METU

ENVIRONMENTAL ENGINEERING DEPARTMENT

LABORATORY SAFETY and WORKING RULES

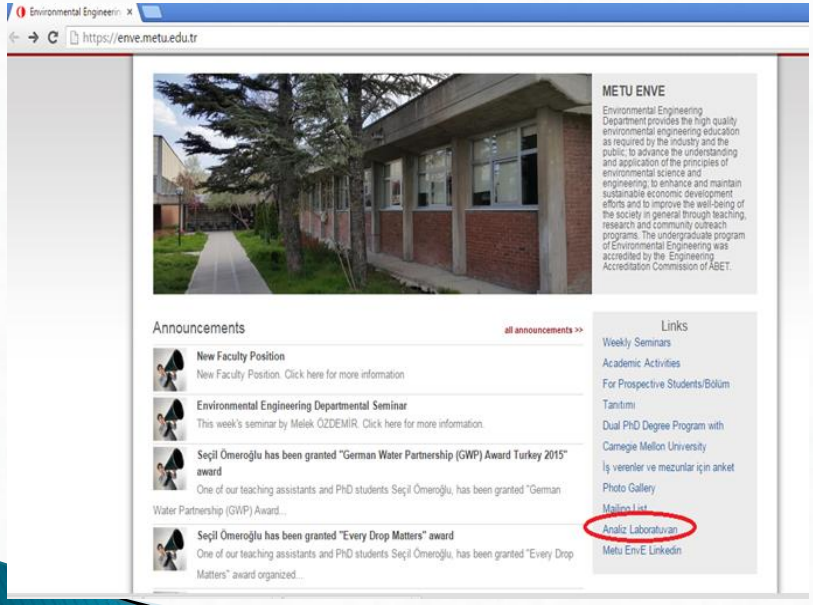
The aim of this presentation;

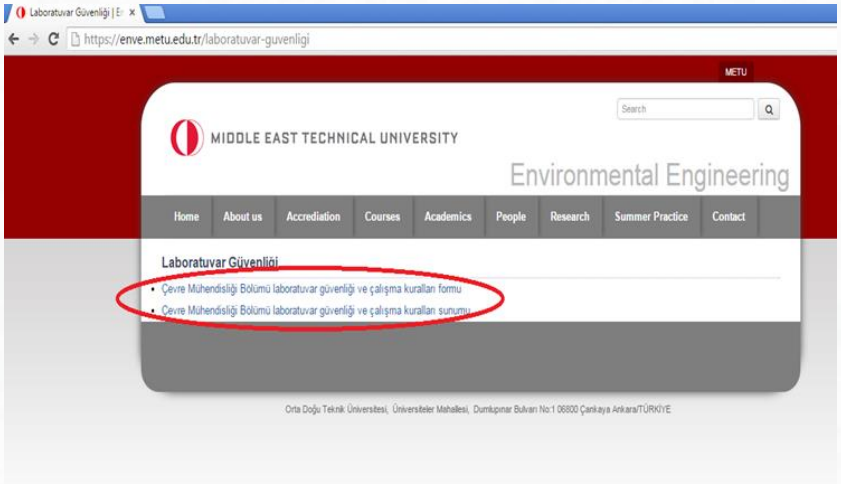
- General working rules of METU Environmental Engineering Laboratories
- Personal protections that should be taken while working in the laboratory
- The rules to be considered when working with chemicals, glasswares and devices
- The procedure of chemical waste deposition

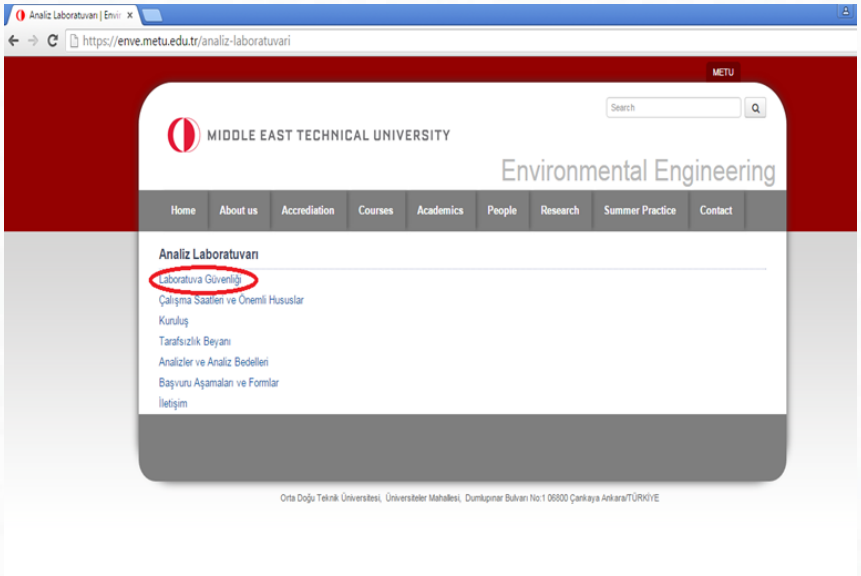
The procedures to be followed for the METU ENVE Laboratories

Before Starting to Work in ENVE Laboratories

Reading and signing of Laboratory Safety and Working Rules form by students







METU

ENVIRONMENTAL ENGINEERING DEPARTMENT

LABORATORY SAFETY AND WORKING RULES

GENERAL RULES FOR LABORATORIES

1. It should be kept in mind that the laboratory is an environment where serious work is carried out, and it is forbidden to act in a way that could disrupt the order or cause danger in laboratories.
2. All verbal or written rules must be carefully followed, any unclear issues should be asked to laboratory technical personnel, and it is not allowed to work in the laboratory without permission.
3. Students are not allowed to work in laboratories except weekdays and weekends without authorization.
4. The laboratory should not be entered without wearing an apron. Personal items like coats, jackets, handbags etc. should not be brought to the laboratory. The lab coat should be closed. Working with an open front apron is dangerous.
5. Eye and skin protective equipment such as glasses, face mask and gloves should be used according to the characteristics of the study during the period studied in the laboratory.
6. Contact lenses should not be used in the laboratory.
7. In case of chemical spills and glass fractures, always wear closed shoes.
8. Since long hair, shaky jewelry and loose dresses in the laboratory environment can cause danger, long hair should be collected at the back, shaky jewelry should be removed and loose dresses should not be worn.
9. Eating, drinking, and keeping food materials in the laboratory equipment are forbidden.
10. Hands should not be placed on the face and nothing should be taken into the mouth while working. Experimental studies should only be carried out as described and indicated by the laboratory technicians.
11. A method other than the one described and shown by the laboratory technicians must not be followed.

12. It should not be used alone in the laboratory, especially in a locked place. If the person is working on his/her own in compulsory situations, he/she has to explain the work he/she will do to another person in advance and inform them continuously.
13. The cleaning of the materials, the test setup and the test bench should be done with care before leaving the laboratory.
14. Before leaving the laboratory, gas valves and taps must be closed, unnecessary lights should be turned off.
15. After the work is finished, hands should be washed with soapy water and if necessary with an antiseptic liquid.

GENERAL RULES FOR WORKING WITH CHEMICALS

1. All chemicals in the laboratory are to be considered dangerous. For this reason, never taste or smell any chemicals. Never touch any chemical with your bare hands.
2. Always use a clean spatula to remove the solids from the bottles. Do not use the same spatula for different solids without cleaning.
3. Bottle caps (the side that touches the bottle) should never be placed on the table. Otherwise, because the cap is contaminated with foreign substances, these foreign substances may come into contact with the pure substance or solution in the bottle and disrupt it.
4. Materials in containers with lid and stopper must not be heated and heating and boiling should not be carried out in containers if the container does not have a flameproof sign.
5. Chemicals should not be mixed indiscriminately since this may create hazard.
6. Make sure that all chemical containers are appropriately labeled. The label must be read carefully before use. If the chemicals are transferred from one container to another container, new container should also be labelled. Containers must be labeled with the full chemical name, date of preparation, storage date, name of person who prepared the solution, properties of the solution and other necessary information.
7. Never return chemicals to their original containers even if they are not used and to avoid contamination never insert pipets into reagent bottles.
8. Do not use same pipette for different solutions.
9. Do not ever use your mouth to pull the liquid into a pipette.

10. Flammable liquids should be stored in a closed container on the test bench and kept away from heat sources (burner, electric heater, etc.).
11. When a liquid in the tube is to be heated, the tube should be gently heated from the top and the tube should be shaken very lightly. Point the mouth of the test tube away from yourself and all other people and never look down into it.
12. Chemical wastes must be collected according to the instructions of laboratory technical personnel and chemicals should not be poured into the sinks and other places.
13. Avoid inhalation of toxic vapors and gases. When using acids such as Sulfuric acid, nitric acid, hydrochloric acid, hydrofluoric acid and substances containing toxic gases such as bromide, hydrogen sulfide, hydrogen cyanide, and chlorine work in a fume hood.
14. While diluting acids you should always add acid to water. Never pour water on acid.
15. If the mercury is poured in any way, it must be collected with a vacuum source or foam type synthetic sponges. If its amount is too small to be collected, powder sulfur should be sprinkled on it.
16. If a mercury thermometer breaks, mercury and thermometer pieces containing mercury should never be thrown into the trash or the sink.
17. If chemical substances and / or samples are spilled into the laboratory environment, they should be cleaned immediately and laboratory technical personnel should be informed when necessary.
18. When transporting chemicals from one place to another, they must be handled carefully and safely. When carrying chemicals, two hands should be used, one hand must be held firmly on the lid and the other on the bottom of the bottle.
19. Chemical or other materials should never be taken out of the laboratory.

SAFETY DATA SHEETS (SDS)

Many of the chemicals used in laboratories are harmful to health. Knowing the properties of the chemicals is important both for health effects and determination of what will be the first aid after an accident. Before using chemicals, Safety Data Sheet (SDS) should be carefully examined and experimental studies should be carried out according to these information.

