky labels





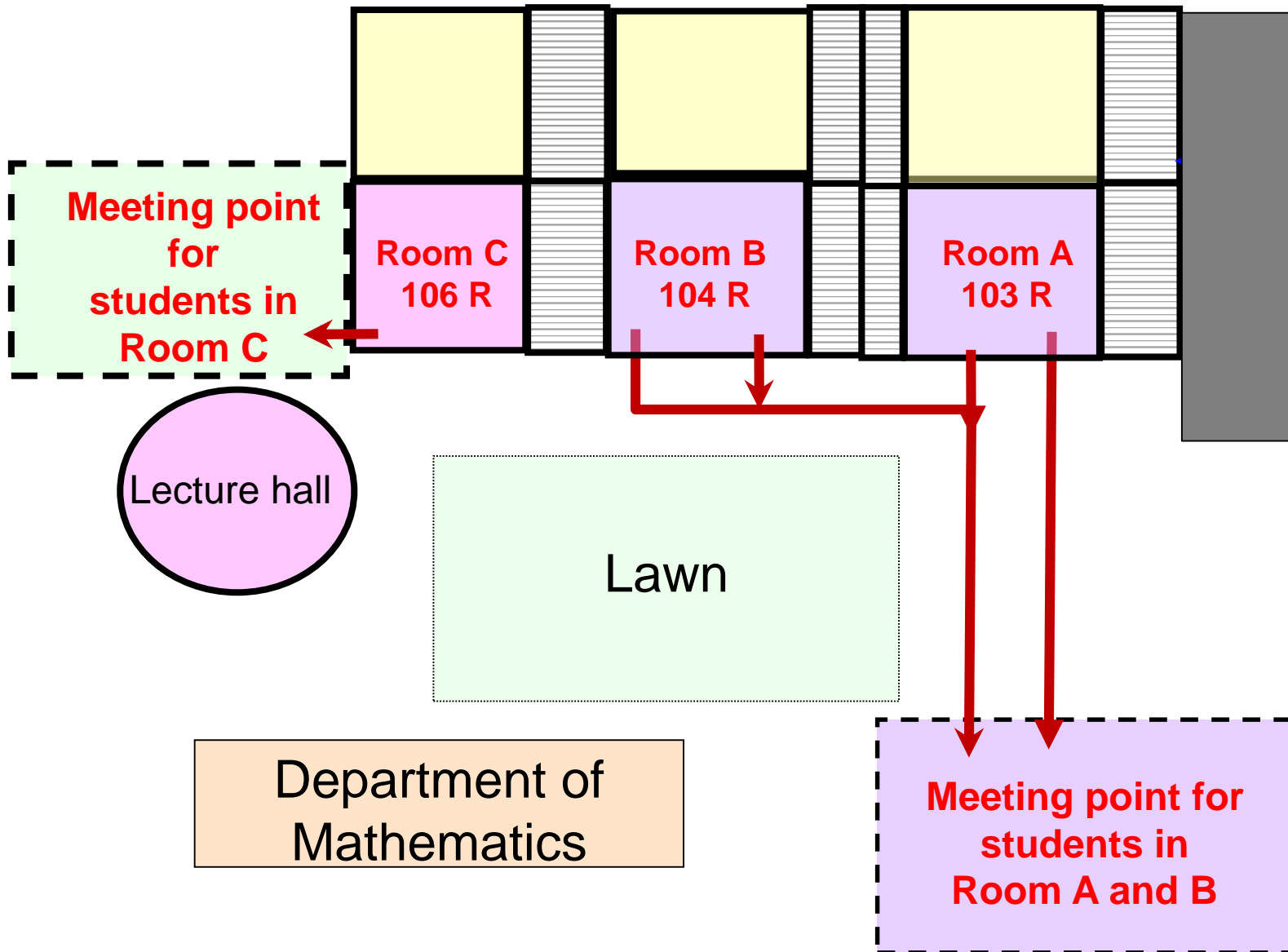
Inventory Check Out List

113-1 器材清點及補齊後簽名表

簽名 日期	週一上午		週一下午		週二上午		週二下午		週三下午		週四下午		週五下午	
	學生 簽名	助理 助教	學生 簽名	助理 助教	學生 簽名	助理 助教	學生 簽名	助理 助教	學生 簽名	助理 助教	學生 簽名	助理 助教	學生 簽名	助理 助教
8/26~8/30														
9/2~9/6							學生簽名	助教簽名						
9/9~9/13														
9/16~9/20														
9/23~9/27														
9/30~10/4														
10/7~10/11														
10/14~10/18														
10/21~10/25														
10/28~11/1														
11/4~11/8														
11/11~11/15														
11/18~11/22														
11/25~11/29														
12/2~12/6														
12/9~12/13														
12/16~12/20														



Evacuation Route





Before Next Lab

- Write your prelab exercise (lab manual, *The Merck Index*, *SDS*).
- View
 - [Guidelines on writing lab reports and using significant figures](#)
 - [Lab technique videos](#)
 - [Demo video \(E1/E2/E11\)](#)

國立臺灣大學普通化學實驗

最新消息 教學簡報 ▾ 示範影片 ▾ 實驗參考資料 ▾

基礎化學實驗技能

有機化學實驗技能

普通化學實驗