



UNIVERSITETET
I OSLO

Department of Chemistry

HSE manual

Health and Safety and the Environment

For staff and students

Version 15/12/2023

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HSE manuals of the University of Oslo and the Faculty of Mathematics and Natural Sciences are applicable to the Department of Chemistry.

The HSE manual for the Department of Chemistry (DoC) complements the parent's guides.

The HSE manual will be updated as needed. All staff and students are personally responsible for familiarizing themselves with the content of the HSE handbook and for keeping themselves updated about the HSE regulations at all times. All HSE information is available at the Department of Chemistry's safety website:

<http://www.mn.uio.no/kjemi/english/about/hse/>.

Updates of HSE regulations are reported on the HSE website and an e-mail is sent from the office manager to alle@kjemi.uio.no when any new rules come into force.

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HSE at UiO: <http://www.uio.no/english/about/hse/>

HSE at the MN-faculty: <http://www.mn.uio.no/english/about/hse/>

1. MAIN TARGETS - VALUES AND ATTITUDES

- Students should finish their education at the Department of Chemistry with a good attitude towards HSE and a good understanding of what HSE is.
- Employees must have good work habits and attitudes.
- Employees and students will work in a safe working environment without undue risk of being injured by chemicals, including radioactive chemicals, or by biological agents.
- The physical work environment to meet the requirements of Norwegian legislation sets.
- Employees and students will work in a safe and good psychological work environment where individuals are inspired and motivated to perform.

Values and attitudes

Our culture should be characterized by the fact that all staff and students take personal responsibility for following the policies and procedures and contribute to a secure, safe and good working environment.

2. PSYCHOSOCIAL WORKING ENVIRONMENT AND PERFORMANCE REVIEWS

Our activity is based on mutual recognition and collaboration across group structures and position categories, with equality, openness and respect as our core values.

The department's strategic plan sets out the following:

The Department of Chemistry shall provide its students and employees with a good, inspiring and safe environment that provides responsibility, influence and real opportunities for development.

Reception of new colleagues

We want you to feel welcome as a new colleague, and we strive to give you an enjoyable start at your new job. All new employees are offered a tour of the department, a briefing on HR policy, internal routines and practical issues, information on HSE, radiation protection and general safety measures, as well as an orientation about ground rules, strategic plans and internal organization. PhD students are informed about the conditions for admission and the application procedure for the PhD program.

Performance reviews/ One-to-one work dialogue with permanent employees

The Department's goal is to conduct annual performance reviews/One-to-one work dialogues with all permanent employees. The Head of Department interviews the section leaders, the section leaders interviews the permanent academic staff within their section, the Head of Office interviews the administrative staff, and the Technical Manager interviews the head of the e-lab, the teaching laboratory and the workshop/glass blower. Other technical staff members have their performance review with their supervisor or closest manager. The performance reviews with the technical/administrative staff members are conducted according to a set template.

Follow-up of PhD students

In its strategic plan, the department has set out that we shall conduct reviews and career counselling for our PhD students. The Head of Office/administrative managers at the centers (and in some cases also Heads of Centers) conduct an initial and a performance review with PhD students. The initial review is conducted after 3-5 months, and its purpose is to provide information on how things function at UiO/The Department of Chemistry and to learn how the PhD student felt that he/she was received at the Department. The performance review is undertaken in the third semester and is part of the reporting for this semester. This interview has a particular focus on progression.

The reviews provide PhD students with a point of reference outside of their own research group.

One-to-one work dialogue.

A one-to-one dialogue should be offered to all employees once a year. The procedure for permanent staff is described above. For PhD students this dialog should be with the supervisor, for postdocs and researchers with their project leader. The one-on-one dialogue is conducted according to a set template. For more information see [here](#).

Pregnancy

The working conditions should be of a nature that does not necessitate special precautions for those who are pregnant or breastfeeding, or for persons who wish to become parents. Each employee should nevertheless pause to consider aspects of the working situation in case of pregnancy. Employees should request an interview with their immediate supervisor as early as possible. Topics for this meeting:

- Current working situation.
- Overview of issues that may be affected by the pregnancy.
- Needs for facilitation, if any.
- Students should contact their supervisor or the person responsible for the course to clarify any needs for facilitation and the available options, in consultation with the Student Adviser.

Working environment surveys

The department conducts working environment surveys on a regular basis. The last working environment survey was undertaken in 2017. From 2024, a working environment survey will be conducted every three years for whole UiO.

Handling of harassment

Harassment and undesirable behavior are unacceptable. Those who feel harassed or bullied are recommended/requested to report to the Safety Deputy or the HSE Coordinator (or the Head of Department or the Head of Office). Alternatively, also UiO's reporting system can be used (<https://www.uio.no/english/about/hse/speak-up/reporting/>).

Students may use the web site "Speak up about the learning environment" <http://www.uio.no/english/studies/contact/speak-up/>.

Information meetings (Husmøter/allmøter)

Information meetings for all employees are arranged on a regular basis, currently on the last Thursday of every month. The meetings provide information on ongoing processes, discussions in management groups and on the board.

Social events

Every Wednesday free waffles, tea/coffee is served in the lunch room (kantina), and all staff members are encouraged to attend. Each year, the Department of Chemistry arranges some traditional social events for its employees and students.

- Christmas lunch: Lunch for all employees and the Chemistry Students' Committee, held in December.
- Summer party: Party for all employees and students affiliated to the Department of Chemistry/Centre for Materials Science and Nanotechnology, held in June.

General enquiries regarding ethical issues

Those who wish to address an ethical issue, be it cheating, fraud, legal competence or other matters, should contact the Head of Office, who will pursue the matter.

3. RESPONSIBILITY AND AUTHORITY

For a HSE system to work well and to comply with HSE regulations and requirements, clear and well documented delegation of authority and responsibilities is required.

The head of the Chemistry Department has overall responsibility for all aspects of HSE. This means that the head of the Chemistry Department has responsibility for ensuring that all operations at the Department of Chemistry are run properly and that the regulations are followed. The Head of the Chemistry Department may choose to delegate some of the responsibilities to others. The Chemistry Department has its own radiation specialist (Radiation coordinator) and Health, Safety, and Environment Coordinator (HSE coordinator) who coordinate and ensure that all staff and students have protection from exposure to radiation and chemicals, and are safe while performing general laboratory work. The office manager is responsible for ensuring that the Chemistry Department has a working environment which is conducive to a healthy psychological state of all employees and students.

All staff and students have a personal responsibility for ensuring that rules and procedures are followed and for contributing to a safe working environment.

All employees and students have the additional responsibility to report all accidents and situations that they deem unsafe.

HSE issues should be resolved at the level where the problem exists. This is to ensure that those involved in the problem, participate in solving the problem with a result that is reasonable and technically realistic. Leaders at each level are responsible for ensuring that rules and procedures are known and followed. Responsibility for HSE while working in workshops, the Central Storage, and administration are those of the leaders of these departments (technical director and office manager).

With regard to research activity at the Chemistry Department – those responsible for the activities of individual research groups (Associate Professors and Professors) are responsible for all aspects of their research, including research of master students, PhD students, researchers, post-doctoral and visiting researchers. Everyone involved in laboratory operations should be linked to a permanent research leader (Associate Professors and Professors). For each and every one of the laboratories at the Department of Chemistry a permanent employee of the Chemistry Department is assigned responsibility for all aspects of HSE for that laboratory related to the activity that takes place at the specific laboratory.

Matters that relate to safety and working environment that cannot be easily resolved locally will be sent to the local working environment committee at the Department of Chemistry (LAMU) for treatment. HSE Coordinator is secretary of the committee. The management, staff, research fellows and students are all represented in LAMU.

HSE Coordinator will contribute to all efforts by the Chemistry Department performed within the framework of applicable laws and regulations relating to HSE, and will always be updated on current laws and regulations. HSE Coordinator oversees and controls HSE of the department (and the sub-centers). The Safety Coordinator has the authority to immediately stop work that he/she believes to violate applicable HSE laws and regulations.

Radiation Protection Coordinator (RPC) shall ensure and safeguard that all work at the Department of Chemistry is performed within the regulations of good radiation protection practices. The RPC shall always be updated on laws and regulations related to radiation protection. The RPC is to specifically oversee and control all work with radioactive materials and machinery/equipment that generates ionizing radiation. The RPC has the authority to immediately stop work that they believe violates applicable laws and regulations.

Safety representatives (safety deputies) are the employees' representatives in the working environment issues. They are also represented in the local working environment (LAMU). Delegates are to ensure that work at the Chemistry Department is conducted in a prudent manner and that all relevant regulations are followed. If a safety representative considers that the life or health of employees is in immediate danger and such danger cannot be averted by other means, work may be halted. There are currently 14 safety representatives at the Department of Chemistry.

The Department of Chemistry performs annual environmental and safety reviews. Deviations from the desired situations are reported in a form. The forms are stored centrally in the administration (HSE coordinators office) which are freely accessible to all. Copies of the forms are sent to those responsible for rooms at the Chemistry Department. The persons responsible for each individual room are required to follow up all reported problems in their rooms; they are responsible that problems are solved as soon as possible. The person responsible for the room must report to the HSE Coordinator when a defect is repaired. The Safety Coordinator will follow up those cases where problems are not corrected within the time limit set in the forms. Delegates will make spot checks.

If there are not sufficient funds to repair identified faults and problems, the person responsible for the room or the HSE coordinator must inform the Head of the Chemistry Department in writing of the problem. The HSE coordinator and the Head of the Department of Chemistry will take the issue(s) further. Disclaimers relating to laboratory work are further described in "Chapter 6 Safety representatives" of the Working Environment Act.