SDS contains following information;

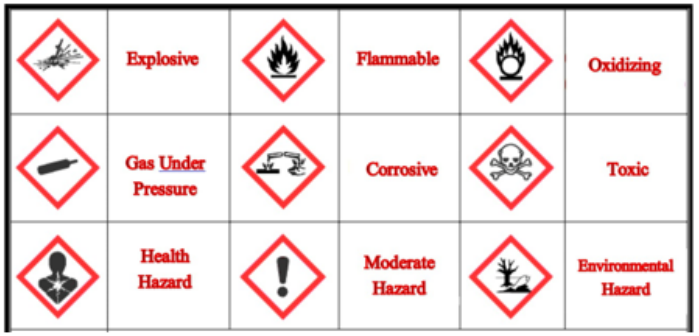
1. Name of the chemical and contents

2. Manufacturer's information
3. Hazardous ingredients/identity information
4. Physical/chemical characteristics
5. Fire and explosion hazard data
6. Health hazard data
7. First aid data
8. Storage data
9. Reactivity and stability data
10. Data about spillage and leakage
11. Ecological and toxicological characteristics
12. Special precautions
13. Special protection data
14. Transportation data
15. Disposal data
16. Data about regulations
17. Other data

Note: Safety Data Sheets are available from manufacturer's web sites:

http://www.sigmaaldrich.com/safety-center.html

Some of the most frequently seen warning symbols on chemical bottles are given below.



RULES TO BE FOLLOWED WHILE WORKING WITH GLASS MATERIAL

1. Broken glass materials should never be used. Sharp tipped glass materials should be dulled in a burner flame.
2. Do not use dirty or cracked glass.
3. Particular care should be taken to carry the long glass objects upright.
4. Glass objects such as thermometer, pipette etc. that can roll should be placed on the laboratory bench carefully to prevent them falling down.
5. The lubricant should be used before placing the apparatus such as glass pipe, thermometer etc. in the cork ring. Precautions should be taken against sudden breakage, excessive force should not be applied and gloves should be worn.
6. The hot glass material should not be placed in a cold environment or on a workbench. This may cause the glass material to crack or break. The glass should be held with tongs until cool.
7. Since it is not possible to differentiate the hot and cold glass from their appearance, the heated glass ware should not be placed in a random place without any warning.
8. Glassware should be washed with distilled water after use.
9. Broken glass materials should not be touched with bare hands. Broken glass materials should be swept off immediately and discarded carefully. Broken glass should be thrown into the "broken glass box", not into the waste bin.

RULES TO BE FOLLOWED WHILE USING A DEVICE

1. Prior to the first usage of any device in the laboratory, laboratory technical personnel should be informed and necessary information should be obtained from them and the instructions of the device should be read.
2. Pay special attention when using the burner. Hair and clothing should be kept away from burner flame.
3. Wooden tongs should be used if anything is heated in burner flame.
4. The burners or electric heaters should always be switched off when not in use.
5. In the heating or boiling process, it must be ensured that the container is not completely closed as there may be explosion due to pressure.
6. The temperature of the heating devices must not be controlled manually.

7. The current temperature setting should not be changed when using an oven or incubator. Laboratory technicians should be notified if necessary.
8. Devices such as oven and incubator should not be used with plastic gloves. Tongs should be used when working at high temperatures.
9. Equipment washed with solvents should not be placed in the oven to dry due to the risk of explosion.
10. Care should be taken to make sure that the sample containers and tongs do not touch the oven wall.
11. The precision scales must be closed and unloaded when not in use.
12. Check the balance of the precision scales. In the case of equilibrium, the bubble in the spirit level must be centered.
13. Care should be taken to eliminate the spillage of chemicals on or around the precision scale. Spilled chemicals must be cleaned with a brush.
14. Ventilation system must be operated before using fume cupboards.
15. When working with fume cupboard, the chemical materials should be placed at least 15 cm inside from the front of the fume cupboard and the glass of the fume cupboard should be kept close as much as possible.
16. The electrical connection of all devices must be done in advance when working on the fume cupboard with explosive or flammable chemicals.
17. Make sure that the hands are completely dry when connecting electrical appliances.
18. Devices should never be used if the usage directions are not fully known.

FIRST AID IN LABORATORY ACCIDENTS

Burns and Cutouts

1. In case of chemical splashes onto the skin or into the eyes, wash with plenty of water. The person exposed to the chemical should be delivered to the nearest health facility immediately.
2. Chemical burns in the laboratory should be washed with plenty of water first, clean cold water or indirect ice should be applied until the pain decreases. The person exposed to the accident should be delivered to the nearest health facility immediately according to the level of exposure.
3. In case of chemical burns such as acid burns, wash with plenty of water. If the burn is under the dress, dresses should not be attempted to be removed. The ointment / spray etc. should not be

applied to the wound. Do not touch the wound by hand. The person exposed to the accident should be delivered to the nearest health facility immediately.

4. The first thing to do when a fire comes out is to inform the authorities. In order to prevent the spread of the fire, the door must be closed and assistance should be sought. Fire extinguisher tubes are used to interfere the fire once the assistance is found. If a person is on fire, the fire blanket must be used to prevent contact with air.
5. Should not run if the clothes are on fire; should not attempt to extinguish the flame by rolling on the ground. Ask for help immediately.
6. In case of cuts or bleeding; the wound and the area is cleaned and covered with gauze bandage. Depending on the severity of the bleeding, a loose or tight buffer is used to apply pressure. The person exposed to the accident should be delivered to the nearest health facility immediately.

Irritation in eyes

1. If there is irritation in one eye only, the non-irritated eye must be protected immediately; the other eyelid should be opened and cleaned with water or eye cleaning liquid for at least 15 minutes.
2. It should be ensured that the washing process is carried out in the direction of the ears from the top of the nose in a way that the other eye is not affected and that the chemical contaminated washing water does not come back into the eye.
3. The contact lenses, if any, should be removed immediately for the effectiveness of the wash.
4. Health facilities should be contacted.

Swallowing a Chemical

The person exposed to the accident should be delivered to the nearest health facility immediately.

Breathing a Chemical

1. The area should be emptied and the exposed person should be provided with fresh air.
2. The health institution should be contacted.
3. If breathing stops (no breath sounds, no chest movement, and changing skin color), you should give artificial respiration within the time elapsed until you receive medical attention.

EMERGENCY RESPONSE PLAN		
INCIDENT	**LABORATORY WORKERS**	**LABORATORY TECHNICAL STAFF**
FIRE	- Inform the laboratory technical staff, department secretariat and other laboratory workers. - Do not interfere alone. - Remove flammable and combustible materials. - If a person is on fire, flame and air contact will be cut off by wrapping the person with fire blanket.	- For small-scale fires, use a fire extinguisher, turn off electricity and natural gas, and evacuate the laboratory. - Inform Head Of Department and Directorate of Internal Services - Call 110.
CHEMICAL SPILL	- Inform the laboratory technical staff and other laboratory workers. - Move other workers away. - Do not contact with spilled chemical, do not breathe the chemical.	- Learn the properties of spilled chemicals. - Wash with plenty of water or clean with a vacuum cleaner. - Wear protective gloves, goggles and mask when cleaning.
GAS ODOR ELECTRICAL LEAKAGE	- Inform the laboratory technical staff and other laboratory workers.	- Identify the source of gas / electric leakage - Inform Head of Department. - Switch the main breaker of the electricity leakage zone off. - If the gas leaks from the cylinder, turn it off immediately and call the Head of Department.
EARTHQUAKE	- Do not panic. - If you are near hazardous chemicals, move away immediately. - Bend over near to bench, table etc. close to you that have center of gravity near to surface, place your arms on your head, and wait by placing your head down between to your legs.	- Apart from what must be done next, after the quake ends; evacuate the workers in the laboratory.

Giving the form to the technical staff

PATH TO BE FOLLOWED FOR THE USE OF THE LABORATORY IN THE PROCESS OF STARTING AND COMPLETING THE MASTERS'S AND PH.D. STUDIES

1. The student who will work in the laboratory must get the approval of the Laboratory Manager and the Head of the Department within the knowledge of his / her Advisor.
2. Getting laboratory keys is not part of the natural procedure. It may be possible to obtain the keys only if the student will work out of working hours during the weekdays or at weekends, after the requirement is documented by the student, by the assessment of the Head of the Department. For this purpose, the student who will start to work in the laboratory must first take the 'Laboratory Usage Permission Form' from the Department Administrative Office and after completion the necessary signatures, the student must submit the form to the Administrative Office.
3. Unauthorized reproduction of laboratory keys is strictly prohibited.
4. The students who will work in the laboratory should consult with the Laboratory Technical Staff and obtain the necessary information and forms (Laboratory Safety and Working Rules).
5. During the thesis studies, if there is a cabinet request to place the materials in the laboratory where the students are allowed to work, they should consult with the Laboratory Technical Staff.
6. During the thesis studies, students should be labeled the names of the cabinets and materials they use. The materials like unlabeled bottles etc. will be discarded during routine cleaning.
7. During the thesis studies, permission must be taken from the Head of the Department for the instruments and laboratories that are not in general usage. If the device has been taken within the scope of a project and is not available for routine use, permission must be obtained from the relevant instructor.
8. After completion of the laboratory work, it is necessary to empty the cabinets and inform the Laboratory Technical Staff. These procedures must be completed within one week after the thesis defense. 'Discharge Certificate' must be obtained from the department secretariat and delivered to the secretariat after the necessary signatures have been completed.

Laboratory Managers: *Anaerobic Lab. (Prof. Dr. Tuba Hande Ergüder Bayramoğlu), *Unit Lab. (Prof. Dr. Ülkü Yetiş) *Pollution Hydrology Lab. (Prof. Dr. İpek İmamoğlu)* Microbiology Lab. (Z-16 and Z-18) (Prof. Dr. Bülent İçgen) *Air Lab. (Assoc. Prof. Dr. Yasemin Dilsad Yılmazel Tokel) *Chemistry Lab. (Prof. Dr. Dilek Sanin)

IMPORTANT PHONE NUMBERS

Laboratory Technical Staff: (Office: Z-35)

Melek Özdemir, Mehmet Hamgül, Esra Gül **Internal telephone:** 0312 210 2640

Head of Department phone number: 0312 210 2641

Duty Officer Tel No: 0312 210 2113 and/or 0312 210 2114

AMBULANCA CALLING: 210 4142 (for METU internal ambulance calling).

