



Stockholms
universitet

Institutionen för material- och miljökemi

Work Environment and Safety Rules for Laboratory Work at MMK

Effective from: 2022-01-01

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Institutionen för material- och miljökemi

Welcome to MMK!

In this safety folder you find information about the Department, important safety rules and regulations, action plans etc. In the folder (Attachment 12.1), there is an introduction procedure/checklist, for new employees and guests at MMK.

Read the routines and regulations! If you are not going to do any laboratory work or have any contact with laboratory chemicals you can have a quick look at the last two chapters. You should then answer all the questions in the attached QUIZ, which you must leave to your supervisor or host for approval. If you passed the QUIZ it should be signed both by you and your supervisor/host.

By your signature, you assure that you will follow all the required safety rules and regulations during the time you will spend at the MMKs premises.

You should leave the "approved QUIZ" with both signatures together with information about your nearest kin/relative to the administration office/janitor at MMK as soon as possible.

When you are **leaving MMK** after your stay, you are obliged to fill an assurance form in the back of this folder and hand it over to the administration office signed by you and your supervisor/host (Appendix 12.12). The contents in this folder is also available at MMKs Webpage, <http://www.mmk.su.se/about-us/my-department/work-environment/lab-safety>.

Prefekt/Head of Department, MMK



Code of conduct for employees and students at MMK

There is a zero-tolerance at Stockholm University when it comes to harassment, sexual harassment, victimization and other forms of misconduct.

- I have read and understood the ethical guidelines at Stockholm University, see links below.
- I understand that all students and employees at the Chemistry Section have equal rights, possibilities and responsibilities regardless of gender, gender identity and expression, ethnicity, religion or other beliefs, physical disabilities, functional variations, sexual preference and age.
- I will show respect in regards to other people's differences, opinions, and my actions will be characterized by tolerance. I will contribute to a respectful and inclusive work and study environment that is void of harassment, sexual harassment, discrimination or derogatory behaviour.
- I am aware of that discrimination, as defined by the law (SFS 2008:567), such as harassment, sexual harassment, discrimination or derogatory behaviour and violation of the Chemistry sections Code of Conduct may result in disciplinary action.
- I have, like every student and employee, a responsibility that in all my interactions, treat others with respect, and I will actively contribute to a safe and unbiased study and work environment. Specifically, I will discuss without personal attacks, and that I will convey criticism in a constructive manner that contributes to a positive work environment.
- I will always lead by example and have a professional attitude in my interactions and communication. Derogatory jokes or aggressive comments do not belong in a stimulating study and work environment. Neither do they belong in e-mails, course evaluations or any other study-related activities such as student pubs, open lectures, study visits and meetings organized by the student union.
- For PhD students; I am conscientious about clearly accounting for the material used in texts submitted for examination (see link to guidelines below).
- For PhD students and scientists; I am aware about the rules for 'good research practice' and deviations from it in the form of fabrication, falsification or plagiarism. (See link to full text below).

Further material to read:

Ethical guidelines at Stockholm University:

<https://www.su.se/staff/personnel/working-environment-health/harassment>

Chemistry section's ethical guidelines:

<https://www.kemi.su.se/english/education/ethical-guidelines>

Good practice and misconduct in research:

<https://www.su.se/english/research/research-ethics/good-practice-and-misconduct-in-research-1.332325>

General information:

<https://www.su.se/utbildning/studera-vid-universitetet/dina-rattigheter-och-skyldigheter/jamlikhet-och-lika-villkor-1.445658>

I hereby declare that I have read and understood the above **Code of conduct for MMK** and will comply with the contents.

.....

Place and date

.....

Signature

.....

Name in letters (text)

2. Emergency numbers (*Section for Safety and Security*)

See on MMK's web page:

<http://www.mmk.su.se/my-department/work-environment/lab-safety>

www.su.se/samir

3. General Safety Regulations and alarm systems at MMK

Description of MMKs facilities and activities

MMK is one of the largest departments at Stockholm University and has within Arrhenius Laboratory, five units: **Materials Chemistry, Analytical Chemistry, Inorganic and Structural Chemistry, Physical Chemistry** and the **Chemical Practice Laboratory (KÖL)**, an independent unit administrated by MMK.

MMKs facilities in house C, A and house K, where we do research work, teaching at basic and advanced level and administrative work, are distributed over four floors (**levels 2, 3, 4, 5**). The corridors at each level are divided into two parts, north and south, separated by a staircase. Of the about 170 persons working at the department, about 60 are PhD students or post-docs. There are offices and laboratories on all floors. The access to the premises is via an access card system (card reader) or via a door bell/telephone.

Safety regulations for MMK

The Head of the department has overall responsibility for ensuring that all personnel is informed of, and complies to, current safety regulations.

Researchers/supervisors are responsible for making sure that their PhD students, guest researchers, post-docs, and diploma workers, are informed of, and follow, the current safety regulations.

Active teachers are, together with course assistants, responsible for ensuring that the students on undergraduate level follow the current safety regulations.

Assurance: All employees, PhD students, students doing diploma works, post-docs and guest researchers are obliged to sign an **assurance form** that they have taken part of the general safety regulations of the department, work environment and fire protection regulations.

All persons performing laboratory work at the department must assure that they have taken part of and follow the *Notifications of incident or injury at work etc. (SAMIR)*, *Laboratory safety directives* and *Personal Safety equipment directives* effective for MMK. They also have to pass both QUIZ's and leave them correctly signed to the administration office/janitor.

Sound or flashing light alarm systems:

1. Fire alarm - Siren You must evacuate immediately. **Close the doors** if they do not close automatically! When the fire alarm sounds, evacuate immediately the premises following the instructions in the *Fire Protection plan*. Gathering point is approximately 100 m out on the lawn from the main entrance (south) to the Arrhenius Laboratory House C.

The evacuation officers are responsible for making sure that all personnel leave the premises – see the *Fire Protection plan* or the notice boards on each floor.