[Working Environment Act - Chapter 6. Safety representatives](#)

4. MANDATORY TRAINING PLAN FOR HSE AT THE DEPARTMENT OF CHEMISTRY

Bachelor students.

Bachelor students who are going to attend laboratory courses, will participate in HSE training given by the MN faculty. It consist of fire-fighting, laboratory safety etc. The students will also get a 45 minutes safety review before the first day of laboratory course.

Master students.

New master students will participate in the HSE week in August where the students will get information about HSE regulations, the HSE manual of The Department of Chemistry, hazardous waste, gas bottles, radiation and chemistry experiments. In addition, students get training within the research sections/groups specifically for the laboratories and instruments they will use. Master students who work in the laboratory and with chemicals and/or gasses have to take the online courses in "Handling of chemicals, regulations and responsibility" and "Gas security". Access link to the courses are available from the HSE coordinator.

Employees.

Employees and guest researchers must be familiar with the HSE manual of the Department of Chemistry and participate in the HSE course before starting work in the laboratory. Master's students at UiO who start in a position as a PhD research fellow must repeat the HSE training.

Please find below the list of mandatory HSE training for employees and guest researchers at the Department of Chemistry.

- Read and understand the Department's [HSE manual](#)
- HSE course (offered once a month, see for next date [here](#))
 - Module 1 - mandatory for all employees (~30 min)
 - Module 2 - mandatory for all employees and guest researchers working or teaching in the lab (60-75 min)

People cannot start working in the laboratory before the safety course is completed.

- Fire prevention course: two (2) hour fire prevention course with fire extinguisher exercise (offered every September and February). Employees should take a refresher every 5 years.
- Online courses:
 - Handling of chemicals, regulations and responsibility (mandatory for personnel working in the laboratory)
 - Gas security (mandatory for personnel working with gas)
 - Chemical registry (EcoOnline; [video in Norwegian only](#))

Link to online courses:

<https://www.uio.no/english/for-employees/competence/overview-courses/hse/online-courses/>

People cannot start working in the laboratory before the HSE safety course and the online courses have been completed. Before starting work in the laboratory also local/laboratory specific HSE training should be completed (see below "Other")

Responsible for implementation: HSE Coordinator in cooperation with an office/study consultant. HSE Coordinator is responsible for ensuring that participation is documented.

Other

- Individual academic staffs are responsible for training of all persons associated with their research in the routines that are specific to their research, including procedures which are not described in the manual.
- Management and safety representatives shall also take the department's HSE courses; the person who is responsible for ensuring that they take this training is the office manager.
- Staff who teach laboratory courses will undergo training in first aid procedures. Time: A few days before the laboratory course in question begins. Responsible: HSE Coordinator. The HSE coordinator is responsible for registration and ensuring that those people who are registered take part in the course.
- Bachelor students will have safety training on their first day in the laboratory. Course labs will have all information regarding chemicals as set by regulations available in the laboratory in paper form. Person responsible: Course manager.
- All employees and master students shall be familiar with "The Department of Chemistry Safety Manual."
- All staff and students have to complete an online test. A record of those persons that have passed the test will be archived in the HSE coordinators office. For employees, participation will also be registered in SAP.
- [UiO HSE training procedure](#)

Manager with staff responsibility

As a manager with staff responsibility, you must complete a HSE classroom course, module 5+6 and 7. All Associate professors and professors at the Department of Chemistry are encouraged to take these courses.

Self-declaration (mandatory)

All M.Sc. students, new staff and guest researches must submit the self-declaration before commencing work in the laboratory or within 4 weeks of starting their position for those not working in the laboratory. A copy must be included in the laboratory journal. The self-declaration must be updated or resubmitted whenever work tasks and associated risk factors change or additional safety courses have been taken. Link to [self-declaration](#).

5. GENERAL SAFETY AND FIRST AID RULES

All students and staff will perform their work in a safe manner, which prevents injury and future health problems. Students and employees must comply with the rules that exist.

5.1 Emergency preparedness plan

In case of an acute and serious accident, you will help people who require help.

- In acute need of medical attention you are to call an ambulance as soon as possible:
Call phone number: **113**
- During a fire; first, attempt to extinguish the fire if you feel you can do so safely - then set off the manual fire alarm switch and call the fire department (number **110**). Evacuate the building.
- For serious crimes: Call the police immediately (number for the police **112**)

The address to the Chemistry building is: **Sem Sælands vei 26, 0371 Oslo**

Alerting the emergency preparedness management.

The Department of Chemistry has an emergency preparedness plan in case of accidents at the Department where handling of crises is necessary.

The emergency preparedness management is to be alerted by incidents at the Department of Chemistry or at events arranged by Dept. of Chemistry where handling of crises is necessary.

Head of the Emergency Preparedness group:

Head of the Department: Einar Uggerud	47 60 22 09
Office Manager Line Altern Halvorsen Valbø	93 66 13 30
Technical Manager Bjørn C. Helland-Hansen	91 14 79 94
HSE coordinator Eva Kathrin Lang	90 70 34 71

Other members of the group:

- The Leading Safety Representative
- The Radiation Protection Officer

Normally the Security Alarm Center, phone number 22 85 66 66, will be alerted directly in case of big accidents. The Security Alarm Center alerts the Head of the Emergency Preparedness group. If the preparedness management get the message directly, they must alert the Security alarm Center.

The security Alarm Center will consider if the Central Emergency Preparedness management has to be alerted.

5.2 Simple first aid

- **The basic rules in case of injury are:**

In the case of a serious accident you will help persons in need, where you can do so without exposing yourself to undue risk. Contact other persons (see the former point) as soon as possible. When chemical accidents occur, those treating the injured person must be given notice of what the injured person has been exposed to (chemical name, quantity, etc.).

- **Cardiac arrest.**

Call 113 and start external cardiac massage (CPR) immediately! If you are more helpers: One person starts cardiac massage by pressing strongly in the middle of the breast 100 times per minute, until the ambulance arrives. The other alerts quickly by calling 113 and arranges that somebody meet the ambulance. Another person get the heart starter (AED defibrillator) at the Department's Expedition: push the start button and follow the instructions (Norwegian). NB! The most important thing to do is the external cardiac massage. If you are only one: Call 113, start giving external cardiac massage and keep on until the ambulance staff takes over. Call for more helpers.

- **Chemical splashes in the eyes.**

Rinse the affected eye(s) consistently with water or preferably using an eyewash bottle. Continue rinsing the affected eye(s) on the way to the doctor (remember to bring extra eyewash bottles for use on the way to the Oslo Emergency Centre (Tel: 11 61 17)). Call 113 in case of emergency and serious eye injuries. ***If you splash chemicals in your eyes, always contact the Oslo Emergency Centre Tel: 116 117***

- **Chemical spills on skin and clothes.**

Rinse with plenty of cold water and remove all contaminated clothing, shoes and jewelry. Wash with soap and water. Skin contact with contaminated clothing may give more harmful effect than spill directly on the skin (it is therefore important to change disposable gloves often). In case of a large spill, use one of the emergency showers, which are located in the laboratory or in the corridor. You may continue showering with hot water in the basement, near the toilets.

- **Phenol** may be removed by using Pyrisept salve. If working with Phenol make sure to have SOP and emergency procedures in place. Ensure Pyrisept is available in the First Aid Cupboard before starting to work. Contact HSE coordinator if no Pyrisept is available. If exposed to phenol, ***contact the Oslo Emergency Centre Tel: 116 117***

- **Bromine on the skin.** Wash with thiosulphate solution and cold tap water.

- **Hydrofluoric acid on the skin.**

Immediately flush the affected area thoroughly with water. Rinse with a calcium chloride solution (calcium chloride) or cover the affected skin with HF Antidote Gel. Seek medical treatment. Make sure a SOP (including spill clean-up and emergency procedures), calcium chloride solution and HF antidote gel are available before starting to work with hydrofluoric acid.

Hydrofluoric acid injury: Always contact the doctor: Oslo Emergency Tel: 116 117

- **Ingestion of chemicals.**

Drink plenty of water to dilute the chemical. Get medical attention. Call Poisons Information Center (tel. 22 59 13 00). See Material Safety Data Sheet for detailed information.

- **Inhalation of toxic gas, vapor or dust.**

Provide access to fresh air and keep the person as calm as possible. Contact a doctor / ambulance. If the patient is unconscious and not breathing start **Cardiopulmonary Resuscitation (CPR)** (See cardiac arrest above). HSE-manual - Department of Chemistry 09.03.2016

- **Electric shock.**

Remove the person from the electricity source. If the patient is in cardiac arrest: Call 113 and start CPR.

- **Wounds from glass cuts or the like.**

Rinse with cold tap water. Stop the bleeding by applying pressure to the cut; use the "one-man package" or "blood stopping" ("Enkeltmannspakke") in the first aid cupboards. Contact a doctor or ambulance for treatment.

- **Burns**

Rinse the damaged area with cold water from the nearest tap for a minimum of 15 – 20 minutes. Continue treatment even during transportation to the doctor and during any waiting in the hospital. For serious burns call an ambulance (113).

- **Frost injury, superficial.**

Keep the damaged area in water with temperature 40-42 °C, do not scrub. Contact a physician.

- **Frost injury, deep.**

The injured person has no feeling in the exposed area, the skin is firm and immovable in relation to the tissue beneath: Call 113.