FIRST AID CONSULTING: 210 4960 (This phone number is used for counseling and information about first aid.)

Fire Brigade: 110

Ambulance: 112

I have read the document named "Laboratory Safety and Working Rules" which is prepared for our safety and I have understood the rules. I agree to abide by all the rules. I declare that if I fail to comply with the rules, I take the responsibility and I accept that I can be removed from the laboratory.

……/……/20…..

Name – Surname:

Phone number: e-mail address: Signature:

Mobile phone number:

Laboratories in which to work:

□ Chemistry Lab. □ Unit Lab. □ Microbiology Lab. (Z-16) □ Microbiology Lab. (Z-18)
□ Anaerobic Lab. □ Air Lab. □ Clean Room □ Pollution Hydrology Lab. □ Hot Room

Advisor Approval:

"**Laboratory Permission Form**" obtained from the Department Administration should be given back to Administration after the necessary signatures are collected.

ODTÜ ÇEVRE MÜHENDİSLİĞİ BÖLÜMÜ LABORATUVAR KULLANIM İZİN FORMU

1) Bu kısım anahtar almak isteyen öğrenci/personel tarafından doldurulacaktır.

Bölümümüz;
- ☐ Atomik Absorpsiyon Laboratuvarı - 1
- ☐ Atomik Absorpsiyon Laboratuvarı - 2
- ☐ FTIR-AOX Laboratuvarı
- ☐ Hava Laboratuvarı
- ☐ Kimya Laboratuvarı
- ☐ Kirlilik Hidrolojisi Laboratuvarı
- ☐ Mikrobiyoloji Laboratuvarı - 1
- ☐ Mikrobiyoloji Laboratuvarı - 2
- ☐ Sıcak Oda
- ☐ Temel İşlemler Laboratuvarı
- ☐ Temiz Oda
- ☐ TÜRKAK Laboratuvarı

Laboratuvar/laboratuvarlarında mesai saatleri haricinde çalışmam gerekmektedir. Bana verilen, laboratuvarda çalışma kurallarını, güvenlik ve yangın talimatlarını okudum; yangın söndürme cihazlarının ve doğal gaz vanalarının yerini öğrendim. Aşağıda belirttiğim saatlerde ve bildirdiğim cihazları kullanarak çalışacağımı, bu koşullarda bir değişiklik olması durumunda laboratuvar teknik personelini haberdar edeceğimi; cihazların yanlış ve/veya tehlikeli kullanımından kaçınacağımı; laboratuvarda çalışma kurallarına uyacağımı beyan ederim.

Çalışma Saatleri:
- ☐ Hafta içi 17:30'dan sonra
- ☐ Cumartesi
- ☐ Pazar

Tahmini Çalışma Başlangıç Tarihi:
Bitiş Tarihi:

Kullanacağı Cihazlar:

Adı ve Soyadı:
Cep Telefonu:
Tarih:
İmza:
Öğrenci Danışmanı (Ad/Soyad/İmza)

2) Bu kısım Bölüm Başkanı ve Laboratuvar Yöneticisi tarafından doldurulacaktır.

Öğrencinin/personelin laboratuvarda çalışma talebi uygundur.

	Laboratuvar Yöneticisi	İmza
☐ Atomik Absorpsiyon Laboratuvarı		
☐ FTIR-AOX Laboratuvarı		
☐ Hava Laboratuvarı		
☐ Kimya Laboratuvarı		
☐ Kirlilik Hidrolojisi Laboratuvarı		
☐ Mikrobiyoloji Laboratuvarı		
☐ Sıcak Oda		
☐ Temel İşlemler Laboratuvarı		
☐ Temiz Oda		
☐ TÜRKAK Laboratuvarı		

Bölüm Başkanı	İmza

3) Bu kısım Laboratuvar Teknik Personeli tarafından doldurulacaktır.

Öğrenci/personel "Laboratuvar Güvenliği ve Çalışma Kuralları"nı okumuş; ilgili teknik bilgi, uyarı ve talimatları almıştır.

	Laboratuvar Teknik Personeli	İmza
☐ Atomik Absorpsiyon Laboratuvarı		
☐ FTIR-AOX Laboratuvarı		
☐ Hava Laboratuvarı		
☐ Kimya Laboratuvarı		
☐ Kirlilik Hidrolojisi Laboratuvarı		
☐ Mikrobiyoloji Laboratuvarı		
☐ Sıcak Oda		
☐ Temel İşlemler Laboratuvarı		
☐ Temiz Oda		
☐ TÜRKAK Laboratuvarı		

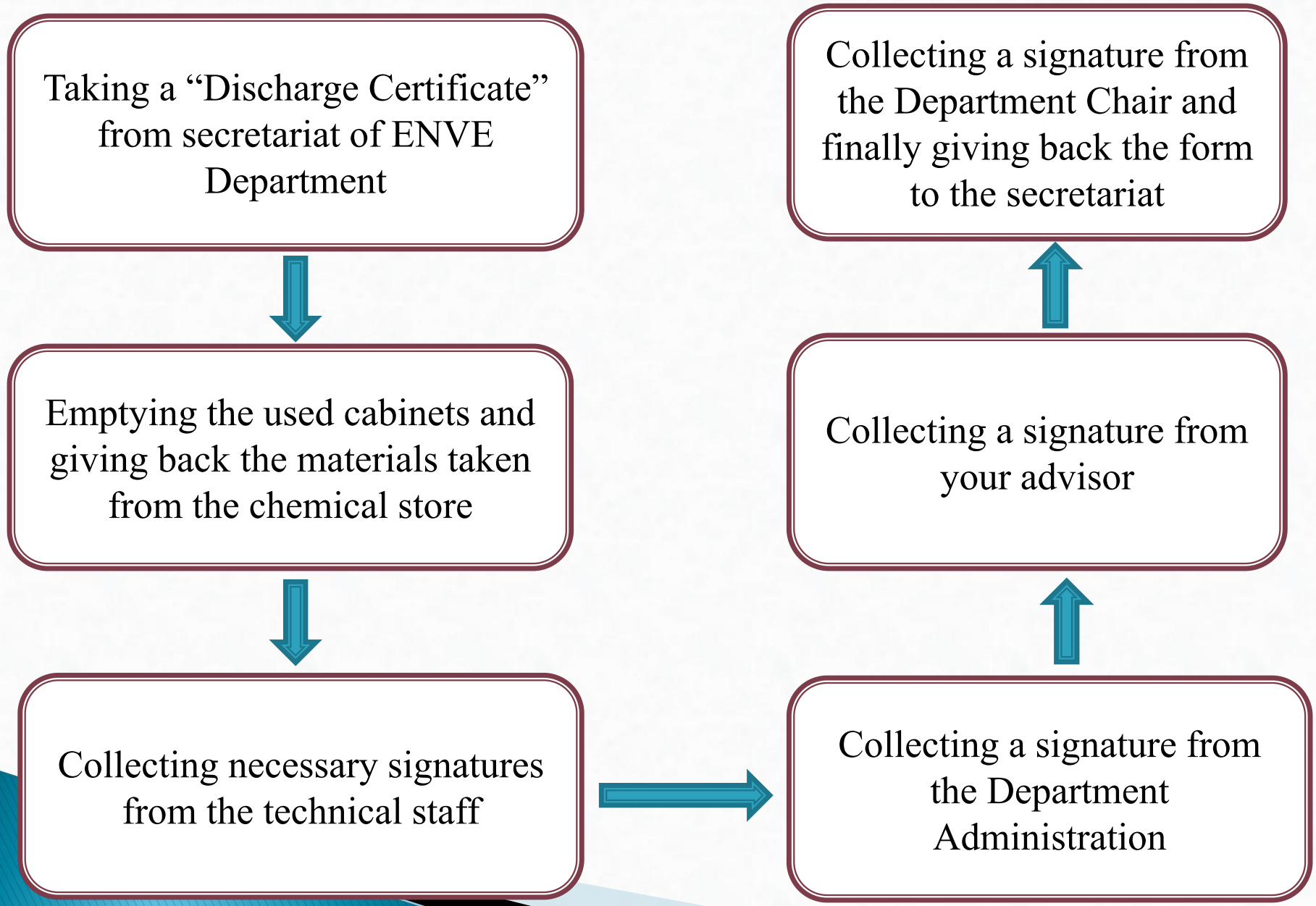
4) Bu kısım öğrenci/personel ve Bölüm İdare Amiri tarafından doldurulacaktır.

Bölüm laboratuvar/laboratuvarlarında mesai saatleri haricinde çalışma yapmak üzere anahtar/anahtarlar teslim edilmiştir.

	Teslim Eden	İmza
☐ Atomik Absorpsiyon Laboratuvarı		
☐ FTIR-AOX Laboratuvarı		
☐ Hava Laboratuvarı		
☐ Kimya Laboratuvarı		
☐ Kirlilik Hidrolojisi Laboratuvarı		
☐ Mikrobiyoloji Laboratuvarı		
☐ Sıcak Oda		
☐ Temel İşlemler Laboratuvarı		
☐ Temiz Oda		
☐ TÜRKAK Laboratuvarı		

Teslim Alan	İmza

The procedure to be followed when the students finish their researches



ODTÜ ÇEVRE MÜHENDİSLİĞİ BÖLÜM BAŞKANLIĞI'NA

☐ Yüksek Lisans/Doktora tez çalışmalarım süresince kullanmış olduğum ve bölüme ait her türlü malzeme, cihaz, dolap, bilgisayar ve anahtarları eksiksiz bir şekilde teslim ettiğimi, çalışmalarım sonucu ortaya çıkan atıkları bertaraf ettiğimi ve mesai saatleri dışında bölüme giriş çıkışlarda kullandığım kapı giriş izinlerini iptal ettirdiğimi bilgilerinize arz ederim.