2. Ventilation alarm - Flashing yellow light in the corridor indicates that the fume hood ventilation does not work satisfactorily. Abort work in the fume hoods, pull down the fume hood sashes and leave the lab.

3. Burglar alarm (Door alarm) - Siren is activated locally outside office hours. Investigate the reason and if necessary, call the Stockholm University alarm services: 08-16 42 00.

If you tripped the alarm by accident: Remain on spot until the safety guard arrives!

There is also door alarm at the NMR-lab (siren) and burglar alarm outside the room C535a (white flashing light).

4. Emergency alarm (toilet for disabled persons) - **Siren** (sounds locally, not connected to alarm centre).

Silent alarms:

Elevator alarm is connected to Akademiska Hus and alarm centre, with communication to the elevator, see *Emergency numbers*.

Assault alarm is installed in some rooms at MMK and connected to the alarm centre.

In case of water leakage or gas leakage

Everyone must know where to turn off water or special gases. The shut-off valves are found in the shafts, but are only to be used in case of emergency and usage needs to be reported to SU-shop or Akademiska Hus.

It is prohibited to turn on any valves (if turned off). Instead, contact SU-shop or Akademiska Hus for the re-opening of gas-valves.

Personal injuries

All personnel are obligated to report accidents and material damages, to the safety officer, the head of the department and the work environment manager. Use the SAMIR system; see *Notifications of incident, injury at work etc.*

Report also incidents that do not result in personal injuries because that helps to discover and address risk situations.

It is compulsory to report accidents!

(www.su.se/samir). Choose SAMIR from the list.

Emergency ward

Contact Danderyd's hospital (08-655 50 00).

For eye injuries, contact St. Erik's hospital, Polhemsgatan 50 (direct number: 08-672 31 00).

Swedish Poisons Information Centre/Giftinformationscentralen

<https://giftinformation.se/kontakta-oss/>

See also under *Laboratory safety directives*

Prefekt/Head of Department, MMK

Institutionen för material- och miljökemi

4. Fire Protection Plan

In the event of fire and risk of explosion:

Evacuate and alarm (fire brigade 112) !

In case of minor fire events:

Rescue, Evacuate, Alarm!

(Extinguish)

Fire safety organisation at MMK

<http://www.mmk.su.se/about-us/my-department/work-environment/lab-safety>

Fire safety director MMK	Gunnar Svensson
Manager of flammable goods	Claudia Möckel
Deputy of flammable goods	Anne Ertan
Manager of flammable goods	Jakob Norinder (KÖL)
Fire safety inspector	Kadir Abdul Karim
Deputy Fire safety inspector	Zoltán Bacsik

Evacuation officers:

House C Floor 5	Jakob Paulin, Kadir Abdul Karim Christer Degerstedt
House C Floor 4	Daniel Emanuelsson-Paulson Zoltán Bacsik
House C Floor 3	Aleksander Jaworski
House C Floor 2	Kjell Jansson
House A Floor 3	Emilia Eklund, Anneli Kruve, Tim Åström
House B Floor 2	Claudia Möckel
House K Floor 2	Guillaume Bousrez, Miao Zhang

KLARA-system:

KLARA responsible at MMK	Anne Ertan, Mirva Eriksson
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Alert list

Rescue services	112	
Gunnar Svensson	08-16 4505	070-568 8361
Camilla Berg	08-16 1255	076-318 6919

Technical Fire Safety measures/documentation

All corridors, but not the laboratories, have fire alarms, posted evacuation plans, fire blankets and fire extinguishers.

All wet chemistry labs are equipped with emergency showers and emergency eyewashes.

Flammable items are stored in ventilated cupboards or in spark safe refrigerators and freezers.

Mixed storage of acids, bases, toxins and flammable liquids is to be avoided as far as possible.

Binder with the following information is kept at the administration office on floor 4 and in digital form at the office of the Fire safety inspector:

- (1) Drawings showing the placement of fire extinguishers, firefighting units and fire posts
- (2) Drawings showing the fire cell borders
- (3) Drawings showing emergency showers and emergency eyewashes
- (4) Drawings showing the placement of gas cylinders
- (5) Documentation concerning staff training
- (6) Lists/drawings of the rooms where flammable goods are stored
- (7) Drawings of closed X-ray sources

Fire safety regulations

- Escape routes must be accessible (without key)
- Fire extinguishers must not be blocked
- Gas cylinders must be secured and the facility provided with a warning pictogram and a list of the gases
- The main part of the staff must have had fire protection training
- All new staff must be informed of the fire protection regulations
- Recurring fire information is to be given at staff meetings
- Fire protection control rounds are to be performed regularly
- Inventory of flammable goods is performed annually

Use and handling of flammable goods in the labs

Flammable goods (solvents, gases, reactive flammable substances) have to be handled and stored according to special rules, see *Laboratory safety directives*.

Fire safety check-list

Persons responsible for laboratories (Lab Hosts)

- Continually oversee the storage of flammable solvents/chemicals and minimise their spread
- Make sure that empty solvent containers are removed
- Continually check the anchoring and connection chains of gas cylinders
- Make sure that the destruction of chemicals is performed according to the rules
- Report problems to the fire safety inspector and/or director

Fire safety inspector

- Annually take inventory of flammable goods at MMK
- Systematically check evacuation routes and fire doors
- Check fire extinguishers, storage of flammable goods and placement and connection chains of gas cylinders every other month
- Check documentation of emergency showers (once per quartile) and emergency eyewashes regularly (once per quartile)
- Check the documentation of the control of fume hood function (once per quartile)
- Check the documentation of the amounts of flammable goods and staff training in fire protection and first aid

Prefekt/Head of Department, MMK

5. Crisis plan - MMK

Our main address: Svante Arrhenius väg 16 C

Crisis plan for Stockholm University

The purpose of the University's crisis plan is to prepare cohesive, clear crisis management and define routines for a response to serious incidents, concerning everything from the department/unit concerned, a person or the entire Stockholm University. More information is found at <https://www.su.se/medarbetare/råd-stöd/säkerhet-krishantering> .