- **Fainting.**

Ensure the persons air passages are clear by removing clothes from their neck, lay them in the recovery position, loosen tight clothing, check for pulse and respiration, and ensure their tongue is not impeding their airway. If necessary begin CPR immediately. CPR should continue until paramedics take over. Even if you are tired continue to work.

- **Shock.**

Symptoms: Anxiety, blue lips and fingernails, chest pain, confusion, dizziness, pale, cool, rapid but weak pulse. Take the following steps if you think a person is in shock: Call 113. The person should be lying flat. Give first aid for any wounds, injuries and illness. Do not give anything by mouth. Do not move the person with an unknown or suspected spinal injury.

Other major injuries:

Always contact the doctor: Oslo Emergency Tel. 113 (Acute) or Tel.: 116 117

Other injuries: Get medical attention as needed. If in doubt, ask a doctor Tel.: 116 117

5.3 First-aid equipment

First-aid cabinet. All laboratories must have a first-aid cabinet, which must contain:

- 1 package band aid
- Triangle handkerchief (sling)
- Safety pins, scissors and tweezers
- Elastic bandage big
- Elastic bandage small
- Compression pack
- Sports tape
- Wound cleanser
- Eye glass and saline solution
- Cold pack

Make a note of the location of the cabinet to avoid searching for it in case of injury. Check the contents. Restock it with material from the Central storage if items are missing or contact the HSE Coordinator.

Eye-wash bottle. All laboratories should have at least one eye-wash bottle. Make a note of its location to avoid having to search for it in case of injury. Check the expiration date. If the Eyewash bottle was used or the date is expired, get a new bottle from the HSE Coordinator.

Emergency shower. Make a note of where the nearest emergency shower is located to avoid having to search for it in case of an accident. The emergency showers are checked by the Department every year.

Emergency cabinet in the corridor. Make a note of where the nearest emergency cabinet is located. The cabinets contain:

- Eye-wash bottle
- Full-face mask with combination filter (for organic and inorganic vapors, acidic gases and ammonia)
- First-aid equipment (gauze pads, adhesive bandages etc.)
- Absorption agent and spill pads for chemical spills

When collecting chemical spills outside the ventilation cabinet, a gas mask must be worn if the chemical in question emits poisonous/harmful vapors.

The cabinet is checked annually. Mask filters are replaced annually. The cabinet is sealed. Broken seals must be reported to the HSE Coordinator.

Fire extinguisher. All laboratories must have a 2 kg CO₂-based fire extinguisher. Make a note of its location and how to operate it. All fire extinguishers are checked annually by an external company.

AED Defibrillator



In case of cardiac arrest, and AED (automated external defibrillator) is located in the hallway of the Department's administration, across from the Ekspedisjonen. The cupboard opens via rotating it to the left. By doing so, an alarm will go off. The AED available is a Defibtech Lifeline AED. It is supposed to be easy to use: Turn on the device, listen and follow the instructions.

Demonstration video: <https://www.youtube.com/watch?v=2Pwq3mKPI5I>



AED Defibrillator across the Ekspedisjonen.



Model DDU-100: Defibtech Lifeline AED.

5.4 Waste Disposal Procedures

Regular waste. Residual waste.

Regular waste is to be sorted according to its source of material. There are five categories: Food waste, plastic, paper, glass and metal, other waste. You will find these waste bins in the kitchens and hallways.



Example: Put tea bags, orange peel, food, coffee filter in bin for food waste (green), plastic in blue bin and other waste in grey bin

Not: Sharp things and hazardous waste.
Broken ceramics and hardened glass (e.g. Pyrex) should be thrown into regular waste.

You will find the bins in the corridor.

Regular waste in laboratories.



In the laboratories there is no sorting of regular waste according to its source of material. There are bins for regular waste which are emptied by the cleaning staff once a week.

You may put non-hazardous waste in it, for example tissues and gloves which are not contaminated with hazardous substances.

Not: sharp things, glass and hazardous substances

Paper, carton



Box for recyclable paper (if you don't have one, contact the Estate Department by using this link:

<https://www-int.uio.no/english/services/estate/send-message/index.html>

Not: plastic, styrofoam.

Shredding of large volumes of documents:

Contact the Estate Department by using the link above.

**Paper container**

The boxes may be emptied every Thursday between 9:00 and 13:00 in the grey containers located by the elevators. Cardboard boxes may be folded up and put into the containers as well.

“Confetti” from paper maculators has to be put into a cardboard box. Otherwise it will make trouble in the compactor.



Cardboard boxes may also be thrown directly into the paper compactors located in the backyard.

NB! Remove plastic wrap, styrofoam and fiberglass ribbons first. Plastic wrap, see next point. Styrofoam and fiberglass are residual waste, ("restavfall").

Plastics

Plastic (assorted plastic) may be put into the plastic waste container located in the backyard, called “Energiplast”

Not: Styrofoam and fiberglass ribbons. Fiberglass ribbons are to be thrown as residual waste. Styrofoam see next page.

Empty chemical plastic containers: Only clean, empty containers. Others have to be given to the HSE-coordinator.

Isopor/Styrofoam



Styrofoam can be placed into a collection bag at the backdoor of the Central Storage.

Laboratory glass

Laboratory glass must be separated into brown and clear glass. Brown glass is most often original chemical containers, such as glass solvent bottles.



Collect the laboratory glass in a bucket in the laboratory. If possible, collect already there brown and clear glass separately. **All glass must be clean and free for chemicals before disposal!** Small amount of solvents can be evaporated under the fume hood. Empty full bucket into the laboratory glass waste in the Chemistry backyard.

If it is difficult or impossible to get the glass clean, it may be given to the HSE-coordinator. Small laboratory glass items that cannot be cleaned maybe thrown into the yellow risk waste bin (see section 8)

If you have larger broken glass items that are contaminated and cannot be cleaned, then please contact the HSE coordinator for disposal. Make sure to label the glassware with the name of the chemical it is contaminated with.

Please make also sure not to throw laboratory glass into the regular glass waste and vice versa.

EE-waste

Electric and electronic waste is to be thrown in the big basket containers in the backyard of the Chemistry building.

NB! Do not put anything outside the containers. Refrigerators and big devices:
Report to:

<https://www.uio.no/tjenester/eiendom/send-melding/>

Metal

Metal is to be thrown in the container labelled “Metall” in the backyard.

Wood

Wood is to be thrown in the container labelled “Trevirke” in the backyard.

Residual waste



Waste which does not belong to any of the above-mentioned categories may be thrown in the compactor container labelled “Restavfall” in the backyard.

Risk waste

Risk waste includes **Hypodermic needles, cannula needles and “Clinical waste. Unspecified”**.

Risk waste is waste, which may harm the cleaning staff or the waste staff, may be put in yellow boxes labelled “Infectious substance”.

The yellow risk waste bins (picture below) are available from the Central Storage. When the box is full, put on the lid thoroughly and return the full bin to the “Miljøsafe” in the backyard of the Chemistry Department. You can open the “Miljøsafe” with your office key. Please fill in the disposal sheet inside the door.

Example: Biological agents, infectious waste, needles, small sample glasses with scintillation liquid etc., gloves and tissues contaminated with dangerous substances **(NB if they are not contaminated, throw them as regular waste!)**, small chemical containers which are difficult to clean (only if non-reactive, non-flammable, non-toxic). If you have larger contaminated items, please contact the HSE coordinator for disposal.



“Miljøsafe” in the backyard



Container for infectious substance and risk waste



Hypodermic needles, cannula needles. Put them into a dispenser or an empty bottle (relabel the bottle). Shut it thoroughly. If they are contaminated, put them into yellow risk waste containers for “Clinical waste . Unspecified” (see above).

Hazardous waste incl. solvent waste

Chemical waste (solvent waste, old chemicals for disposal, samples, etc.) and other hazardous waste which are not belonging to any of the abovementioned categories: see HSE website and “Hazardous waste guide”: [Waste Management - Department of Chemistry \(uio.no\)](https://www.uio.no/tjenester/eiendom/send-melding/).

Furniture and big object

Furniture and other big objects (e.g. instruments) which are to be thrown: contact the Estate Department by using this link: <https://www.uio.no/tjenester/eiendom/send-melding/>

Batteries You will find a box for these in the Central store. Batteries containing lead, lithium or cadmium need to be collected separately. Make sure to take lithium batteries to avoid shortening and place batteries that are damages into small zip-log bags (available at the disposal station). For more information see “[Hazardous waste guide](#)”.

In case of any questions regarding hazardous waste, contact the Department's HSE coordinator!

5.5 Miscellaneous

- **Theft.** Always lock the door when the last person leaves the laboratory; this is to prevent theft of chemicals and other valuables. Report suspicious persons by sending an email to alle@kjemi.uio.no.
- **Asbestos.** There is asbestos in all interior walls in the chemistry building, therefore these walls should not be drilled into or sanded. Any flaking or chipping of these internal walls is to be reported to the HSE coordinator.
- **Drinking water.** The gray laboratory faucets contain water with high levels of cadmium that are harmful to ones health if the water is drunk. The water from these taps must not be used for drinking water.
- **Gloves** are to be used only in the laboratories.
- **Laboratory coat** which is used in the laboratory should not be worn outside the lab.
- **Sandals** should not be worn in the laboratory.