☐ Yüksek Lisans tez çalışmalarımı tamamlanmış olmakla birlikte Doktora tez çalışmalarıma bölümde devam edeceğimi bilgilerinize arz ederim.

☐ Yüksek Lisans/Doktora tez çalışmalarım tamamlanmış olmakla birlikte, bölümdeki çalışmalarım ..... (gün/ay) daha devam edecek olup, çalışmalarım tamamlandığında kullanmış olduğum ve bölüme ait her türlü malzeme, cihaz, dolap, bilgisayar ve anahtarları eksiksiz bir şekilde teslim edeceğimi, çalışmalarım sonucu ortaya çıkan atıkları bertaraf edeceğimi ve mesai saatleri dışında bölüme giriş çıkışlarda kullandığım kapı giriş izinlerini iptal ettireceğimi bilgilerinize arz ederim.

Adı ve Soyadı: Tarih:

Cep Telefonu: İmza:

İLİŞİĞİ BULUNMADIĞINI BİLDİREN SORUMLULAR

	Lab Sorumlusu Teknisyen	Açıklamalar	İmza
☐ Malzemeler			
☐ Cihazlar			
☐ Dolaplar			
☐ Atıklar			

	Bölüm Bilgisayar Sorumlusu	Açıklamalar	İmza
☐ Bilgisayar			

	Bölüm Giriş İzin ve Anahtar Sorumlusu	Açıklamalar	İmza
☐ Kapı Giriş İzni			
☐ Anahtarlar			

Öğrenci Danışmanı
(Ad/Soyad/İmza)

Bölüm Başkanı
(Ad/Soyad/İmza)

Personal protections in laboratories







It is important to know the potential hazards we may encounter and take appropriate safety protections before start to work in laboratories.

- **What are the potential hazards?**
- **What are the personal protections and actions to be taken to minimize risks?**






- **ALWAYS** lab coats should be worn when working in the labs

- Eye and skin protective equipment such as glasses, face mask, gloves should be used according to the characteristics of the study.


You only have
one pair of eyes!
Protect them

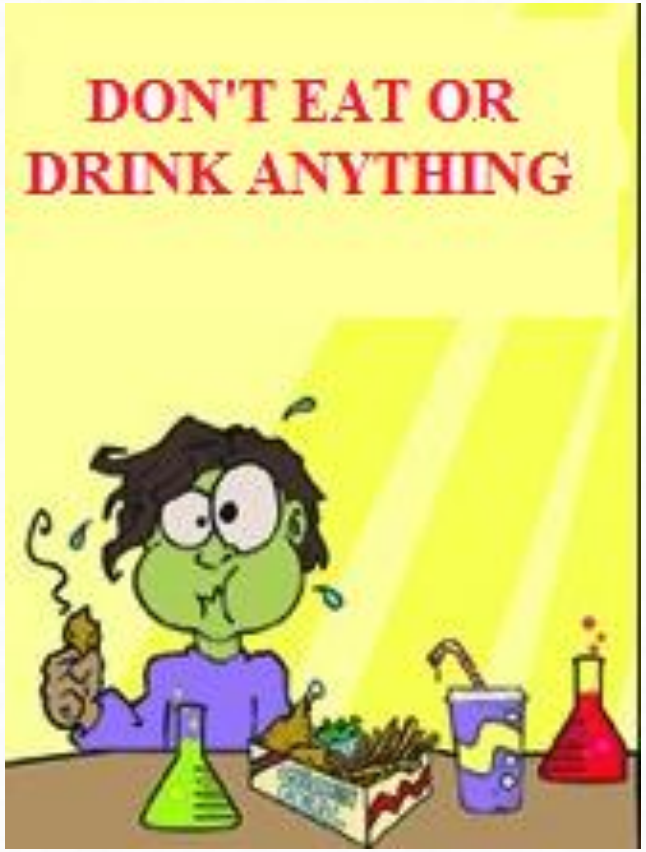
Gloves

Examine the SDS forms of chemicals

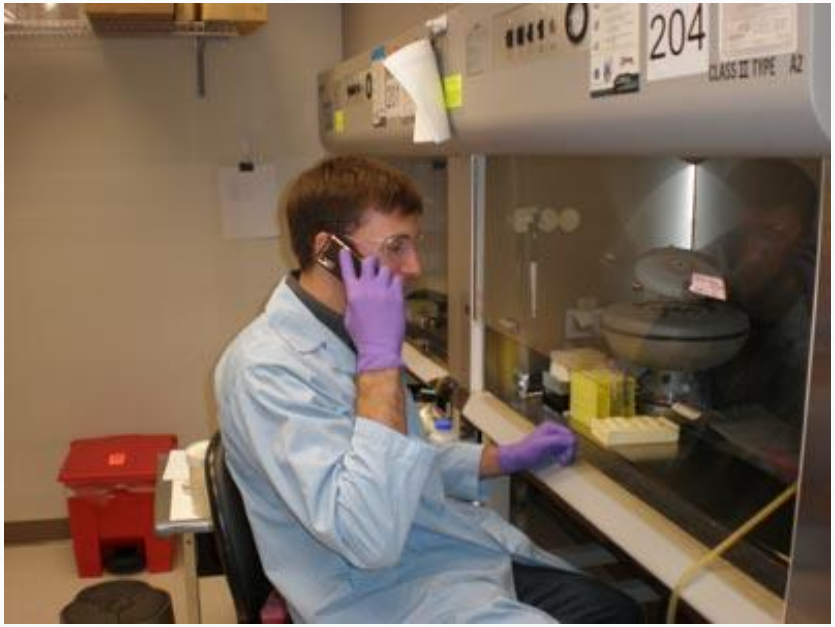
- Avoid wearing shorts, skirts etc.

- Shoes that cover the entire foot (top of foot, toes and heel included) must be worn in the lab.
- Don’t wear sandals or open shoes

- Avoid eating, drinking or gum chewing in a laboratory



- Do not use mobile phone

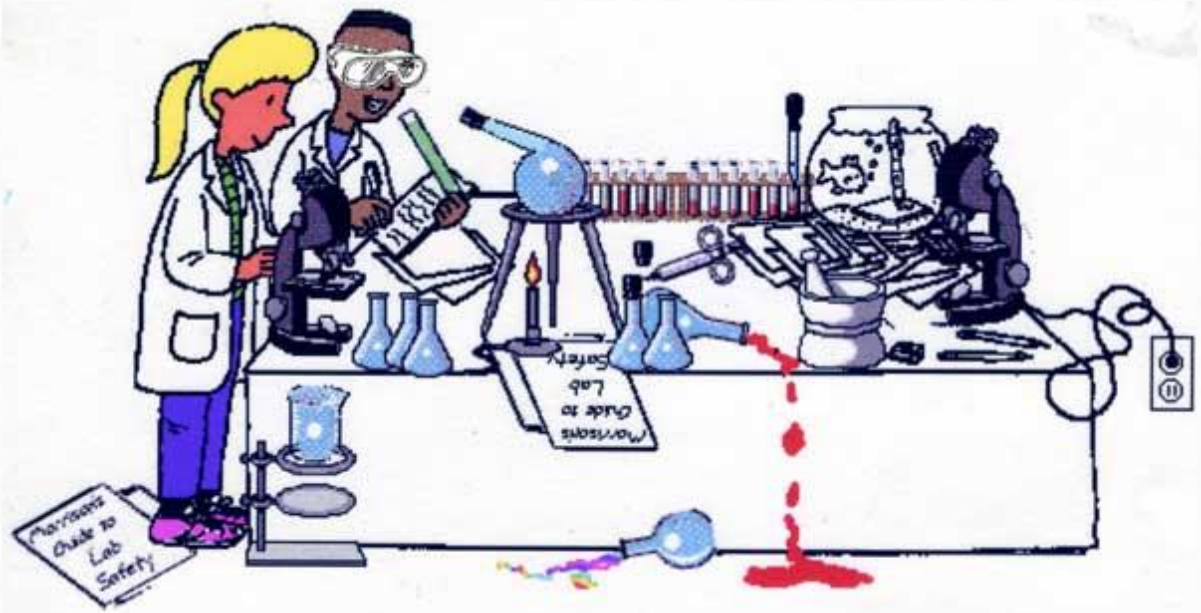


- Do not use headphones & earphones

- Do not disturb others while working in laboratory

- No dangerous jokes should be made

- The workplace should be kept tidy and clean.



- Gas valves, lights, ventilation and air conditioning must be turned off.

- Wash your hands thoroughly with soap and water before leaving the lab.

CHEMICALS

Dane Neuberger, a ninth grader in Minnesota who was one of four students burned in a science demonstration involving methanol. "My face was actually on fire," he told local media. Photograph: RICHARD TSONG TAATARII/Minneapolis Start Tribune (https://www.nfpa.org/unsafe_science)

An explosion occurred in a fume hood when a researcher mixed the waste products of nitric acid and ethanol. The lid of the waste container was capped and the bottle over pressurized and exploded almost immediately. The researcher was wearing safety glasses and a lab coat. However, the fume hood sash was above the working height as indicated by the yellow sticker. If the sash had been placed at the correct working height, the burns and lacerations that the researcher received would have been reduced.

(https://ehs.uky.edu/ohs/incompatibles_explosion.html)

Chemical Safety

- All chemicals must be considered as '**DANGEROUS**'.
- Be careful when moving chemicals!
- Keep chemicals tightly closed when storing them.

- Do not touch the chemicals with bare hands.
- Do not taste or smell any chemicals

- Work in a fume hood whenever using acids, volatile organic chemicals and smelly substances such as wastewater, sludge, etc.

Safety data sheets (SDS) of chemicals should be examined carefully.

OSHA® QUICKCARD™

Hazard Communication Safety Data Sheets

The Hazard Communication Standard (HCS) requires chemical manufacturers, distributors, or importers to provide Safety Data Sheets (SDSs) (formerly known as Material Safety Data Sheets or MSDSs) to communicate the hazards of hazardous chemical products. As of June 1, 2015, the HCS will require new SDSs to be in a uniform format, and include the section numbers, the headings, and associated information under the headings below:

Section 1, Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.