Important phone numbers (see also *Emergency numbers*)

Emergency (ambulance, fire brigade, police, poisoning, doctor)	112	
Security unit/Security personnel (universitetsväktare)		
	During work hours	08-16 22 16
	After work hours	08-16 42 00
	Reserve nr	08-15 42 00
Laboratory Safety Coordinator (FA)	Mikael Corell	070-3338619
Akademiska Hus (house manager)	house problems	020-552000

MMKs crisis organisation:

Crisis co-ordinator at MMK

Camilla Berg 08-16 1255/076-318 6919 camilla.berg@mmk.su.se
(Compiles and updates relevant list of e-mail addresses and phone numbers, keeps contact with security unit)

Persons to contact at MMK in case of emergency:

See on MMK web page

<http://www.mmk.su.se/about-us/my-department/work-environment/lab-safety>

Scroll down web page for .pdf file

6. Environment - Action plan

See on MMKs web page

<http://www.mmk.su.se/about-us/my-department/work-environment/action-plans>

7a. Work Environment and Equal Treatment Organization - MMK 2021

See on MMKs web page

<http://www.mmk.su.se/about-us/my-department/work-environment/lab-safety>

Scroll down web page for .pdf file

Work Environment and Equal Treatment Group - MMK 2021

Anne Ertan (chair, work environment, equal treatment)

Gunnar Svensson (Head of department, work environment floor 4 equal treatment)

Mattias Edén (work environment Physical chemistry)

Mirva Eriksson (Deputy Work environment)

Kjell Jansson (evacuation officer)

Jakob Paulin (technical workshop, evacuation officer)

Kadir Abdul Karim (Fire protection, Deputy Work environment)

Tatiana Bulavina (Administration, Economy)

Christer Degerstedt (evacuation officer)

Zoltán Bacsik (Deputy Fire protection, evacuation officer)

Baltzar Stevansson (safety officer, environmental delegate)

Ulrika Nilsson (work environment Analytical chemistry)

Claudia Möckel (Flammable goods director, evacuation officer)

Irina Terekhina (PhD delegate)

Mikhail Ivanov (Deputy PhD delegate)

Jakob Norinder (safety officer, evacuation officer, Flammable goods director KÖL)

Helena Bergman (work environment KÖL)

7b. Work Environment and Equal Treatment Group - Action Plan (in Swedish)

See on MMK's web page

<http://www.mmk.su.se/about-us/my-department/work-environment/action-plans>

8. Rules for computer usage at MMK

Cyber Security Awareness

The Internet is a great resource but also a hostile place. There are thousands of worms and viruses on the Internet that continuously attack your computer indiscriminately. Furthermore, hackers are often simply after your computer as a stepping-stone to launch more attacks against other computers. Even though you may feel that there is no information of value on your computer, the costs of cleaning up a computer security incident, the potential for lost information and loss of productive work time are significant.

Cyber Security is the primary responsibility of each individual. That means you are the person responsible for the security of those systems you use, manage or maintain. The Internet is the number one conduit for infecting computers with malware. **Phishing** attacks are common, often with carefully targeted e-mails designed to compromise your computer and/or deceive you into providing your username and password.

Stockholm University's rules for computer use can be found in SU's regulations <https://www.su.se/staff/it/it-support-systems>.

The rules are applied at MMK with the following amendments and clarifications:

- In the e-mails that you receive consider following:
 1. Are you familiar with the sender or do you trust the sender?
(Be critical)
 2. Do you know or have any affiliation with the organization the sender represents?If your answer is **No** to either of these questions, just delete the message.
- A real message from SU's IT-support with a warning that your mailbox is almost full will **never ask for your username or password. Do not open any attachments that you were not expecting.**
- No changes in the department network, servers, or general hardware, can be made without the permission of System Administrator at MMK or the head of the department.
- Only approved computers (purchased by the University) can be connected to the department's local network (LAN). The computer hardware must not be altered without System Administrator's approval. There are computers available for rent at MMK. If of any interest, notify System Administrator at MMK (good time in advance).

SU provides a wireless network available to guests with their own laptops when they have been issued an SU-account or IT-access card (from System Administrator). The card gives temporary wireless access to internet or access via the public network connectors at SU.

- Only software approved by the department can be installed on your work computer (this also applies to "translation programs" from the Internet). Updates of licensed software will take place automatically over SU's network. Never accept a download e.g. of free antivirus software from the Internet.
- Be careful when connecting a work computer (laptop) to the Internet at home or when travelling. Hand in the computer to System Administrator for an update of the antivirus software before going on longer journeys. If you suspect infection, hand it in again afterwards for control.
- All private correspondence on your work computer should be kept in a folder marked "Private", to avoid unintentional mixing with work related material and to keep integrity.
- The department accepts reasonable amounts of private e-mail communication and Internet use, as long as it follows laws and regulations, does not compromise the computer safety at the department, does not interfere with or override work, or creates significant additional work load for other staff.

<ul style="list-style-type: none">• NEVER reveal your login information or password as a response to an e-mail request!
--

- Your SU-account with a secret password is a valuable document that has been entrusted to you personally. If you suspect that your login has gone astray, immediately contact the system administrator to acquire a new login. Lending your personal account information to someone is prohibited and leads to suspension.
- Do not waste bandwidth, computer power or research funds - others might need it more. Violations of rules can lead to suspension, shorter or longer.
- All supervisors or hosts should in good time, if possible at least two weeks before arrival, register new employees and guests. A form can be found at the MMKs intranet <http://www.mmk.su.se/about-us/my-department/register-new-guest> . As soon as possible, notify any changes in the time for the stay of the guest. Supervisors and hosts should also make sure that new co-workers/guests have got and noticed the above information.