6. FIRE INSTRUCTIONS

- Everyone at the Chemistry Department must familiarize themselves with local evacuation routes, the location of nearest fire extinguishing equipment, and the nearest manual fire alarm switches. The individual is required to familiarize themselves with the use of fire-fighting equipment. NB! Extinguishing Apparatus and fire hose is found in all east-west corridors in the black cabinet marked with symbols for fire-extinguishing equipment (see photo below).
- The building is equipped with an automatic fire warning system based on smoke detectors and heat detectors. The fire department is automatically notified when these detectors are tripped off.
- In case of fire: Try to quickly extinguish the fire while it is still small, but do not do this if you think that you are risking injury.
- Anyone who discovers a fire is to alert others in the neighboring rooms to the fire. Use the manual fire alarm switches and if possible immediately call 228 56666, (UiO Security Operation Center) if the alarm is not triggered automatically. Manual fire alarm switches can be found in the corridors near the stairways and in some other places. Note the location of your nearest manual fire alarm switch.
- When the fire alarm is sounding, everyone is to evacuate the building immediately. Ensure you close all gas taps and bottles before you leave the building. Close, but do not lock, all the room and hallway doors. Look in neighboring rooms. Help disabled people or other people who are having trouble leaving the room. Use the nearest emergency exit, do not use elevators.
- Fire department and or the fire coordinator (Estate Department) will determine when you can go into the building again.
- Keep escape routes clear of all obstacles. Cabinets or other furniture cannot be placed in the corridors if they hinder the escape routes. All black metal doors are fire doors and shall be kept closed at all times. Please close these doors when you find them open. Few doors are shutting automatic by fire alarm, they are kept in open position with a magnet.
- Short [UiO-video](#) about fire safety (Norwegian only)
- [HSE - Fire safety - University of Oslo \(uio.no\)](#)



7. LABORATORY WORK: SAFETY IN THE WORK PLACE

Target for safety in the workplace (laboratory)

- Students shall have a good attitude towards and understanding of, health, safety and the environment (HSE) when they complete education at the Department of Chemistry.
- Employees must have safe work habits and a positive attitude towards laboratory safety.
- Employees and students will have a safe working environment, without undue risk of becoming ill or suffering injury by chemicals, including; radiation exposure and biological agents.
- Everyone shall follow the same basic set of rules, have the same expectations on how work is to be carried out safely in the laboratories, so as to reduce the chances of accidents and injuries in the laboratory.

7.1 Liability and general guidance

Academic staff responsibilities

Associate professors and professors are responsible for all persons associated with their research activities. They must ensure that all work is performed within the framework of the systematic HSE work. This involves:

- Check the student/research fellow has knowledge of the general HSE rules.
- Ensure risk factors are assessed before work is commenced.
- Obtain Material Safety Data Sheets (MSDS) for all substances to be used.
- Ensure that those persons who will perform the work have the necessary information and training on working methods, hazards, safety measures and instructions.
- Have responsibility for the apparatus to be used as well as training in their correct use.
- Ensure that student's experimental journal contains all experimental work.
- Ensure that all chemicals are labeled correctly.
- Regularly check the work performed in their laboratories and the tidiness of their laboratories.
- Ensure that chemicals are disposed of in accordance with applicable procedures as soon as possible after the completion of experiments.

Associate professors and professors for foreign language students/research fellows have the responsibility to verify that procedures are understood and that laboratory conditions will not present a safety issue for the foreign language students.

Course responsibility

The professor in charge of the course in question shall guarantee that safety is ensured during the period of time that laboratory work is performed, this also includes safety for all other types of courses at the Chemistry Department.

Room responsibility

For each room (laboratory, workshop, auditorium, etc.) there is to be appointed a person who is responsible for that room.

A complete list of persons responsible for rooms at the Chemistry Department can be found on the HSE web page. This list is maintained by the appointed Safety Coordinator.

Room responsibility role

- Have control and knowledge of the activities that take place in space.
- Ensure that activities follow the established procedures.
- Provide adequate labeling of laboratory chemicals.
- Ensure that cleaning staff and staff from the technical department or external company perform their work unimpeded and without undue risk to their health. This means, among other things to ensure the necessary updating of the exterior signage of the room.
- Those persons responsible for rooms must be full time employees of the Chemistry Department and be available (or represented by a deputy) when the safety of the room is tested.

All employees are responsible

All employees are required to know and to comply with applicable environmental, health and safety procedures for their research activities. They should plan and perform their work in the safest manner possible, and notify their manager (associate professor or professor) of conditions they consider to be dangerous. Injuries, accidents, and near misses must be reported to the employer in accordance with approved guidelines. This applies to students as far as is appropriate.

Student's responsibility

Students must participate in the implementation of the health, safety and security measures. They are obliged to perform their work in accordance with orders and instructions from the department. Students will be informed of their obligations to actively participate in environmental, health, and safety to limit interruption to their work - when they cannot continue work without some degree of danger for their selves and persons working around them.

The safety representative's role

The role of the safety representative is to represent the staff in matters relating to the working environment, ensuring that employee health, safety and welfare are protected by the employer, to participate in the establishment and maintenance of systematic health, safety and environment management, and to work with managers to maintain and improve the working environment. See also: [Safety representatives - University of Oslo \(uio.no\)](https://uio.no/safety-representatives)

Access

Only persons who are aware of the potential dangers associated with worked performed in the laboratories have access to the laboratories. Minors generally are not allowed access to the laboratories, but rules do apply for special cases such as laboratories/units (for example, school laboratory) which allow minors access to the laboratories. Minors must apply for 'special access rights' in advance with the Department's Safety Coordinator to gain access to laboratories (minors cannot enter the laboratories until they have received written confirmation of 'special access rights' from the Department's Safety Coordinator). If unknown persons are found in the laboratory or in other premises of the Chemistry Department, it must be reported to security instantly. Staff of the Department of Chemistry is allowed to ask for photo identification of unknown persons found within the department.

Laboratory work outside normal working hours.

- As a general rule, laboratory work should be carried out during normal working hours (08–18). Laboratory work outside normal hours should never be approved for unexperienced personnel.
- Low risk procedures as per documented risk assessment, may take place outside normal hours following lab responsible person approval. General approvals for recurring low risk procedures may be issued for specified personnel and time periods.
- Procedures with increased risk of adverse events, included but not limited to high temperature, high voltage, high pressure, chemical exposure or mechanical damage, must be separately approved. Such work outside normal hours will require minimum two persons being present in the lab.
- Regardless of risk level, all personnel performing lab work outside normal hours must have access to a mobile phone with preloaded emergency number 22 85 66 66.
- All approvals and pertaining risk assessments must be documented and recorded in the personal laboratory notebook.

Cleanliness

- The individual employee and student is responsible for cleaning their work area during work hours. Laboratories should always be kept clean and tidy. Please contact the person responsible for the room when needed.
Laboratories should be locked and windows closed when nobody is present, so that none has access.

- The name of the person responsible for each room will be posted on the entrance doors to all rooms. The person responsible for each room is responsible for ensuring users clean after themselves. It is not the task of the person responsible for the room to clean up after others.
- Chemicals and equipment should not be borrowed or removed from the place of use without the consent of room responsible person. Those responsible for instruments must be informed about the defective equipment.
- Each laboratory should have chemical cabinets with extraction (if required) for the storage of hazardous chemicals and a fume hood (if required) to work with these chemicals.
- Special rules may apply to individual laboratories; everyone is required to familiarize themselves with the local work practices that may apply to the areas they are working in.
- Violation of safety rules (University, faculty or department) must be reported by the person who discovers the violation to the responsible person for reporting/repairs.

Personal protective equipment

Personal protective equipment must be available in the laboratory and used if conditions require.

- Standard attire for working in chemistry laboratories are a laboratory coat and safety glasses (prescription glasses do not replace safety glasses unless they have been specially adapted). Contact lenses can be used in combination with safety glasses.
- Do not wear shorts or sandals in a chemistry laboratory.
- Gloves should be available at all chemistry laboratories.
- Gas masks, face shields etc. should be provided if required.
- Always use fume hoods when working with chemicals. Non-hazardous chemicals can be weighed out using a balance that is on the bench. When weighing out harmful compounds, the balance must be moved into the fume hood or an approved gas mask may be used.

Fire fighting

All laboratories must be equipped with a fire extinguisher (CO₂) and a fire blanket (labs for organic chemistry). All corridors near the stairs have a cupboard with a fire extinguisher (powder) and a fire hose. Fires in their early stages are usually easy to stop; fast action is therefore required before the fire becomes 'established' if you are going to attempt to fight the fire. Proper selection of extinguishing media is critical:

- Hair or clothing fire: Fire blanket or a blanket (moistened with water) and emergency shower. If you are alone and no emergency shower nearby, you can roll around on the floor to put out clothing fires.
- Fire in open vessel: Preventing the supply of oxygen by putting something close over the opening (book, glass). If the vessel is on a hot plate, turn off the heat and lift the vessel slowly away from the hot plate. If a powder fire extinguisher is used, take care that the liquid does not spray out.
- Burning organic material on the laboratory bench or floor: Dry chemical or CO₂ extinguisher.
- Electrical fire: Powder and CO₂ extinguisher, or water if the power supply to the affected equipment has been turned off.
- Phosphorus Fire: Wet sand.
- Fire in sodium, potassium, lithium and magnesium: Dry sand or special powder extinguisher for metal fires (type D).
- Wood fire: Water, when it can be risk-free in relation to chemicals in the vicinity to the fire, powder extinguishers can be used in place of water.