Section 2, Hazard(s) identification includes all hazards regarding the chemical; required label elements.

Section 3, Composition/information on ingredients includes information on chemical ingredients; trade secret claims.

Section 4, First-aid measures includes important symptoms/effects, acute, delayed; required treatment.

Section 5, Fire-fighting measures lists suitable extinguishing techniques, equipment; chemical hazards from fire.

Section 6, Accidental release measures lists emergency procedures; protective equipment; proper methods of containment and cleanup.

Section 7, Handling and storage lists precautions for safe handling and storage, including incompatibilities.

Section 8, Exposure controls/personal protection lists OSHA's Permissible Exposure Limits (PELs); ACGIH Threshold Limit Values (TLVs); and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the SDS where available as well as appropriate engineering controls; personal protective equipment (PPE).

Section 9, Physical and chemical properties lists the chemical's characteristics.

Section 10, Stability and reactivity lists chemical stability and possibility of hazardous reactions.

Section 11, Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.

Section 12, Ecological information*
Section 13, Disposal considerations*
Section 14, Transport information*
Section 15, Regulatory information*

Section 16, Other information, includes the date of preparation or last revision.

*Note: Since other Agencies regulate this information, OSHA will not be enforcing Sections 12 through 15 (29 CFR 1910.1200(g)(2)).

Employers must ensure that SDSs are readily accessible to employees.

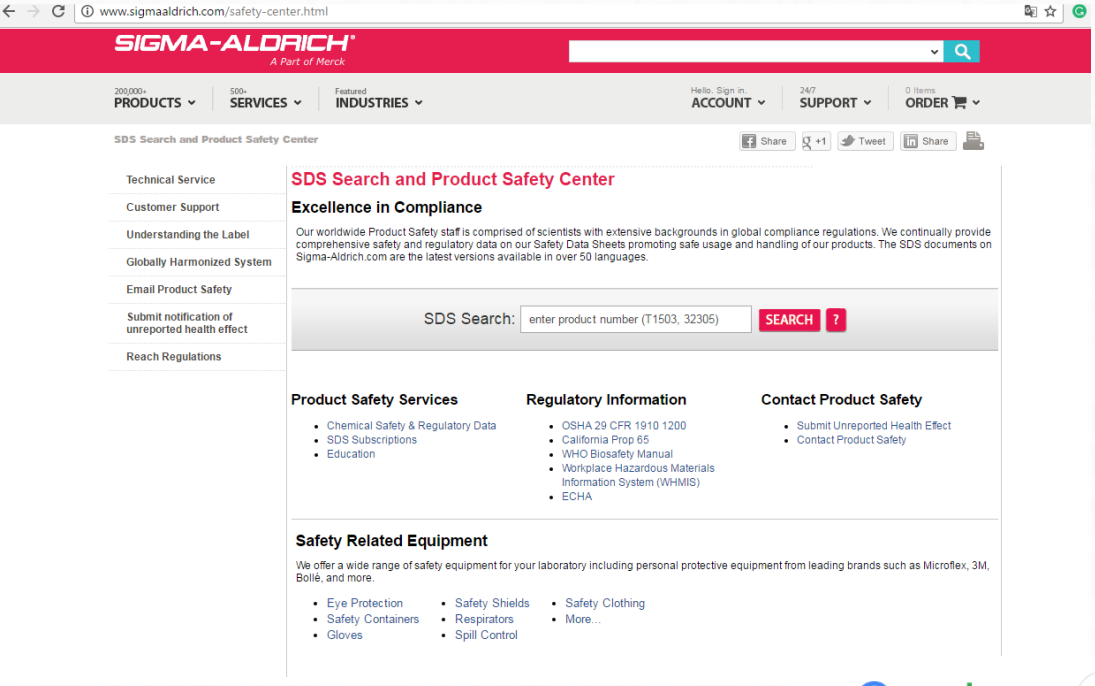
See Appendix D of 1910.1200 for a detailed description of SDS contents.

For more information:

U.S. Department of Labor

OSHA® Occupational Safety and Health Administration

www.osha.gov (800) 321-OSHA (6742)



sigmaaldrich.com
https://www.sigmaaldrich.com › sds › sial PDF

SAFETY DATA SHEET - Sigma-Aldrich

7 Şub 2023 — **Ethyl Alcohol**, pure ... 1.3 Details of the supplier of the **safety data sheet**. Company ... **ethanol**. Flam. Liq. 2; Eye Irrit. 2A;. H225, H319.

fishersci.com
https://www.fishersci.com › msdsproxy?product... PDF

Ethanol - SAFETY DATA SHEET

SAFETY DATA SHEET. Creation Date 09-Jul-2009. Revision Date 07-Jan-2022. Revision Number 7. 1. Identification. Product Name. **Ethanol**, Anhydrous ...

https://beta-static.fishersci.com › chemicals-e PDF

Ethanol - Safety Data Sheet

19 Mar 2015 — Hazard statements: Highly flammable liquid and vapour. Toxic if swallowed. May cause drowsiness or dizziness. May damage fertility or the unborn ...

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006
Version 6.2 Revision Date 06.02.2017
Print Date 21.02.2019
GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO OEL DATA

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

1.1 Product identifiers

Product name : Methanol

Product Number : 34860
Brand : SIGALD
Index-No. : 603-001-00-X
REACH No. : 01-2119433307-44-XXXX
CAS-No. : 67-56-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Chemie GmbH
Eschenstrasse 5
D-82024 TAUFKIRCHEN

Telephone : +49 (0)89 6513-1130
Fax : +49 (0)89 6513-1161

1.4 Emergency telephone number

Emergency Phone # : 0800 181 7059 (CHEMTREC Deutschland)
+49 (0)696 43508409 (CHEMTREC weltweit)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008
Flammable liquids (Category 2), H225
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Inhalation (Category 3), H331
Acute toxicity, Dermal (Category 3), H311
Specific target organ toxicity - single exposure (Category 1), H370

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008
Pictogram

Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H301 + H311 + H331 Toxic if swallowed, in contact with skin or if inhaled.
H370 Causes damage to organs.

Precautionary statement(s)
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280 Wear protective gloves/ protective clothing.
P302 + P352 + P312 IF ON SKIN: Wash with plenty of water.Call a POISON CENTER/doctor if you feel unwell.
P304 + P340 + P311 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor.
P370 + P378 In case of fire: Use dry powder or dry sand to extinguish.
P403 + P235 Store in a well-ventilated place. Keep cool.

Supplemental Hazard Statements none

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms : Methyl alcohol

Formula : CH<SB>4</>O
Molecular weight : 32.04 g/mol
CAS-No. : 67-56-1
EC-No. : 200-659-6
Index-No. : 603-001-00-X
Registration number : 01-2119433307-44-XXXX

Hazardous ingredients according to Regulation (EC) No 1272/2008

Component		Classification	Concentration
Methanol			
CAS-No.	67-56-1	Flam. Liq. 2; Acute Tox. 3; STOT SE 1; H225, H301, H331, H311, H370 Concentration limits: >= 10 %: STOT SE 1, H370; 3 - < 10 %: STOT SE 2, H371;	<= 100 %
EC-No.	200-659-6		
Index-No.	603-001-00-X		
Registration number	01-2119433307-44-XXXX		

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

Notes to physician
Dizziness Drowsiness metabolic acidosis Blurred vision Seizures. Coma Blindness death

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Dry powder Dry sand

Unsuitable extinguishing media
Do NOT use water jet.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in a cool, well-ventilated place.
Storage class (TRGS 510): Flammable liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Derived No Effect Level (DNEL)

Application Area	Exposure routes	Health effect	Value
Workers	Skin contact	Long-term systemic effects	40mg/kg BW/d
Consumers	Skin contact	Long-term systemic effects	8mg/kg BW/d
Consumers	Ingestion	Long-term systemic effects	8mg/kg BW/d
Workers	Skin contact	Acute systemic effects	40mg/kg BW/d
Consumers	Skin contact	Acute systemic effects	8mg/kg BW/d
Consumers	Ingestion	Acute systemic effects	8mg/kg BW/d
Workers	Inhalation	Acute systemic effects	260 mg/m3
Workers	Inhalation	Acute local effects	260 mg/m3
Workers	Inhalation	Long-term systemic effects	260 mg/m3
Workers	Inhalation	Long-term local effects	260 mg/m3
Consumers	Inhalation	Acute systemic effects	50 mg/m3
Consumers	Inhalation	Acute local effects	50 mg/m3
Consumers	Inhalation	Long-term systemic effects	50 mg/m3
Consumers	Inhalation	Long-term local effects	50 mg/m3

Predicted No Effect Concentration (PNEC)

Compartment	Value
Soil	23.5 mg/kg
Marine water	15.4 mg/l
Fresh water	154 mg/l
Fresh water sediment	570.4 mg/kg
Onsite sewage treatment plant	100 mg/kg

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Full contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 31 min

Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industria situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engine protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: colourless
b)	Odour	pungent
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -98 °C
f)	Initial boiling point and boiling range	64.7 °C
g)	Flash point	9.7 °C - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 36 %(V) Lower explosion limit: 6 %(V)
k)	Vapour pressure	97.7 mmHg at 20.0 °C 410.0 mmHg at 50.0 °C 169.27 hPa at 25.0 °C
l)	Vapour density	1.11
m)	Relative density	0.791 g/mL at 25 °C
n)	Water solubility	completely miscible
o)	Partition coefficient: n-octanol/water	log Pow: -0.77
p)	Auto-ignition temperature	455.0 °C at 1,013 hPa
q)	Decomposition temperature	No data available
r)	Viscosity	No data available

s)	Explosive properties	Not explosive
t)	Oxidizing properties	The substance or mixture is not classified as oxidizing.