Prefekt/Head of department MMK

9. Notification of incident or injury/illness etc.

Notification of incident/injury at work or environmental improvements

is done via SAMIR, *Safety-Work Environment-Environment-Reporting*. Work injury must be reported within 24 h. You can reach SAMIR via www.su.se/samir.

Knowledge of crimes, incidents, accidents and working or external environmental problems is of immense value to Stockholm University. The information you can provide is a key part for prevention of crime and thefts.

Do you want to report an incident or an injury/illness at work?

In SAMIR, follow the link, fill in the form and "Submit report". Your report will be dealt with by Human Resources and the Section for Safety and Security, who provide you with feedback by email or telephone.

In the event of an emergency or life-threatening situation, always call 112 first!

Then contact the Section for Safety and Security on 08-16 22 16 (daytime) or the university's security guards on 08-16 42 00 (other times, via Tempest emergency call center).

Police report

Section for Safety and Security is to be informed about crimes on site. A safe and secure environment requires active participation in safety work by all staff and students.

Do you want to submit a police report? In SAMIR, follow the link, fill in the form and "Submit report". Section for Safety and Security will deal with your report, ensure it reaches the police and provide you with feedback.

Suggestions for improvements and environmental non-conformance reporting are the drivers of Stockholm University's Environmental efforts, leading to development and the correction of omissions and errors. Environmental non-conformances arise when established environmental procedures or legislation are not followed.

Do you want to make a suggestion for improvement or report an environmental non-conformance?

In SAMIR, follow the link, fill in the form and Submit your report.

10. Personal safety equipment in the laboratory

Regulations for employees at MMK and guest researchers, trainees and others that are using MMKs premises:

During chemical laboratory work or handling of chemicals:
Protective clothing (lab coat) and protective glasses must be used.

Organic solvents or other **toxic substances** with high vapour pressure must be handled¹ with gloves of suitable resistant material, in a fume hood.
Fine-grained powders must be handled in a fume hood.

Personal safety equipment in the lab also includes:
Emergency eye-wash, first aid kit, fire blanket, emergency shower and fire extinguisher.

A person working in a lab must know:

- where the safety equipment is located in the laboratory and how they are used
- where the exit routes are in the event of fire
- the meaning of the different alarm signals

Use of

- **Emergency eye wash/eye wash bottle:** Flush with water for at least 15 min. with open eyes. Contact lenses should not be used in lab! It is recommended to seek medical assistance. (Bring information about the chemical in question).
- **Fire blanket:** The person, whose clothes are on fire, is put on the floor. The fire is suffocated with the fire blanket, starting from the head down or use emergency shower.
- **Emergency shower:** Is preferably used *after* the fire blanket, as a complement.
- **Fire extinguishers:** In the case of fire in *electrical equipment* and in *solvents*, a Carbon dioxide (or powder extinguisher) should be used.

¹ A risk assessment must be performed in KLARA-system, see *Laboratory safety directives*, where the project leader/supervisor, together with the trainee/student, decides in advance the most suitable handling routines for each operation in the lab project. The risk assessment is approved in KLARA, printed and signed by the supervisor and is kept in the actual lab in a Risk assessment binder.

Prefekt MMK/ Head of MMK

11. Laboratory safety directives

Institutionen för material- och miljökemi

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Abbreviations

AFS: The Swedish Work Environment Authority's Statutes (Arbetsmiljöverkets förordningar)

Group A- and B-chemicals: Chemicals that require a permit to be used, according to AFS 2014:43

KLARA: Tool for registration and risk assessments of chemicals

1. Safety regulations concerning laboratory work

1.1 Risk assessment

When planning laboratory work where one or more hazardous compounds, such as poisonous, flammable, explosive chemicals are used or formed, you must perform a risk assessment (AFS 2014:43). The risks of accidents and health hazards that may arise must be identified and assessed. Based on the risk assessment, you identify the risk-reducing measures that are necessary to ensure that the work can be performed in a safe manner. Before starting the laboratory work, the identified risk-reducing measures must be taken and preparations for appropriate actions in case of an accident must be made.

Handling of chemicals with unknown properties should be made as if the chemicals are hazardous, considering the properties that may be unknown. The systematic risk assessment is performed using KLARA where safety data sheets and other information about the chemicals are available <http://www.su.se/medarbetare/it/stodsystem/klara> (log in with your SUKAT credentials). The printed document with a description of the work, the risk assessment and the risk reducing measures, should be kept in a binder in the lab. The heading of the risk assessment document should be as informative as possible for the planned experiment. The risk assessments of students must be signed by the supervisor or project leader (delegated from the head of the department) and are kept in the Risk assessment binder in the Lab.

1.2 Working single

Working single in a laboratory refers to a situation where one is **alone** at the premises with difficulty to get rapid assistance if needed. The purpose with the regulations is to avoid such situations where a small accident in the laboratory could give serious consequences because rapid help is not available. As long as someone, by agreement, can be easily reached in a nearby office or laboratory, it is not regarded as working single.

Working single is not allowed in MMKs laboratories after 20:00 and before 8:00 in the morning, and not on Saturdays, Sundays or holidays!

The supervisor or the person responsible for the work environment in the unit can allow exceptions if there are special reasons. A special reason may be that the risk assessment shows low risk for a simple work procedure in a chemistry laboratory in connection with electron microscopy, X-ray diffraction, NMR-, HPLC- or MS-measurements. The permission for working single off-hours must be **in writing** and be available in the chemistry laboratory where the work is performed.