7.2 Risk assessment, Standard Operating Procedure and Safe Job Analysis

Purpose

A Standard Operating Procedure (SOP) is a written step-by-step procedure on how, for example, to use an instrument, to make a standard solution, or to carry out a routine experiment. SOPs should include a Safe Job Analysis (SJA)/risk assessment, emergency procedures, spill clean-up procedures, and waste disposal routines, if relevant. The SJA identifies potential hazards and describes how to minimize the risks.

SOPs with risk assessment and SJA need to be established when designing new experiments, taking new instrumentation into operation as well as for routine operations involving risks, such as filling of cryogenes, work with lasers, work in magnetic fields etc. The routine has been designed to protect employees and the environment against injuries and accidents.

- All scientific and educational use of chemicals, biological agents (bacteria, virus, fungi etc.), physical factors and radiation sources are to be described in an SOP.
- SOPs/SJAs are to be approved by the laboratory room responsible person and a copy is to be sent to the HSE coordinator.
- All SOPs/SJAs should preferably be written in English. **A template for Standard Operating Procedures and Safe Job Analysis** as well as some key SOPs/SJAs are available on the Department's [HSE website](#).

Responsibility

- The HSE coordinator is responsible for communicating the need for this type of analysis.
- Supervisors must ensure that analyses are undertaken wherever necessary, and that the routines are implemented and complied with.
- All employees and students must follow these routines. Each and everyone is responsible for following the procedure.

A SOP with risk assessment and safe job analysis includes:

- Dividing the job operation into its individual steps.
- Review of all risk elements (ergonomic, biological, chemical, physical, mechanical).
- Describing existing preventive measures, such as safety routines, personal protective equipment, identification of hazards and training.
- Identification of new measures, with appointment of a person responsible and a deadline for implementation.
- Emergency planning
- Hazardous waste management

All job operations shall be subject to risk assessment. Events that could be linked to the hazards shall be assessed in light of their likelihood and consequences.

Availability

Completed SOPs/SJAs shall be available in the location where the job operation is undertaken, for example in the form of posters, paper copies in an SOP/SJA folder, or electronically.

7.3 Proper use of fume hood

Goal

To ensure that all work in fume hoods at the Department of Chemistry is carried out using methods that are safe and reduce the chance of accidents or injuries.

Liability

The person responsible in each laboratory is responsible for ensuring that the rules for working in fume hoods are followed.

Procedure

- Ensure that the fume hood has been cleared of unnecessary equipment, bottles, etc. before work begins. Unnecessary equipment, bottles, etc. may destroy the laminar airflow and they may also contribute to a starting fire.
- When it is required, suitable gloves must be used.
- There are two types of fume hoods at the Chemistry building: New automatic hoods and older hoods, which are manual controlled.



New hood



Old hood

For both of the types the sash opening should not be more than 30 cm when working in the hood.

- New hoods: Check that the green lamp (see arrow) is lightening. If red lamp is lightening (and alarm sound), try with lower sash opening. If it's still red, contact technical staff. When you leave the laboratory, close the sash. Some, but not all sashes, will close automatically, therefore make sure that nothing is in the way of the sash.
- Old hoods: Turn the switch (see arrow) to "MAX" position. Check that red lamp (see arrow) is not lightening (check the bulb with the switch "lampetest"). When you have finished your work, take the sash to the lowest position and turn the switch to "MIN" position.
- Choose your working position (sitting or standing) based on the risk of splashing of liquids and duration of the work to be carried out in the fume hood. Never put your head inside the fume hood.

- Place apparatus and reaction equipment as close to the center of the fume hood as possible, the fume hood generally works best in the center. Attempt to not create turbulence with the fume hood as this can result in contaminated air entering the air that you are breathing.
- Clean and wash-up after work. The fume hood should not be used for chemical or equipment storage. Flammable, corrosive, irritating liquids, chemicals, etc. must be put back in the chemical closet.
- Do not expose yourself or others to unnecessary health risks. Take great care when transporting chemicals between chemical cabinets and fume hoods.
- The amount of chemicals in the fume hood is to be limited to what is necessary for only the reactions that are to be done in the fume hood at that particular time.
- Fume hoods should be cleaned on a regular basis, whenever chemicals are spilled, and otherwise at least once a month.

A more detailed SOP for the use of Fume Hoods is available [here](#). User manual for the Zystm fume hood can be obtained in English from the HSE coordinator upon request.

7.4 Gas cylinders

- Gas cylinders should only be handled by authorized persons.
- When cylinders are being moved, the regulator valve must be removed (and valve protection should be put on).
- Gas cylinders should be transported only by means of a hand truck made for this purpose. Do not leave the bottle trolley on the ramp when you are picking up gas bottle from the gas bottle room. The ramp slopes slightly towards the yard.
- In the laboratory, the cylinder should be secured to a wall, a bench or some other firm support. Put the warning label “Gass under trykk” (compressed gas) on the door. When you remove the cylinder, the label should be removed as well.
- Make yourself familiar with the content in the MSDS for the gas you are going to use.
- Flammable gasses that are not in use should be stored at the Central Storage.



Bottles must be secured to the wall



Transport with valve protection and a bottle trolley

8. CHEMICAL HANDLING

Objectives

- Employees and students must have good work habits and attitudes relating to chemical handling.
- Staff and students will work in a safe working environment without undue risk of become ill as a result of exposure to chemicals, or being harmed by chemicals.
- Everyone has the same basic set of rules when dealing with chemicals. Everybody should expect all others working with chemicals are following the same set of rules.

Legal

- Safety Coordinator is responsible for ensuring that procedures for chemical handling are made known.
- Supervisors must ensure that safe chemical handling procedures are implemented and followed.
- All staff and all students should follow these procedures.

Procedures

- Procedures for chemical handling are provided in subsections 8.1 – 8.9

8.1 Reservations, procurement, and registration of chemicals

Ordering and purchases at the Department of Chemistry

All ordering of chemicals must go through the Department of Chemistry's Central Storage. All goods ordered via the Central Storage are delivered to the Central Storage and are registered in the central chemical register of UiO (EcoOnline). You will be notified when the goods have arrived at the central storage.

Who can order chemicals:

All permanent academic staff can order chemicals. Permanent staff must approve the chemicals students, researchers and technical employees associated with their group wish to order.

Assessment.

All chemicals should undergo an assessment before they can be ordered the first time.

- Do we have the facilities and equipment for safely handling this chemical?
- Must special measures be implemented before the chemical can be used?
- Do we have storage facilities that meet the requirements for the storage of this chemical?
- Can the substance pose a security risk (e.g. drugs)?
- What other hazards are associated with the drug?
- How do you dispose of waste?

This is performed by academic staff. The scope of the assessment depends on chemical hazards associated to the chemical in question. The chemical should be received from the supplier with the correct labeling and an appropriate MSDS sheet attached.

8.2 Receiving, using, and archiving material safety data sheets

Objectives

- The Department of Chemistry should have material safety data sheets (MSDS) readily available for all chemicals 'on site' to ensure that all persons working with chemicals can easily familiarize themselves with hazards and protective measures associated with the use of the chemical in question.
- Everyone should actively use MSDS.

Responsibility

- HSE coordinator is responsible for ensuring that procedures are made known.
- Permanent staff (supervisors) must ensure that procedures are implemented and followed.
- All staff and students must follow these procedures.

Requirements for the substance at the Department of Chemistry

- All chemicals must be registered in EcoOnline.
- Those who are responsible for providing chemicals for laboratory courses must ensure that the MSDS are available to students and kept up to date.
- Those responsible for the preparation of auditorium experiments must provide MSDS for activities that will occur in the auditorium.

Routines for procurement of chemicals

- When chemicals are purchased, the Central Storage must ensure that the MSDS is always supplied by the vendor and the electronic substance database, EcoOnline, updated.

Routines with the use of chemicals

- Persons using chemicals are responsible for reading the MSDS before they use the chemicals in question.
- When working with hazardous substances, it is the individual academic employees' responsibility to ensure that all students and researchers associated with the hazardous chemical work safely.

Search our own chemical database

The Department of Chemistry uses EcoOnline to store MSDS. EcoOnline servers therefore 2 functions:

1. Storage of MSDS as legally required.
2. Chemicals inventory list - find chemicals available in your lab. Log in to the database of your section via the EcoOnline website. Receive username and password from the section leader or from the HSE- Coordinator. [EcoOnline Login](#)

Chemicals in EcoOnline are registered in Norwegian or English, it is therefore best to search chemicals via "article number" or CAS.

You can also search MSDS via search engines ore supplier website:

- **Search engine:** "SDS CHEMICAL NAME" or "SDS cas no". Check that the document is on a reputable website and that it is not too old.
- **Merck/Sigma-Aldrich:** Search for chemical. Click on MSDS in the results.
- **VWR:** Search for chemical under "MSDS".
- **Other supplier?** Check website of company. Search for MSDS. Contact company if not MSDS is not available from the website.

8.3 Risk assessment/Safe Job Analysis (see also section 7.2)

Objective

This procedure describes how a risk assessment/ Safe Job Analysis is to be performed before new experiments involving chemicals are initiated. The procedure is designed to protect workers and the environment against accidents and harm.

Scope

This procedure applies to all persons carrying out practical laboratory experiments at the Department of Chemistry. If the experiment has been previously evaluated or there is already a SJA, then there is no need for a new risk assessment. However, one must be familiar and should re-evaluate the risk assessment, especially if some time has passed since the last time the experiment has been carried out. Personnel who will carry out laboratory work must undergo the necessary HSE training before work can begin in the laboratory. The permanent scientific staff is responsible for ensuring that all personnel associated with their activities have the necessary training before they begin working in the laboratory.