9.2 Other safety information

Minimum ignition energy	0.14 mJ
Conductivity	< 1 µS/cm
Relative vapour density	1.11

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Acid chlorides, Acid anhydrides, Oxidizing agents, Alkali metals, Reducing agents, Acids

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LDLO Oral - Human - 143 mg/kg(Methanol)
Remarks: Lungs, Thorax, or Respiration:Dyspnea. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.
LD50 Oral - Rat - 1,187 - 2,769 mg/kg(Methanol)
LC50 Inhalation - Rat - 4 h - 128.2 mg/l(Methanol)
LC50 Inhalation - Rat - 6 h - 87.6 mg/l(Methanol)
LD50 Dermal - Rabbit - 17,100 mg/kg(Methanol)

Skin corrosion/irritation
Skin - Rabbit(Methanol)
Result: No skin irritation

Serious eye damage/eye irritation
Eyes - Rabbit(Methanol)
Result: No eye irritation

Respiratory or skin sensitisation
Maximisation Test - Guinea pig(Methanol)
Does not cause skin sensitisation.
(OECD Test Guideline 406)

Germ cell mutagenicity

Ames test(Methanol)
S. typhimurium
Result: negative
in vitro assay(Methanol)
fibroblast
Result: negative
Mutation in mammalian somatic cells.
Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)(Methanol)
Mouse - male and female
Result: negative

Carcinogenicity
Carcinogenicity- Rat- Inhalation(Methanol)

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity
Damage to fetus not classifiable(Methanol)

Fertility classification not possible from current data.(Methanol)

Specific target organ toxicity - single exposure
Causes damage to organs.(Methanol)

Specific target organ toxicity - repeated exposure
The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard
No aspiration toxicity classification(Methanol)

Additional Information
RTECS: PC1400000

Effects due to ingestion may include:, Headache, Dizziness, Drowsiness, metabolic acidosis, Coma, Seizures., Methyl alcohol may be fatal or cause blindness if swallowed.(Methanol)
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.(Methanol)

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	mortality LC50 - Lepomis macrochirus (Bluegill) - 15,400.0 mg/l - 96 h(Methanol)
	NOEC - Oryzias latipes - 7,900 mg/l - 200 h(Methanol)
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - > 10,000.00 mg/l - 48 h(Methanol)
Toxicity to algae	Growth inhibition EC50 - Scenedesmus capricornutum (fresh water algae) - 22,000.0 mg/l - 96 h(Methanol)

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 5 d(Methanol) Result: 72 % - rapidly biodegradable
Biochemical Oxygen Demand (BOD)	600 - 1,120 mg/g(Methanol)
Chemical Oxygen Demand (COD)	1,420 mg/g(Methanol)

Theoretical oxygen demand	1,500 mg/g(Methanol)

12.3 Bioaccumulative potential

Bioaccumulation	Cyprinus carpio (Carp) - 72 d at 20 °C - 5 mg/l(Methanol) Bioconcentration factor (BCF): 1.0

12.4 Mobility in soil
Will not adsorb on soil.(Methanol)

12.5 Results of PBT and vPvB assessment
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

Additional ecological information	Avoid release to the environment.
Stability in water	at 19 °C83 - 91 % - 72 h(Methanol) Remarks: Hydrolyses on contact with water.Hydrolyses readily.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the Directive on waste 2008/98/EC as well as other national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. Offer surplus and non-recyclable solutions to a licensed disposal company. Burn in a chemical incinerator equipped with an afterburner and scrubber b highly flammable.

Contaminated packaging
Dispose of as unused product.

SECTION 14: Transport information

14.1 UN number

ADR/RID: 1230	IMDG: 1230	IATA: 1230

14.2 UN proper shipping name

ADR/RID:	METHANOL
IMDG:	METHANOL
IATA:	Methanol

14.3 Transport hazard class(es)

ADR/RID: 3 (6.1)	IMDG: 3 (6.1)	IATA: 3 (6.1)

14.4 Packaging group

ADR/RID: II	IMDG: II	IATA: II

14.5 Environmental hazards

ADR/RID: no	IMDG Marine pollutant: no	IATA: no

14.6 Special precautions for user
No data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

15.2 Chemical safety assessment
A Chemical Safety Assessment has been carried out for this substance.

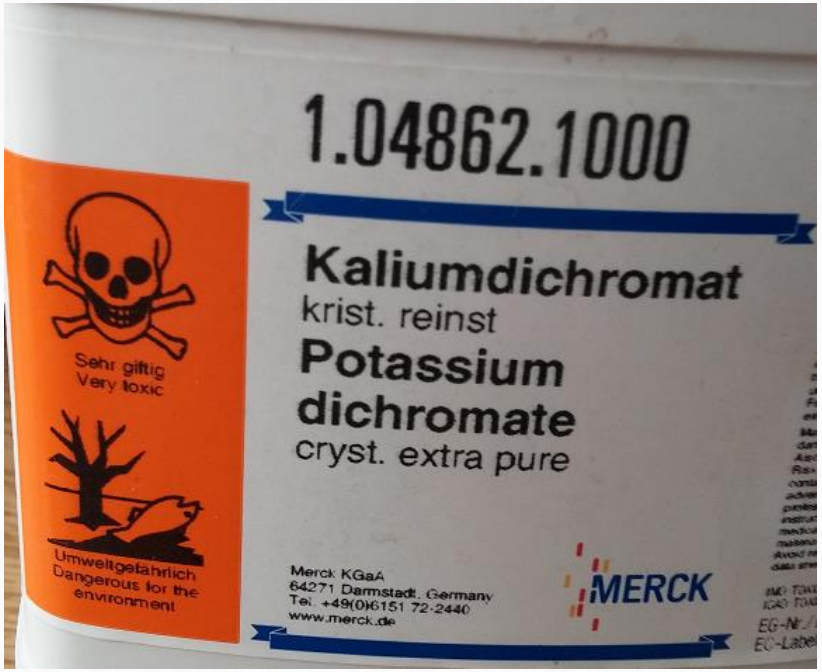
SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

H225	Highly flammable liquid and vapour.
H301	Toxic if swallowed.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled.
H311	Toxic in contact with skin.
H331	Toxic if inhaled.
H370	Causes damage to organs.
H371	May cause damage to organs.

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.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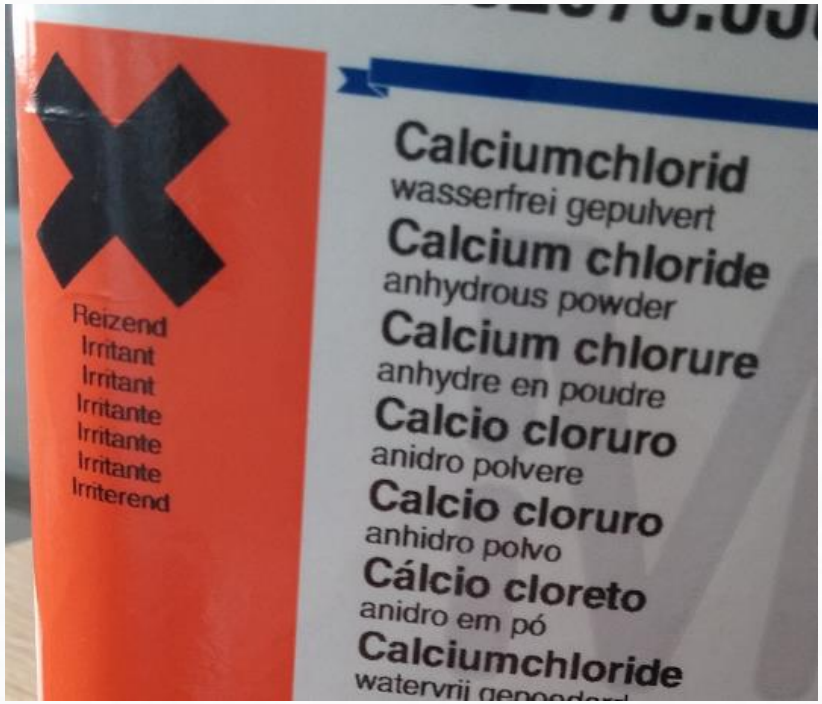
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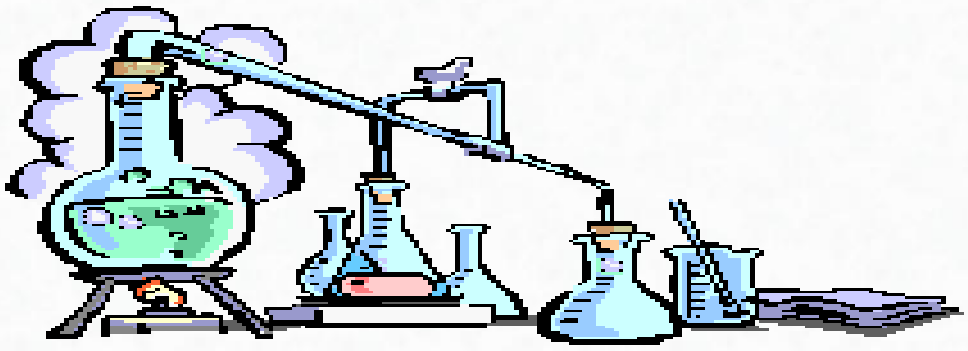
Calciumchloride

What do the COSHH symbols mean?