1.3 Laboratory work

A person working in a lab should always:

- Wear protective glasses and lab coat in the laboratory (**but not outside lab**)!
- Keep lab benches and fume hoods free from superfluous glass items and chemicals and minimize the amount of chemicals
- Know where the first aid stations are located
- Know where fire extinguishers and emergency showers are located, and how to use them
- Know the exit routes in the event of a fire
- Know the meaning of the different alarm signals, see *General Safety Regulations*

A person working in a lab, prior to and during lab work should:

- Carefully study the safety regulations and risk assessments concerning the work procedures and the properties and toxic effects of compounds included in the experiment.
- Make a risk assessment in KLARA if there is not a previous risk assessment available. Risk assessment must be **individual for** each person if **CMR substances** are used in the experiment.
- Have appropriate antidotes available ready to render poisons or corrosive compounds harmless.
- Notify surrounding colleagues in the lab when work with larger amounts of flammable or toxic compounds is taking place.
- Thoroughly master the experimental method and always use the amounts and proportions recommended by the supervisor.
- Consider the course of the experiment and the counter actions that might be necessary if it turns out differently.

A person working in a lab, after the experiment should:

- Immediately after use, return remaining quantities to appropriate storage, e.g., poison cupboard, solvent cupboard and chemical cupboard. The amount of chemicals on the lab benches should be kept to a minimum.
- Handle and destroy waste in an appropriate manner according to Waste regulations. Contact your supervisor if something is unclear.

Personal safety equipment in the laboratories - See tab 10.

1.4 Registry of chemicals and solvents

Each unit or project group appoints a person responsible for taking chemical inventory. This person keeps a registry of the chemicals and solvents of the unit/group, for update in KLARA. Barcoding of new chemicals is also done via inventory officer. Printouts of these records in KLARA can be acquired from the inventory officer. Inventory of all chemicals is performed annually at the department and the registry is updated during January and February every year. The administrator for the KLARA-system at the department is Anne Ertan.

1.5 Storage of chemicals

Chemicals hazardous for human health and the environment should be stored so that health and environmental risks are prevented. They should be stored in an orderly fashion in not too crowded, suitable cupboards. Light sensitive chemicals should be stored in the dark, temperature sensitive chemicals cool and explosive chemicals embanked. Ethanol should be stored in locked cupboards. Compounds that require a permit and e.g. radioactive chemicals and other regulated chemicals, such as carcinogenic, mutagenic, reprotoxic and poisonous compounds should be handled and stored away from unauthorized persons, according to special rules (see e.g. *Appendix 12.3*). Different types of chemicals listed below which, when combined, can cause increased risks and should be stored separate.

- Flammable (flammable gases, liquids and substances)
- Explosive
- Corrosive (acids and bases should be kept separate and below eye level)
- Halogenated
- Oxidizing
- Toxic

Ammonium nitrate (> 80 %) should be stored separate from acids, (hypo-) chlorites/ates/ides, permanganate, sulphur and copper/salts.

Low-nitrate nitrocellulose (e.g. old films) and **reactive peroxides** should be handled as flammable products.

1.6 Some hazardous chemicals

Bromine is a volatile liquid with corrosive fumes (fume hood, use safety equipment!). Spilled bromine is rendered harmless with *sodium thiosulfate solution*.

Cyanides, especially HCN, KCN and NaCN are very toxic. To render cyanides harmless, you dissolve the compound in water (in a fume hood), and add iron ions in excess. The iron ions form complexes with the cyanide ions and this solution can without risk be flushed down the drain. A hydrogen cyanide concentration below 10 mg/m³ is harmless. The formed gas can easily be aired out.

Ethers may form peroxides when stored, in particular in the presence of light. Therefore, ethers, e.g. diethyl ether, dioxane, di-isopropyl ether, MTBE and tetrahydrofuran, should always be **checked for peroxides**: The ether is shaken with acidic KI-solution in a test tube. The mixture turns brown in the presence of peroxides. **There are also commercially available test sticks for this purpose (SU-shop)**. Ethers with peroxides should not be used!

Note: Only peroxide-tested ethers are accepted as solvent waste for destruction. Peroxide free ethers can be evaporated in a fume hood.

Method for purifying ethers from peroxides: Iron (II) sulphate (6 g) and conc HCl (4 mL) is added to water (10 mL). This solution should suffice for 1 L ether. The ether is shaken with the solution in a separation funnel. Do not forget to open the funnel immediately after shaking, to avoid pressure build-up. The ether is then tested for peroxides again and the treatment repeated if necessary.

HF: See Appendix 12.2.

Isopropanol can also, when stored for a long time or exposed to light and/or air, form peroxides. Tests and handling, see procedure for ethers above.

Methyl iodide (bp 42 °C) is an allergenic and methylating compound and should be treated with greatest care. Methyl iodide is destroyed with *ammonia: ethanol 1:1*. Contaminated equipment should be cleaned immediately!

Fine-grained powders, even from compounds, which are not classified as particularly toxic, pose a health risk because of their *tendency to form dust clouds*, which are easily inhaled by people in the vicinity. Hence, you must, also during careful handling such as weighing etc., take necessary precautions, e.g., use respiratory protection. Compounds with particle sizes in the *nm*-range can be very harmful and may only be handled in accordance to specific instructions. Further, also consider that fine-grained metal powders often are **pyrophoric**, i.e., they react so quickly and exothermically in contact with the oxygen of the air that they catch fire.

Alkali metals. Sodium is neutralised with 95 % ethanol. Place the sodium metal in small pieces in a three-necked round-bottomed flask. A suitable mineral oil should cover the surfaces of the metal. The content in the round-bottomed flask is then flushed with nitrogen gas and 13 mL ethanol/gram sodium is added in a rate that creates a rapid reflux.

Please note that the reaction should be performed in a fume hood, considering the risk of explosion! Remove spark sources! The solution is then stirred and heated with a heat mantle until all the sodium is dissolved. The heat source is then turned off and the same volume of water is added in a rate that creates a mild reflux. The solution is then chilled and neutralised with sulfuric acid or hydrochloric acid before it is flushed down the drain. Flush with a lot of water afterwards. For lithium,

use the same procedure but use 30 mL of ethanol/gram lithium instead. For potassium, use the same procedure but replace ethanol with the less reactive solvent *tert*-butanol in a proportion of 21 mL *tert*-butanol/gram potassium.