Responsibility

- The Safety Coordinator is responsible for ensuring that procedures are made known to all.
- Supervisors must ensure that procedures are implemented and followed.
- All staff and students should follow these procedures, all individuals at the Department of Chemistry are responsible for ensuring that procedures are followed. If a person is carrying out high-risk experiments, he/she has the responsibility of informing others who work nearby. Danger signs should be hung on the fume hood or the laboratory door while the dangerous experiment is being carried out.

Risk assessment

For all master's and Ph.D. candidates an overall risk assessment is to be included in their application for admission and before starting work in the laboratory. For other undergraduate laboratory courses (KJM 3010 and KJM 3020) an overall risk assessment should be included in the project description to be submitted to the student administration for approval.

In addition, anyone who does an experiment for the first time must perform a simple risk assessment/SJA before starting the experiment.

A simple risk analysis is performed by answering three simple questions.

- What can go wrong?
- What can we do to prevent it?
- What can we do to reduce the consequences if something happens?

A risk assessment should take into account the hazards associated with the chemicals to be used and the execution/management of the process/experiment. The risk assessment is to be based on MSDS, chemical literature and on experience from similar processes/experiments.

For risk assessment of an experiment, it is preferred that you use the SOP/SJA form available on the Department's [HSE website](#). The SOP/SJA should be approved by the room responsible person and a copy be sent to the HSE coordinator.

The risk assessment is to be recorded in the laboratory journal. If the experiment has been performed earlier and documentation for risk assessment is available, you may refer to this.

Simple experiments which represent no special risk when the procedure and HSE-rules are followed: write that the experiment has been evaluated, that the MSDSs are read, and that the experiment does not represent any special risks when the procedure and safety rules are followed. Check that fire extinguisher and eye flush bottle are nearby and make note of this in your journal.

The person responsible for the various laboratory courses at the department is responsible for the existence of an updated risk assessment of the course (for each experiment).

It is important that the student/researcher/supervisor together find an appropriate method for the specific experiment that is to be carried out. The method must ensure the following

- i) High focus on safety.
- ii) Minimalized risk.
- iii) Functional practicability.

High-risk experiments

When an experiment is considered to be of high risk, this should be documented and risk assessment approved by the responsible permanent academic staff before the experiment can begin. The following additional evaluation is often necessary:

- Alternative reagents: Evaluate the possibility of the use of alternative and less hazardous reagents or solvents.
- Equipment failure and reliability: In cases where special equipment and experimental set-ups are used, these should be secured against possible failure of such a power failure or loss of cooling water during the experiment.
- Additional equipment: Custom safety equipment should be used if required.
If the reaction is considered "High Risk" it must be specified in your laboratory journal that the reaction is High Risk.

8.4 Labeling of chemicals

Objectives

Chemicals should be labeled properly, so that:

- Health risk, in the event of exposure to chemicals can be assessed.
- Necessary first aid for exposure to hazardous chemicals can be implemented.
- An emergency situation can be handled in a responsible manner.
- Chemicals can be disposed of in the approved manner.

Labeling of chemicals

Labeling of chemicals that are received, stored, used and synthesized at the Department of Chemistry shall be in compliance with the Chemical Regulations (see Chapter 14).

For chemicals that are received, stored, and used on our premises, packaging and containers are to be marked in a constant manner and in a language that is understood. The labeling of chemicals shall include:

- Unambiguous chemical name.

Hazardous chemicals must also be labeled with:

- Danger symbol/Hazard pictograms
- Hazard statements (H-phrases).

Labeling solutions

The marking of solutions should as a minimum include:

- Journal number and a descriptive name.
- Responsible person's name.
- Danger symbol/Hazard pictograms

Solutions containing dangerous substances can be considered as "non-dangerous" with respect to labeling when:

- The concentration of a hazardous substance in an aqueous solution is $\leq 0.1\%$.
- pH value of solutions of caustic acids or bases are between 2-10.

Marking of internally produced substances

Labeling of packaging for internally produced substances shall be such that important information is safeguarded in the event of leakage or breakage.

The marking shall contain the following:

- Substance name and/or CAS number or chemical structure, date and responsible person.

- If there is no test data available to evaluate the classification of internally produced substances, these substances will be marked with a special danger symbol hazard designation "Unknown risk".
- Abbreviations are not allowed!

Hazard pictograms and phrases shall be included as part of labeling when

- The substance is completely acquired, analyzed and stored.
- When, for practical considerations internally produced substance are difficult to label they may be stored in a secondary packaging that is marked with hazard symbols and danger designation "Unknown risk".

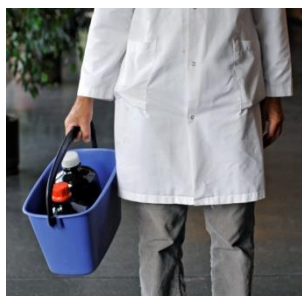
Labeling of chemical waste

Waste containers containing chemical waste must always be marked:

"Chemical Waste" and with subtitles "Organic solvents," "Acids"," Bases "etc. in accordance to the procedures for handling of hazardous waste. Labels to be used with liquid and solid waste can be found in section 15. "Documents and templates" as well as on the Department's [HSE website](#)

8.5 Internal transport of chemicals

- Hazard labels on the chemicals must be read and understood by the persons transporting chemicals before they are transported.
- Persons carrying out transportation must familiarize themselves with the information in the MSDS about the handling of spills and have access to or know about the location of suitable protective equipment, firefighting equipment and chemical spill kits before transport occurs.
- New chemicals that are transported must be in their original packaging.
- Chemical in glass bottles are to be carried in a plastic bucket which is large enough to contain all of the contents of the bottle if it is broken.
- Only one gas cylinder can be transported at a time. Gas cylinder trolleys are to be used.
- Incompatible chemicals are to be kept separate so they cannot come in contact with one another.
- When transporting cryogenics (liquid helium and nitrogen) in transport containers over 3 liters: Lock the lift (“varetransport”) with a key you get from the Central Storage (Sentrallager). The container is to be sent in the lift without personnel in the lift. Personnel are to walk up the stairs and meet the lift at its destination. When the lift is locked, nobody can call it from another floor.



Like this



Not like this

In case of chemical spill

- Secure the spill scene and get help if needed. Spill kits are located in “Emergency cupboards” on most floors.
- Keep unauthorized persons away.
- Spilled chemicals are taken care of in accordance to instructions on the substance. Evaporation of volatile liquids with flash points lower than that of room temperature can cause an explosive atmosphere. Inactivate ignition sources if possible, increase airflow, evacuate the next few rooms and inform fire crews of any explosion risk. If you cannot control the situation with available resources, call the HSE coordinator and Security Alarm Centre. Activate the fire alarm to clear the building of people if the spill is of high risk.
- All accidents and near-misses relating to the internal transport of chemicals must be reported to the HSE coordinator in writing within 3 days after the incident. Use UiO's [internal reporting](#) system or send an e-mail to the HSE coordinator.

8.6 Handling of chemicals in the laboratory

Purpose

The purpose of this article is to inform you about the most important rules for handling chemicals in the laboratory, to prevent accidents and limit the scope of the accidents. The article also includes how chemical spills are to be handled.

General laboratory work

Chemicals should be handled in such a way that a person's own and others exposure is minimized. Necessary steps to achieve this will depend on the chemical properties of the chemical in question and must be considered in each case.

- Before the introduction of new laboratory experiments, a risk assessment must be carried out.
- Only approved chemicals and properly labeled chemicals are to be used.
- MSDS for chemicals that are to be used must be read and the necessary precautions be taken before the chemicals are used.
- Personal and other protective equipment must be used according to the chemicals MSDS and the previously carried out risk assessment.
- Bench / fume hood where the work is to be carried out should be cleared of unnecessary equipment before and during work. Waste and residues of chemicals must be handled in accordance with current waste management practices.
- Minimum quantities of chemicals and solvents should be stored in the laboratory.
- All hazardous laboratory work and work where employees may be exposed to chemicals is to take place in fume hoods.
- Special attention must be paid to containers where pressure can buildup.

Special conditions

- It is forbidden to wear the lab coat in the canteen. It is recommended to hang lab coats on a suitable peg in the laboratory before going into offices or leaving the laboratory.
- It is forbidden to eat and drink in the laboratory and therefore food and implements used for eating or storing food should not be brought into the laboratory.
- It is forbidden to store chemicals in containers intended for food or that can be confused with container intended for food.
- Visitors of the laboratory will be supervised to ensure that they are not exposed to high-risk work. All visitors shall be provided with protective goggles in the rooms where chemicals are used. This provision also applies to demonstration experiments in auditoriums and other rooms.
- Hands should be washed when leaving the laboratory.

8.7 Guideline for storage of substances

Purpose

Procedure describes general guidelines for the storage of chemicals, including self-produced substances. Proper storage of chemicals reduces the likelihood that the environment is damaged by chemical, and will reduce the damage if an accident were to occur.

Definitions

- Incompatible chemicals - Chemicals that react with each other and form toxic and/or explosive compounds, gases or heat. Examples are the oxidation and reducing agents, acids and bases etc.
- Secondary protective container - Container/tank that captures emissions if the primary packaging becomes damaged. The container must be made of a durable material that will not react with the chemical being stored within it.