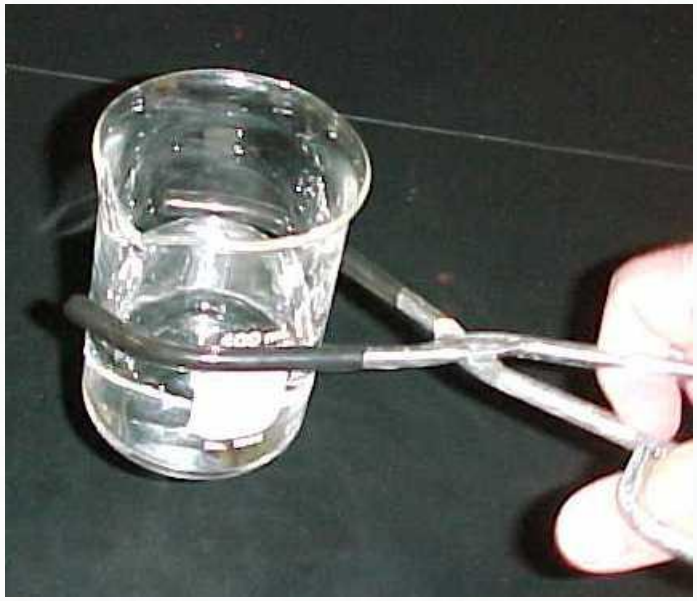
 Dangerous to the environment	 Toxic	 Gas under pressure
 Corrosive	 Explosive	 Flammable
 Caution – used for less serious health hazards like skin irritation	 Oxidising	 Longer term health hazards such as carcinogenicity

Glassware



- Do not use chipped, cracked or broken glassware.
- Do not pick up broken glass with bare or unprotected hands. Use a brush and dustpan to clean up broken glass.
- Broken glass should be thrown into the “broken glass box”, not into the waste bin.

Use heat resistant gloves or metal tongs to move hot glassware.



USE AND TRANSPORT OF GAS CYLINDERS

Compressed gas cylinders can present a variety of hazards due to their pressure and content. Improper handling of compressed gas cylinders can result in several accidents such as fire, explosion, chemical burns, poisoning, and cold burns.

Acetylene cylinder-related damage

https://dmse.mit.edu/sites/default/files/imce/research/safety/Gas_Cylinder_Safety.pdf

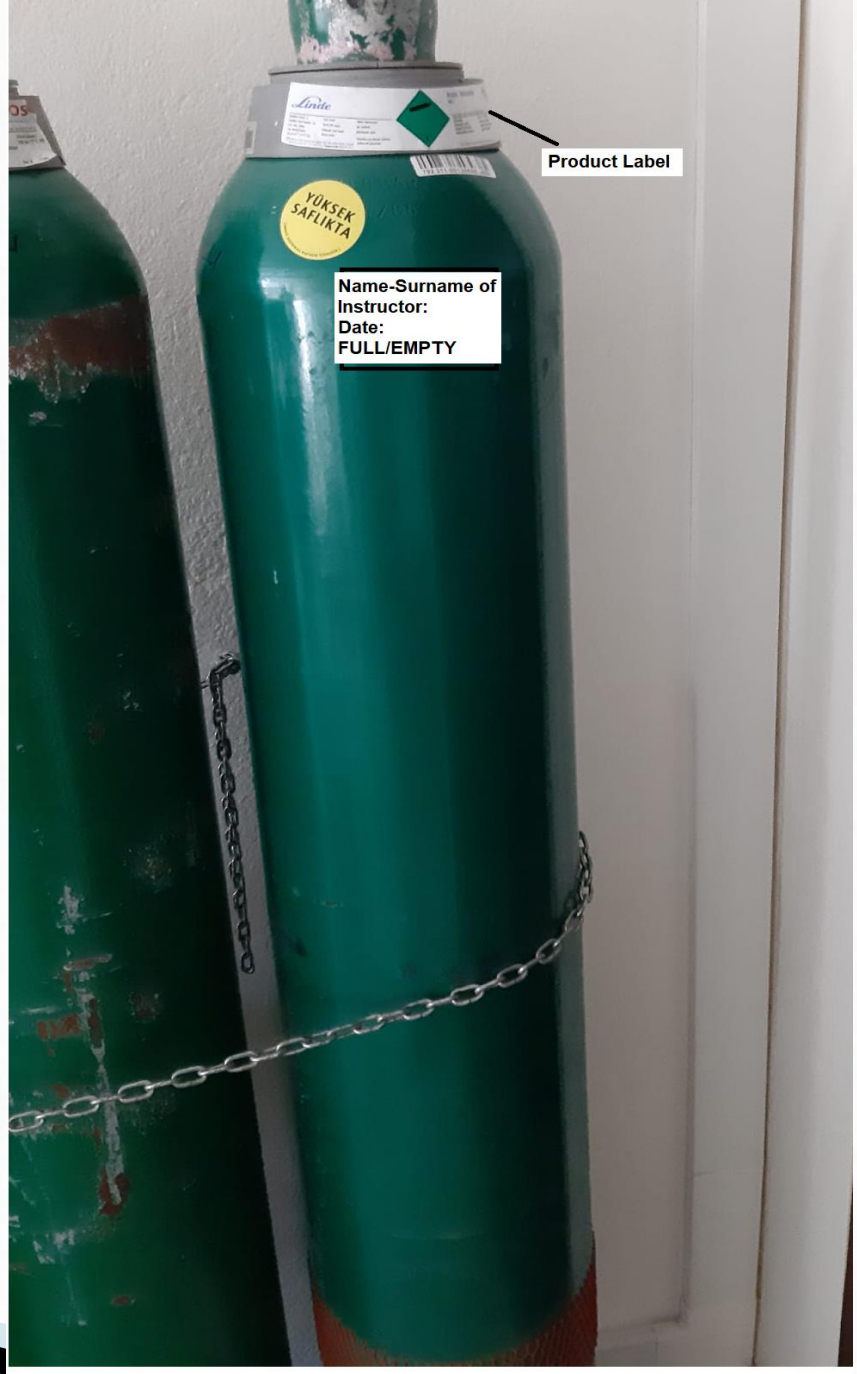
Example: 2010 - Missouri

- Lab using hydrogen gas; gas leak led to explosion
- 4 injured, lab destroyed

https://dmse.mit.edu/sites/default/files/imce/research/safety/Gas_Cylinder_Safety.pdf

Thus, the following precautions should be taken to prevent accidents caused by the improper handling of compressed gas cylinders.

- The properties, use, and safety precautions before using any gas or gas mixture should be examined.
- The cylinders should not be dragged, dropped, or struck each other violently.
- The cylinders should not be subjected to mechanical shocks that may cause damage to their valves.
- The product labels or shipping hazard labels of cylinders should not be removed.
- The cylinders should be moved using a suitable hand truck or cart.


Product Label
YÜKSEK SAFLIKTA
Name-Surname of Instructor:
Date:
FULL/EMPTY

- The cylinders should be fastened to the wall with a chain when in storage or use.

- When returning cylinders to the supplier, the cylinder valve should be properly closed, valve outlet seals should be replaced and secured, and the cylinder cap should be properly installed.

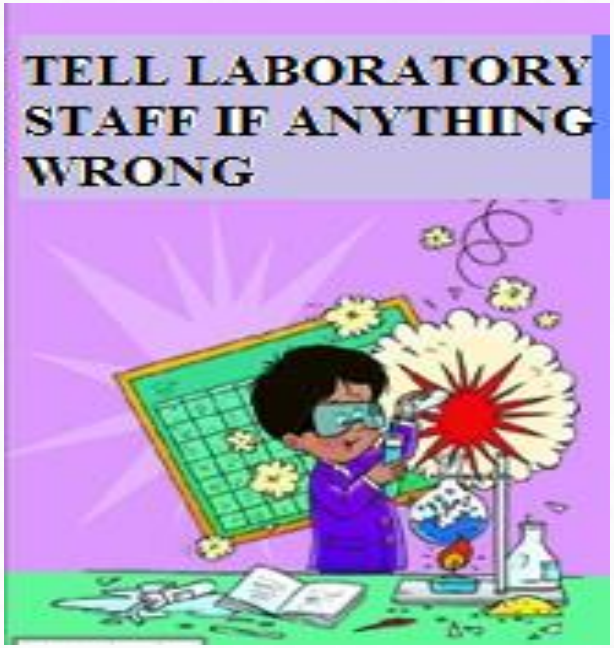
LABORATORY DEVICES

GENERAL RULES

- The location of experimental apparatus and equipments should not be replaced.
- Necessary permissions must be taken before using the devices in the laboratory.
- The operating instructions for the devices must be carefully examined and used in accordance with the instructions.

GENERAL RULES

- The necessary information about the usage of the devices should be obtained from laboratory technical personnel.
- Any unusual situations occurring when working with the devices, should be reported to laboratory technical personnel as soon as possible.



In the lab, each device has a '**logbook**' near them. The analyst should fill these log books for their each usage.

- **Number of samples:**
- **Working conditions:**
- **Date:**
- **Working Time zone:**
- **Name surname:**
- **Signature:**

The devices should be cleaned and closed according to their user guides.

DEVICES IN COMMON USAGE

REFRIGERATORS

- All samples in the refrigerators should be labeled.
- On the label;
  - Name of the chemical (solution):
  - Date of preparation:
  - Prepared by
  - Name and surname :
- Do not forget to take your samples when you finish your experiments.

WATER-BATH

- Use pure water for water tank and make sure that the device has been unplugged after use. Otherwise, overheating of water in the water tank may cause fire.

SPECTROPHOMETER

TURBIDITYMETER

- The users should be careful not to spill the sample into the device.
- The samples should not be forgotten in the devices and the device should be switched off after usage.

FUME HOODS

- The device can be operated from the on / off button located on the front of the device.
- At the end of the usage, clean any spilled chemicals into the fume hood.
- It should not be used for chemical storage.

ANALYTICAL BALANCES

- Before using the balance check that the air bubble is in the center of the level indicator.
- The device should be left clean.

INCUBATOR

ASH FURNACE

- A notepaper which contain name and contact information of the user should be attached to the device.
- When placing the new sample to the device, the location of the other samples in the oven should not be changed without the knowledge of the owners.
- The device should be adjusted correctly at the desired temperature.
- When finished, samples should be removed and the device closed.

pH METER

- Calibration of the device should be carried out by using standard pH solutions.
- After the usage, the probe should be cleaned by using pure water and placed in the protective container.

MAGNETIC STIRRER

- The device must be unplugged after use.

CENTRIFUGE

- The opposing chambers of the device should be filled with samples which have equal weights.
- Care should be taken to prevent the spillage of liquid into the device. Sample lids should be wrapped with parafilm.
- The user should wait near the device until centrifugation is complete.