Metal hydrides can mostly be deactivated by slow addition of methanol, ethanol, *n*-butanol or *tert*-butanol (in order of decreasing reactivity) to an ice-chilled solution or suspension of the metal hydride in an inert solvent such as diethyl ether, tetrahydrofuran or toluene, under nitrogen atmosphere in a suitable vessel. A specified procedure must be developed, based on the specific reactivity and flammability of the metal hydride in question. The product must, after deactivation, be handled as hazardous waste.

Special regulations for health hazardous chemicals: See *Appendix 12.3* and in KLARA.

1.7 Personal injuries

All personnel are obligated to report accidents but also incidents that do not result in personal injuries or material damages, to the safety officer, the head of the department and the work environment manager. Reporting is performed in SAMIR (MMKs web page) See: *Notifications of incident or injury/illness etc.* Work injury must be reported within 24 h.

It is compulsory to report accidents in www.su.se/samir . See *Emergency numbers*.

Emergency ward: contact Danderyd's hospital, 08-655 50 00.

Eye injuries: Contact St. Erik's hospital, Polhemsgatan 50, 08-672 31 00.

Swedish Poisons Information Centre/Giftinformationscentralen

<https://giftinformation.se/kontakta-oss/>

Burns: If possible, remove clothing from burned body parts. Bear in mind that synthetic materials can melt and adhere to the skin! **Rinse with large amounts of water for at least half an hour!** In the case of burn injuries, the risk of shock is great.

Shock: A person who has been subjected to extensive burn injuries, corrosive substances, electric shock, poisoning or major blood loss, can get considerable disruptions in the blood circulation. Shock can be recognized by the following symptoms: paleness, cold sweat on the forehead and palms, cold chills and nausea. A person in a state of shock should be placed in a warm room with fresh air, but not in a cold draft (i.e., do not open the window if it is cold outside). The respiratory tract must be kept unobstructed (three quarters' prone position). Keep the injured person warm with blankets or similar until the ambulance arrives. Shock prevention: **warmth, rest, ventilation and gentleness.**

Inhalation of toxic gases (HCl, Cl₂, Br₂, phosgene, diazomethane, nitrous gases, H₂S, CO):

Rest, fresh air, warmth. Mouth-to-mouth resuscitation only in the event of respiratory arrest.

Cl₂ and Br₂: inhalation of ethanol or water vapour.

Nitrous gases: inhalation of fumes of ammonium hydrogen carbonate.

H₂S, CO: artificial respiration (mouth-to-mouth resuscitation).

Seek medical assistance!

Injuries to the skin:

Corrosive acids or bases: Rinse with lots of water for a long time (over 30 min). Continue rinsing during transport to hospital and in the waiting room. Strong bases often give worse injuries than acids.

Bromine: Wash with thiosulfate solution (5 %), thereafter, rinse with a lot of water.

HF: See *Appendix 12.2*.

Ingested poisons

Cyanides: Provoke vomiting. Artificial respiration and transport to hospital as soon as possible.

Seek medical assistance!

Corrosive compounds and petroleum products: Do **not** provoke vomiting. Drink a lot of water (or milk) or a suspension of MgO in water.

1.8 Fire protection in the lab

For a detailed description of fire safety organisation and protection, see: *Fire Protection Plan*.

In the event of fire with risk of explosion: Evacuate, Alarm (call 112)!

When the **evacuation alarm** (siren and/or ringing bells) sounds, the laboratories are to be immediately evacuated (follow the instructions of the evacuation officer).

All fire doors will automatically close.

It is absolutely prohibited to re-enter the laboratories.

After evacuation: gather on the grass lawn outside the southern entrance (see evacuation plan).

In the case of a smaller fire in your lab, Alert, Rescue, Alarm, Extinguish!

Try to extinguish the flames with carbon dioxide extinguisher.

Burning chemicals

Turn off the gas. Put out all flames nearby with carbon dioxide extinguishers. Remove everything flammable, especially flammable solvents.

Fires in small vessels

Suffocate the fire using a wooden board, fire blanket or similar.

Burning clothes

Use the emergency shower or place the person on the floor and roll him/her in a lab coat or a fire blanket.

Fire prevention

Solvents with low flashpoints, ether, petroleum ether and carbon disulphide must not be heated directly on a hot plate, heat instead in a pre-heated water or oil bath.

Easily oxidized compounds, alkali metals and some metal hydrides react violently with water whereby an extremely flammable gas (hydrogen gas) is formed, which might self-ignite. Handle under inert atmosphere (e.g., in a glove box) and protect against moisture. No protic solvents (ROH) may be used or opened together with the metal hydrides in the glove box. Only hydrophobic materials may be used when cleaning containers. In the event of a fire, use sand, carbon dioxide or dry powder fire extinguishers. Do not use water. If there is a fire, carbon monoxide and carbon dioxide can be formed. In the case of a larger fire, breathing protection, which is independent of the surrounding air, should be used.

Flammable liquids, should be stored cold in sealed refrigerators and freezers, marked "Explosionssäkert" (Explosion safe). **All items put in refrigerators and freezers must be clearly marked with content and responsible person, both on the container and a separate note.** In the freezer, text written with a marker is often smudged, so use a pencil or a labelling device.

Carbon dioxide extinguishers and fire blankets should be found in all corridors and in every chemistry lab. Water fire extinguishers are located in the corridors, where also shut-off valves for the gas can be found. Automatic fire alarms, directly connected to the fire department, are installed in the corridors, manual fire alarm actuators can be found in respective ends of the corridors. Supervisors and/or safety officers will inform new employees/diploma workers about fire protection. Carbon dioxide fire extinguishers and fire blankets are located in the corridors and in every wet-chemistry lab.

1.9 Handling of liquid N₂

Liquid nitrogen handling involves risks of accidents and ill health. In order to limit the risk of injury at the workplace you must do a risk assessment and have written handling and protection instructions that are adapted to the workplace (lab) in question in place.