Procedure

General

- All chemicals should have a defined storage area separated from working areas. Storage shall be neat and orderly.
- Storage and chemical containers shall be marked with appropriate hazard symbols.
- Detailed information on requirements for individual chemicals and storage conditions labeling, can be found in the MSDS.
- All reactive chemicals should be stored in a secondary protective container.
- Chemicals that are not in daily use should be returned to its dedicated storage place.
- Chemicals that are no longer in use, and chemicals whose use-by date has expired, should preferably be removed from storage and delivered for destruction.

General requirements for storage on the laboratory

- Storage cabinets shall have floors, walls and ceiling of a chemical and fire resistant material.
- The storage cabinet should be dry and well ventilated.
- The size the secondary protective container shall be such that they at least can hold the volume of the two largest containers that are located within the protective container.
- Emergency, eye-wash, absorbent material, and fire-fighting apparatus of the correct type should be located in the immediate vicinity of the storage cabinet.
- Storage cabinets should be inspected regularly. Storage cabinets shall have signage according to regulations for safety signage.

General safety rules

General storage of chemicals shall follow the "first in - first out" rule; this is used to prevent chemicals getting too old. If the chemicals do not have their preparation date stamp on the packaging, the date of receipt can be used to gauge the age of the chemical in question.

Incompatible chemicals

Flammable materials, liquids and gases

Flammable materials, liquids, and gases are to be stored in fireproof cabinets or rooms. Containers for storage of flammable goods must be stored in a secure location. These secure locations should be easily accessible in connection with any firefighting.

Fire-resistant cabinets/refrigerators in laboratories

In laboratories, flammable substances will be stored in separate fireproof cabinets. The doors should always be closed when activities are not taking place in the cabinet. Refrigerators used to store flammable goods, shall be specially built and adapted for such purposes (ATEX approved). Fire Cabinets & refrigerators which store flammable goods shall have proper hazard labeling/-reference.

Substances with multiple hazards degrees

Some chemicals have multiple hazards. In such cases, the greatest danger is mentioned first – the order: flammable materials, oxidizing materials, acids, bases, other. Chemicals such as are both flammable and oxidizing agent should therefore be stored in fireproof cabinets.

Dry chemicals, liquids

Chemicals that are not in use are to have specified storage areas. Chemicals that are stored in laboratories are to be stored in separate shelves or cabinets. Diffusion-proof container must be used. Fluids/oils are to be stored in ventilated cabinets. Workbenches and fume hoods should not be used for storage of chemicals.

Chemicals stored in a refrigerator/freezer

- The fridge is to be used for the storage of chemicals that are temperature sensitive. Since refrigerator do not have venting, chemicals are to be stored in suitable diffusion-proof containers.
- Round bottom flasks and Erlenmeyer flasks can be used if necessary but only for a limited period (days). They must be closed and properly labelled.
- Chemicals with limited shelf life shall be destroyed when the shelf life is exceeded.
- Refrigerators and cold storage shall be annually reviewed and cleared for chemicals that will not be used in the near future.

Self-produced chemicals

Self-produced chemicals are to be stored in suitable sealed containers. The container must be labeled with the name of substance or structure, the date and responsible person.

Ethanol

Ethanol must be kept locked up.

Acids and bases

Acids and bases are stored in a dedicated cabinet that is labeled with the correct hazard symbol. Acids and bases should be kept separately, and be placed in a suitable secondary protective container.

Corrosive substances

Corrosive substances shall be kept as low as possible when stored and in all cases below head height. This is to reduce the risk of injury if the container were to tip over.

Gases

Gas bottles should be stored upright and be secured with a chain to prevent bottles from tipping over. The chain must be fitted over the bottle's center of gravity.

8.9 Facilitation of laboratory work for pregnant woman.

The routines and fume hoods in the laboratories at the Department of Chemistry will be of such a nature that those who perform laboratory work are not being exposed to hazardous chemicals, including chemicals that can harm the fetus. Nevertheless, we want these measures to be implemented such that a pregnant woman should feel confident:

- The woman must give notice pregnancy as early as possible to supervisor / manager.
- A risk assessment with respect to exposures that can be harmful to the fetus must be carried out in cooperation with the supervisor / manager.
- If some tasks involve a theoretical risk, the task should be changed or performed by others.

9. WORK INVOLVING RADIATION AND RADIOACTIVE SUBSTANCES

Purpose

Radioactive substances, ionizing and non-ionizing radiation sources shall be handled in accordance with the guidelines to minimize the risk to the health and safety of the user and other people.

Responsibilities

The Head of Department has general responsibility.

The Radiation Protection Coordinator shall see to and ensure that all work performed at the Department of Chemistry and complies with good practices for radiation protection. For work that does not involve radioactive substances and radiation in the nuclear chemistry unit, this duty has been delegated to local radiation protection coordinators who must see to and ensure that all work involving sources of radiation complies with good practices for radiation protection. Each user is responsible for following the currently applicable routines.

Definitions

Sources of radiation here include two main categories:

- Ionizing radiation sources such as x-ray equipment and electron microscopes.
- Strong non-ionizing radiation sources: lasers in classes 3B and 4, NMR machines, short-wave ultraviolet radiation (UVC), other sources of potentially harmful electromagnetic radiation.

Work with radioactive substances

Work with radioactive substances shall only be undertaken in specific laboratories in the nuclear chemistry unit/SAFE. Procedures for protection against radiation have been drawn up, and the user must be familiar with these before the work can start. Those who intend to work with radioactive substances must contact the department's radiation protection officer.

Instrumentation that requires local radiation protection coordinators

The X-ray machines used by the Department of Chemistry are fail-safe, and the primary beam is totally shielded during operation. If the machine is opened or malfunctions, the system stops immediately and no radiation is generated.

Lasers in classes 3B and 4 (high-energy lasers that can cause direct damage to the skin or the eyes). All doors leading into an area where lasers are used must be provided with a warning sign and a warning lamp which is lit when the equipment is in use. Wherever lasers are used, everybody must wear eye protection.

Instruments that generate strong magnetic fields (for example NMR instruments).

The door must have a warning sign denying access to persons with pacemakers or other metal objects implanted in the body.

Responsibilities of the local radiation protection coordinator

The local radiation protection coordinator shall:

- Ensure that manuals and SOP/SJA routines are easily available.
- HSE-manual - Department of Chemistry 04.02.2022
- Ensure supply of relevant personal protection equipment.
- Ensure that premises are provided with relevant markings.
- Ensure a specific training routine.
- Ensure that the register of approved users is updated.
- Ensure that a log of instrumentation is kept.
- Ensure that a description of measures is added to the department's emergency plan as required.
- Ensure that magnetic fields and other relevant information are identified and made easily available.
- Report any changes to the equipment stock to the department's radiation protection coordinator (who in turn reports to the Norwegian Radiation Protection Authority via UiO's central radiation protection coordinator)

10. WORK WITH GENETICALLY MODIFIED MICRO-ORGANISMS.

Purpose

All work with genetically modified micro-organisms (GMM) shall take place in accordance with the guidelines to minimize health risk and environmental impact. See the procedure for work with GMM at the Department of Chemistry and the Regulations for contained use of genetically modified microorganisms:

<http://www.lovddata.no/cgi-wift/ldles?doc=/sf/sf/sf-20011221-1600.html>.

Definitions

- Microorganisms: Any cellular or non-cellular microbiological unit which is capable of proliferating or transferring genetic material.
- Gene technology: Techniques that involve isolation, characterization and modification of genes and their implantation in living cells or viruses.
- GMM: Genetically modified microorganisms.

Responsibilities

The Head of Department has general responsibility. Supervisors/room managers have responsibility for applying for approval of premises that will be used for research/teaching involving the use of GMM. The application must be submitted to the Directorate of Health in a timely manner before such use will take place.

Contained use of genetically modified microorganisms (GMM) must only take place in laboratories for which such use has been applied for and approved in advance, within the framework for research activity involving GMM that has been reported to and approved by the Directorate of Health. The work must be undertaken and the laboratories must be designed in accordance with the Regulations for contained use of genetically modified microorganisms.

Approved laboratories. As of 30 November 2012, rooms VU 35 and VU 41 are approved for use of GMM at containment level 1 and room VU 37 is approved for use of GMM at containment level 2. Laboratories at containment level 2 must have a biohazard sign on the door. Access is granted only to authorized personnel.

Room managers/supervisors are responsible for ensuring that permission to use premises for research/teaching involving contained use of GMM has been applied for and granted by the Directorate of Health well ahead of the planned time for such use. Contact the HSE coordinator for more specific information on how to proceed. Such use shall conform to the framework that has been reported/applied for and approved by the Directorate of Health. The application is submitted on a standard form (see the website of the Directorate of Health). The room manager must ensure that all laboratories approved for contained use of GMM are supplied with a biohazard sign in accordance with the requirements set by the Directorate of Health.

Training. Supervisors/room managers must ensure that new users are familiar with and have understood the routine for work involving contained use of GMM. The supervisor shall have a protocol listing those who have received such training and the laboratory level for which they

have been authorized. The protocol is located in room VU 33. Those who have undergone such training should sign this protocol to confirm.

Risk assessment. A written risk assessment of all work with GMM must be available before such work can start. The risk assessment shall be appended to the laboratory journal of the student/researcher in question.

Work with GMM shall take place under observation of the “Security Check List – Biological Chemistry”. Use a lab coat and gloves. Never touch door handles with gloves. Never leave the laboratory area with your lab coat on.

Waste: Biologically hazardous waste must be sterilized in an autoclave before it can be handled like other types of laboratory waste. The autoclave must be cooled down and depressurized before opening. Biological waste representing less risk must be placed in yellow containers for hazardous waste.