PURE and ULTRA PURE WATER

- Except for very specific studies, many studies may not require the use of ultra-pure water. In these cases, the ultrapure water part of the device should not be used.
- The user should wait near the device until fill their bottle.
- If the device gives any warning, the technical personnel should be informed.

TOTAL NITROGEN and COD DEVICES

- Technical personnel must be informed before starting the experiments.
- The user should wait in the laboratory until finish their experiments.
- Laboratory ventilation must be activated during the experiment.
- If the device gives any warning, the technical personnel should be informed.

CHEMICAL WASTES

Classification of wastes using waste codes

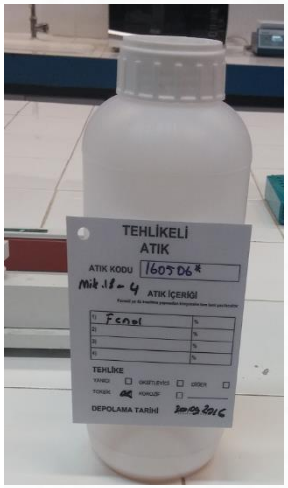
16 05 05*:Laboratory chemicals, consisting of or containing hazardous substances, including mixtures of laboratory chemicals.

15 02 02* : Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by hazardous substances

15 01 10*: Packaging containing residues of or contaminated by hazardous substances

160505*: Laboratory chemicals, consisting of or containing hazardous substances, including mixtures of laboratory chemicals.

The labeled containers are given to waste manufacturer by technical staff



TEHLİKELİ ATIK

ATIK KODU

ATIK İÇERİĞİ

Formül ya da kısaltma yapmadan kimyasalın tam ismi yazılacaktır

1)	%
2)	%
3)	%
4)	%

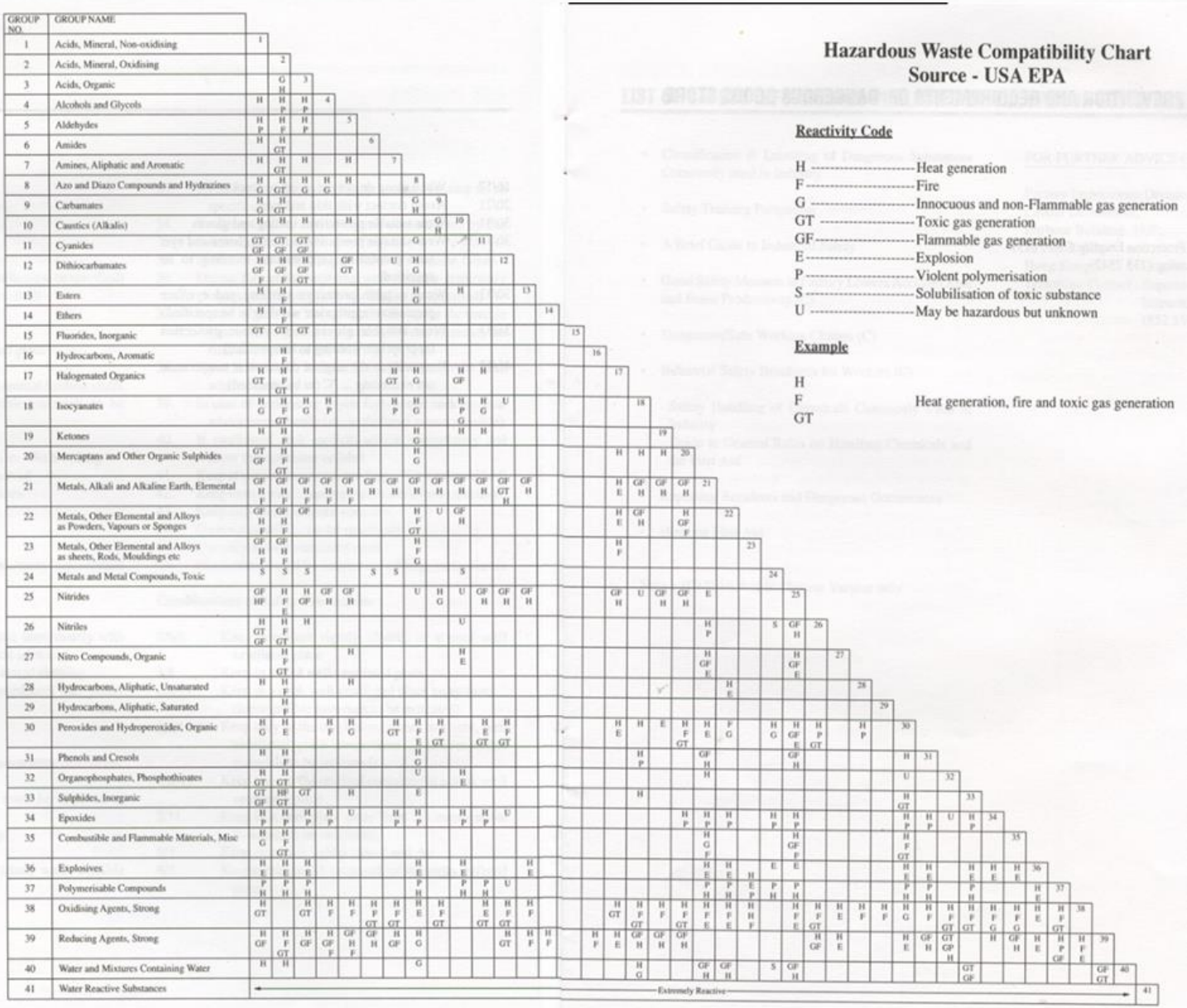
TEHLİKE

YANICI ☐ OKSİTLEYİCİ ☐ DİĞER ☐

TOKSİK ☐ KOROZİF ☐ _____

DEPOLAMA TARİHİ ..../..../.....

EPA



GROUP NO.	GROUP NAME
1	Acids, Mineral, Non-oxidising
2	Acids, Mineral, Oxidising
3	Acids, Organic
4	Alcohols and Glycols
5	Aldehydes
6	Amides
7	Amines, Aliphatic and Aromatic
8	Azo and Diazo Compounds and Hydrazines
9	Carbamates
10	Caustics (Alkalis)
11	Cyanides
12	Dithiocarbamates
13	Esters
14	Ethers
15	Fluorides, Inorganic
16	Hydrocarbons, Aromatic
17	Halogenated Organics
18	Isocyanates
19	Ketones
20	Mercaptans and Other Organic Sulphides
21	Metals, Alkali and Alkaline Earth, Elemental
22	Metals, Other Elemental and Alloys as Powders, Vapours or Sponges
23	Metals, Other Elemental and Alloys as sheets, Rods, Mouldings etc
24	Metals and Metal Compounds, Toxic
25	Nitrides
26	Nitriles
27	Nitro Compounds, Organic
28	Hydrocarbons, Aliphatic, Unsaturated
29	Hydrocarbons, Aliphatic, Saturated
30	Peroxides and Hydroperoxides, Organic
31	Phenols and Cresols
32	Organophosphates, Phosphothioates
33	Sulphides, Inorganic
34	Epoxides
35	Combustible and Flammable Materials, Misc
36	Explosives
37	Polymerisable Compounds
38	Oxidising Agents, Strong
39	Reducing Agents, Strong
40	Water and Mixtures Containing Water
41	Water Reactive Substances

Extremely Reactive

Hazardous Waste Compatibility Chart
Source - USA EPA

Reactivity Code

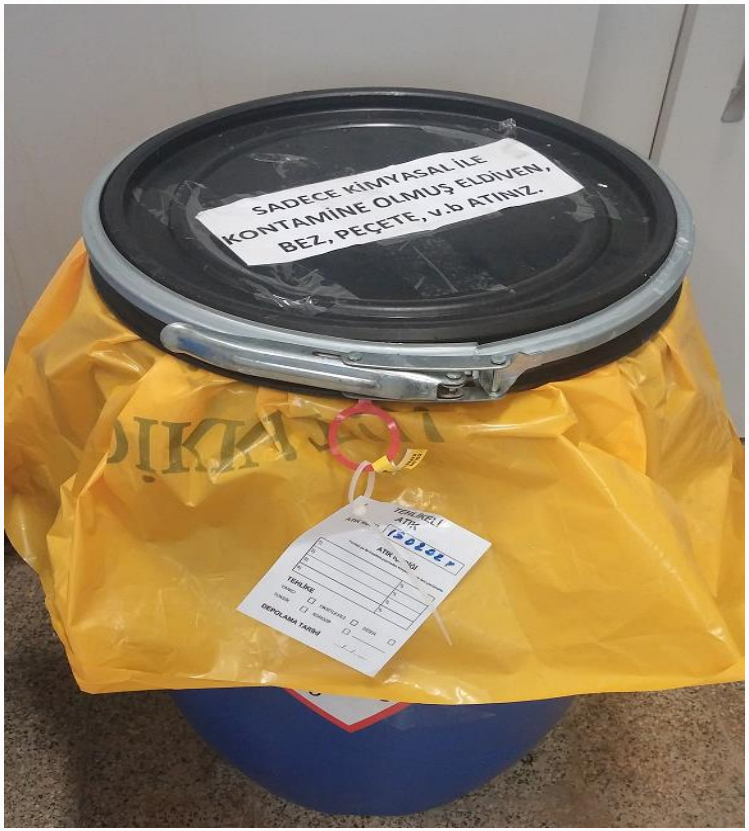
- H ---------- Heat generation
- F ---------- Fire
- G ---------- Innocuous and non-Flammable gas generation
- GT ---------- Toxic gas generation
- GF ---------- Flammable gas generation
- E ---------- Explosion
- P ---------- Violent polymerisation
- S ---------- Solubilisation of toxic substance
- U ---------- May be hazardous but unknown

Example

H
F
GT

Heat generation, fire and toxic gas generation

150202* : Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by hazardous substances



150110*: Packaging containing residues of or contaminated by hazardous substances.

It is necessary to consult technical personnel for packages contaminated with dangerous substances.

After collecting their waste appropriately, the waste manufacturer should contact the Technical Staff and transfer their wastes to the temporary collection containers.

THANK YOU

QUESTIONS?