Liquid nitrogen work must only be carried out by those who have sufficient knowledge of the risks that can arise from handling and use, and how they can be avoided. The nearest manager shall ensure that the employees

handling liquid nitrogen have knowledge of the risks and have been informed of the local handling and protection instructions. Equipment/containers used in liquid nitrogen handling shall be designed in accordance with AFS 1997:7 with regard to material selection and safety devices (Appendix 12.5).

2. Handling of laboratory waste

Stockholm University has given instructions for waste management procedures such as General instructions, and instructions for office activities and for laboratory activities.

In general, waste is classified as Household waste, Industrial waste or Hazardous waste.

Examples of industrial waste: **glass containers, laboratory glass, laboratory plastic, etc.**

Examples of hazardous waste: **chemicals, electronic-waste, antibiotics, radioactive waste, etc.**

The text below is from the document: *Waste management procedures for Stockholm University*.

<https://www.su.se/staff/organisation-governance/sustainable-campus/how-to-do/waste-management/laboratory-waste>

2.1 Chemicals

Classification/sorting

In principle, chemical waste is classified as hazardous waste/goods and liquids and must not be poured down drains, except as described in the directives made by the university, see:

<https://www.su.se/staff/organisation-governance/sustainable-campus/how-to-do/waste-management/laboratory-waste>

Handling/storage

The same requirements apply to the storage of chemical residues as to pure chemicals. Chemical residues for destruction and pure chemicals should be kept apart from one another. For more detailed description of the sorting and packing of chemical residues, contact Daniel Sellberg, daniel.sellberg@sekamiljoteknik.se, 070-795 00 26 or Patrik Karlsson at SEKA Miljöteknik AB, patrik.karlsson@sekamiljoteknik.se, 070-795 00 27.

Small chemicals can be deposited in their original containers if the packaging and seal are intact and the contents clearly stated on the label. Every container should be marked with a waste label, on which certain information must be entered, see the *Marking/labeling*. It is very important that substances that can react with one another are kept separate, for example acids and alkalis, cyanide and acids, sodium azide and heavy

metals. Cellulose nitrate and picric acid must be moistened to at least 30 per cent when deposited and aqua regia must be neutralized. Holders of large quantities of small chemicals to be sent for destruction are recommended to contact SEKA Miljötekniks' staff before disposal. They can pack the chemicals on site and then remove them. Small quantities of small chemicals can be placed in a cardboard box, for example. Bottles must be marked with waste labels. It is important to separate substances that can react with one another!

Solvents (organic, water-based, pure or mixtures). Empty, cleaned glass bottles can be used for the collection of solvents. Solvents must not be kept in long-term storage in plastic drums since the plastic can be affected by the contents.

Solvents must maintain a **pH value of between 4 and 10**. Different types of solutions, such as halogenated and non-halogenated, must be collected separately since the destruction costs are different for different types.

Solvent residues must either be deposited in type-approved plastic drums intended for transport (max 5 years old) or the glass bottles of solvents and then must be packed in cardboard boxes for hazardous waste with an inner plastic bag. Plastic drums containing solvents must not be packed together in large waste containers. The SU Shop sells approved plastic drums for transportation.

Perchloric acid over 72% may not be deposited; it must first be diluted to lower concentrations!

Substances that can form peroxides (e.g. ethers, THF, dioxane, isopropyl ether) should normally be peroxide-tested before being deposited, and be marked "Peroxide test OK" on the label, including the date of the test.

However, if you encounter solutions suspected to contain high levels of peroxides, do not touch the bottle, block the lab and contact Daniel Sellberg, daniel.sellberg@sekamiljoteknik.se, 070-795 00 26 or Patrik Karlsson patrik.karlsson@sekamiljoteknik.se, 070-795 00 27 at SEKA Miljöteknik AB, and the Section for Safety and Security, 08-16 4200.

Note: Always contact SEKA Miljötekniks' staff if you are not sure what to do!

Marking/labelling

Use Stockholm University waste label filled in with following information:

- Storage, room temperature
- Type of waste, specification: "Chemicals" and specification.
State the contents in %, and the proportion of water. Heavy metals must be given in a mass percentage; the pH value of solutions must be given.

- Solvent residues – note that all components of the contents must be stated on the label. Markings such as 'slop' or 'waste' must not be used!
- Substances that can form peroxides such as ethers must be peroxide tested before being deposited, and be marked "Peroxide test OK" on the label
- A or B substances are marked "A substance" or "B substance" and, for example, carcinogen
- Submitting department, section and department number, MMK lab number (on the reference field)
- Submitter's name and phone number and date

Hand-over

Waste can be deposited on Wednesdays or Fridays at 10.30–11.00 in room M212 at KÖL (Chemical Education Laboratories), Svante Arrhenius väg 16F. Substances on the A or B list (AFS 2014:43) must be marked A or B substance and be deposited when a chemist attends. Contact **Daniel Sellberg**, daniel.sellberg@sekamiljoteknik.se, 070-795 00 26 or **Patrik Karlsson**, patrik.karlsson@sekamiljoteknik.se, 070-795 00 27.

2.2 Laboratory glass

Classification/separation

Laboratory activities generate different types of glass that go to recycling, incineration or disposal. Laboratory glass includes, for example, bottles, cans, bowls and glass tubes. Laboratory glass that has been used as containers consists of soda lime glass, while other laboratory glass usually consists of borosilicate glass, silica glass or special-purpose glass.

Laboratory glass is divided into the following groups:

- 1. Contaminated** laboratory glass (whole or broken)
- 2. Non-contaminated** laboratory glass **not defined as a recyclable** container (beakers, petri dishes etc.)
- 3. Non-contaminated** laboratory glass **defined as a recyclable** container (bottles and cans)

Handling/storage

- 1.** Contaminated laboratory glass that for example, may contain chemical residues, microorganisms or radioactive substances must be **handled based on the contamination**. This waste must be packed in approved containers i.e. containers for hazardous waste, (SU shop-article number 6344-038, 6343-038 (glass)), or containers for infectious waste and/or sharps, (SU shop-article number 6342-030/050), and marked with waste labels.
- 2.** Non-contaminated laboratory glass that has **not** been used as a container should be placed in the laboratory glass-recycling container (not a waste fraction currently).
- 3.** Non-contaminated laboratory glass that has been **used as a container** - empty, well cleaned and evaporated – can be placed in the recycling

containers for colored or clear glass at the waste management center, A2, outside the SU Shop.