Emergency preparedness. Spills: Disinfect immediately with 70% alcohol, found in spray cans. The cloth must subsequently be sterilized in an autoclave or placed in a container for hazardous waste, according to the level of risk. If GMM material comes into contact with the skin, it can be disinfected with 70% alcohol before washing. If GMM has been spread to areas outside the approved laboratories, this must be reported to the supervising authorities, Postmottak.5050SPBH@helsedir.no. All accidents must be reported as adverse events in UiO internally in the regular manner, see: <http://www.uio.no/english/about/hse/speak-up/>

11. ELECTRICAL HAZARD IDENTIFICATION

When using electrical equipment, ensure that:

- Power cord and plug must have no heat, corrosion or mechanical damage.
- Errors should be reported to those responsible for the room and/or equipment in question.
- If in doubt about the safety of equipment always contact the electronics workshop before you plug the equipment in.

The mains voltage in Norway is 220 volts. Wiring differs from other countries, in that the Norwegian system has no direct earth connection. Foreign electrical equipment may not necessarily be able to be connected to the Norwegian electrical system without modifications.

NOTE: Be aware of transformers that do not have electrical separation.

Exposed wiring is dangerous even when at low output voltages.

First aid for electric shock: Remove affected person from the voltage source.

If cardiac arrest: Immediately start CPR. AED defibrillator is located across the Expedition/Reception.

Anyone receiving an electrical shock needs to contact the Oslo Emergency Centre for a health check-up immediately after the incident. Please inform your supervisor and the HSE coordinator.

12. FIELD WORK

Purpose

The procedure shall ensure that fieldwork of the Chemistry Department is conducted in a proper manner and in accordance with the regulations.

Definition.

Fieldwork is collecting and / or processing of samples outside the normal workplace. This can take place both domestically and abroad. Stays at other institutions is not fieldwork. Study trips are considered to be fieldwork. The procedure applies to both staff and students conducting fieldwork.

Responsibility.

Unit manager is responsible for designating a field manager. For approved projects is project leader automatically field manager. Teaching manager is responsible for designating field responsible for teaching based fieldwork. Field Manager is responsible for the fieldwork carried out in accordance with procedure. Field Manager may delegate tasks related to fieldwork.

Procedure.

- Field Manager shall, if necessary, obtain advice of qualified personnel and ensure that participants in fieldwork make necessary preparations.
- Fieldwork should be risk assessed (not required for field trips). Field Manager is to fill out the form found under "documents and forms" on our HSE page <http://www.mn.uio.no/kjemi/om/hms/skjema/> .
- Field Manager should complete box short field manager found under "Feltarbeid" on our Safety page (Norwegian) <http://www.mn.uio.no/kjemi/om/hms/skjema/>. The risk assessment and any other documentation should be enclosed.
- Field Manager is to ensure that all participants fill out field card for field participant. This form is found under "documents and forms" on our HSE page.
- Field Manager shall deliver field card for field manager and all participants to the Ekspedisjonskontoret before fieldwork begins.

13. REPORTING OF ACCIDENTS AND NEAR MISSES.

All injuries, accidents and near misses must be reported.

See the [Department's HSE webpage](#).

The reported incident will be considered by the HSE Coordinator according to UiOs regulations

- <http://www.uio.no/om/hms/arbeidsmiljo/prosedyrer/hms-avvik/index.html> (Norwegian)
- <https://www.uio.no/english/about/hse/working-environment/procedures/adverse-events/index.html> (English)

The HSE Coordinator is to report injuries to NAV if the injury required medical treatment or if the injured person requests that the information be sent to NAV.

HSE coordinator is responsible for submitting completed injury forms to LAMU and for saving the form for use for statistical analysis and annual reporting.

The reporting of near misses and accidents is central in helping to prevent the incident from repeating itself. If anyone needs assistance in the filling out forms, please contact the HSE Coordinator.

14. REGULATIONS AND GUIDELINES

- Working Environment Act. (Internet)
[Working Environment Act \(arbeidstilsynet.no\)](#) downloadable pdf
[Act relating to working environment, working hours and employment protection, etc. \(Working Environment Act\) - Lovdata](#)
- Regulations relating to systematic health, environment and safety work in enterprises (Internal Control Regulations).
See: <http://www.arbeidstilsynet.no/forskrift.html?tid=78003>
- Radiation Protection Regulations.
See: <http://www.nrpa.no/en/legislation>
- Regulations on recycling and treatment of waste (avfallsforskriften – in Norwegian)
[Forskrift om gjenvinning og behandling av avfall \(avfallsforskriften\) - Lovdata](#)

15. DOCUMENTS AND TEMPLATES

Please find documents and templates below as well as on the HSE webpage:

<https://www.mn.uio.no/kjemi/english/about/hse/documents-and-templates/>

HALOGENATED SOLVENT WASTE

(carbon tetrachloride, chloroform,
dichloromethane, trichloroethylene,
chlorobenzene, etc.)

NON- HALOGENATED SOLVENT WASTE

(hydrocarbons, alcohols, ketones, etc.: hexane,
toluene, benzene, ethanole, acetone etc.)

AQUEOUS WASTE

Acidic

(pH > 5)

(organic substances < 1 %)

AQUEOUS WASTE

Basic

(pH>9)

(organic substances < 1 %)

AQUEOUS WASTE

Neutral

($5 < \text{pH} < 9$)

(organic substances < 1%)

SOLID INORGANIC WASTE

Inorganic salts and solids

(no inorganic acids or bases)

LABEL FOR ORGANIC SOLVENT AND OIL WASTE

Contact person:

Room nr.:

☐ Non-halogenated organic solvents

☐ Halogenated organic solvents

☐ Oil (PBC-free)

☐ Oil (containing PBC)

Additional information

☐ contains halogen

☐ contains isocyanates

☐ heavy metals (not Cd or Hg)

☐ Cd

☐ Hg



	Fraction %	Chemical compound
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

LABEL FOR ORGANIC SOLVENT AND OIL WASTE

Contact person:

Room nr.:

☐ Non-halogenated organic solvents

☐ Halogenated organic solvents

☐ Oil (PBC-free)

☐ Oil (containing PBC)

Additional information

☐ contains halogen

☐ contains isocyanates

☐ heavy metals (not Cd or Hg)

☐ Cd

☐ Hg



	Fraction %	Chemical compound
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

LABEL FOR LIQUID WASTE

Contact person:

Room nr.:

- | | |
|---|--|
| <input type="checkbox"/> Organic waste (not solvent waste!) | <input type="checkbox"/> Inorganic acid |
| <input type="checkbox"/> Organic alkaline waste | <input type="checkbox"/> Inorganic base |
| <input type="checkbox"/> Organic acidic waste | <input type="checkbox"/> Aqueous neutral |

Additional information

- | | |
|--|---|
| <input type="checkbox"/> contains halogen | <input type="checkbox"/> contains isocyanates |
| <input type="checkbox"/> heavy metals (not Cd or Hg) | <input type="checkbox"/> Cd <input type="checkbox"/> Hg |
| <input type="checkbox"/> aqueous, pH-value: _____ | <input type="checkbox"/> water content > 10% |



	Fraction %	Chemical compound
1.		
2.		
3.		
4.		
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6.		
7.		
8.		
9.		

LABEL FOR LIQUID WASTE

Contact person:

Room nr.:

- | | |
|---|--|
| <input type="checkbox"/> Organic waste (not solvent waste!) | <input type="checkbox"/> Inorganic acid |
| <input type="checkbox"/> Organic alkaline waste | <input type="checkbox"/> Inorganic base |
| <input type="checkbox"/> Organic acidic waste | <input type="checkbox"/> Aqueous neutral |

Additional information

- | | |
|--|---|
| <input type="checkbox"/> contains halogen | <input type="checkbox"/> contains isocyanates |
| <input type="checkbox"/> heavy metals (not Cd or Hg) | <input type="checkbox"/> Cd <input type="checkbox"/> Hg |
| <input type="checkbox"/> aqueous, pH-value: _____ | <input type="checkbox"/> water content > 10% |



	Fraction %	Chemical compound
1.		
2.		
3.		
4.		
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6.		
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9.		

LABEL FOR SOLID WASTE

Contact person:

Room nr.:

- | | |
|---|--|
| <input type="checkbox"/> Inorganic salts and other inorganic solids | <input type="checkbox"/> Organic solids |
| <input type="checkbox"/> Inorganic solid bases | <input type="checkbox"/> Organic solid acids |
| <input type="checkbox"/> Inorganic solid acidis | <input type="checkbox"/> Organic solid bases |

Additional information

- | | |
|---|--|
| <input type="checkbox"/> contains halogen | <input type="checkbox"/> contains Cd |
| <input type="checkbox"/> contains Hg | <input type="checkbox"/> contains other heavy metals |



	Fraction %	Chemical compound
1.		
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LABEL FOR SOLID WASTE

Contact person:

Room nr.:

- | | |
|---|--|
| <input type="checkbox"/> Inorganic salts and other inorganic solids | <input type="checkbox"/> Organic solids |
| <input type="checkbox"/> Inorganic solid bases | <input type="checkbox"/> Organic solid acids |
| <input type="checkbox"/> Inorganic solid acidis | <input type="checkbox"/> Organic solid bases |

Additional information

- | | |
|---|--|
| <input type="checkbox"/> contains halogen | <input type="checkbox"/> contains Cd |
| <input type="checkbox"/> contains Hg | <input type="checkbox"/> contains other heavy metals |



	Fraction %	Chemical compound
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