Marking/labelling

Recycling of containers for non-contaminated laboratory glass not used as containers must be marked "Laboratory glass". Contaminated laboratory glass must be marked based on the contamination in question.

Hand-over

Contaminated laboratory glass and non-contaminated laboratory glass not used as a container can be disposed on Wednesdays and Fridays at 10.30–11.00 in room M212 (KÖL), Svante Arrhenius väg 16F.

Non-contaminated laboratory glass that has been used as container (see above) is placed at the waste management center at A3, Arrhenius Laboratory, outside the SU Shop.

2.3 Sharps

Classification/separation

Sharps waste includes discarded injection needles, knife blades, Pasteur pipettes, pipette bags, etc. Sharps that can be contaminated with chemical residues, microorganisms or radioactivity must be handled based on the contamination concerned, for more information see the sections about each type of waste and/or SU's home page.

Handling/storage

Sharps are collected in puncture-safe jars, which are then packed in the yellow waste containers. Contaminated sharps are stored based on the contamination concerned, for more information see the sections about each type of waste.

Marking/labelling

Use Stockholm University waste label filled in with the required information.

Hand-over/transport

Hand-over based on the contamination concerned, for more information see the sections about each type of waste. If refrigerator/freezer storage is not required, the waste can be disposed on Wednesdays or Fridays at 10.30-11.00 in room M212, (KÖL), Svante Arrhenius väg 16F.

2.4 Human By-products (blood, tissues etc.)

See Instructions on SU's home page.

2.5 Radioactive waste

See Instructions on SU's home page.

For more information, see: <http://www.su.se/sustainablecampus/how-to-do/waste-management/laboratory-waste>

12. Appendices to Work Environment and Safety Rules for Laboratory Work at MMK

Appendix 12.1.

Introduction of new co-workers at MMK: - postgraduate (PhD) students, guest researchers and post-docs

Objectives

Create procedures to ensure that new co-workers, graduate students and postdoctoral and visiting guest researchers:

- feel welcome to the department and the research group
- rapidly can start to perform their work tasks
- receive information about: safety and risk assessment in the work at the department, administrative procedures, existing departmental and university master plans, postgraduate studies at the department, research group's role at the department etc.
- gets a planned personal introduction including some long-term aspects.

Preparation before the arrival:

Supervisor or host informs the administration office and system administration staff in time:

- 1:** In good time in advance (at least three weeks before) fill in the necessary information about the new co-worker in department's registration form, under My Department *Register New Guest* on *Control Panel* accessed via login from MMKs website inside firewall. You will need a copy of the passport or ID-card (Swedish citizens) from the new co-worker.
- 2:** Within registration at Control Panel you must inform if the new co-worker will have salary/stipends via SU (choose Employee) or not (choose Guest). Contact Human resource staff for additional information, for ex. About income taxes, see below. Salary will be decided by the head of department after discussion with the host.
- 3:** Ensure, together with the person responsible for the Work environment at the unit, that desk space is assigned before registering into Control Panel and ready for use.
- 4:** Ensure that a place is prepared in the laboratory for experimental work.
- 5:** Contact MMK's IT-specialist if something is needed that is not informed about in the control panel.

Introductions:

The supervisor/host receiving the new arrivals should introduce the person to the administrative, work environment and technical staff and be responsible for taking care of the arrangements on arrival, and to the members of the Research Group and the assistant supervisor. The desk and workplace with computer access are presented and information on regulations is provided. The person should also be introduced to the

Head and Deputy Head of MMK, Chair of Work Environment Group and the Head of the PhD student's council ASAP, preferably the first day. Other relevant people at the department are presented and their function/work/research fields are described briefly. By the next division information meeting, the new person will give a short presentation of him/herself. It is important that safety precautions are discussed, and instrumental and laboratory facilities and safety procedures are shown. The host/supervisor makes the first day up a plan for the remaining part of the introduction according to the attached checklist.

Research team's role

Supervisor/host tells about the research group's activities, introducing partners within the department and the university, and in other places. It is also important to demonstrate instrumental techniques and give instructions for their use, and to present the responsible persons for those facilities.

The department's role

Graduate students: An introduction plan is made with time set aside so that the newly arrived student may meet with the Director of Studies and administration. The Director of Research Studies presents briefly the department's research activities and postgraduate education. The Director of Undergraduate/Graduate Studies informs about educational programs, and if it is relevant, work as assistant in courses. The administrative director tells about the benefits for employed graduate students.

Post docs: The host presents briefly the department activities in research and higher education, preferably in the context of a tour around the department. Administrative staff is contacted for questions regarding the payment of allowances/salaries, expenses, etc.

Guest Researcher: Relevant project leaders of MMK are asked (via e-mail) if they would like a personal meeting with the new arrival and a schedule for these meetings is made. Administrative staff is contacted for questions regarding the payment of allowances/salaries, expenses, etc.

Safety

At an early stage in the introduction a detailed review of safety rules and procedures of the laboratory work and computer use should be made. A separate binder with safety materials will be distributed to new arrivals at the Administration office on arrival. The supervisor introduces the security issues, shows how risk assessments should be performed using the KLARA system, and presents the work environment and safety officers. A tour of the laboratory is made together with the supervisor and preferably with a safety officer, to demonstrate safety procedures and equipment where required. After reading the material and plans in the binder and after a

passed Quiz about the contents, the new arrival signs a document that is returned to the Administration office to acknowledge that he/she has read and understood the safety information.

Administrative procedures

The Human Resources Administrator is contacted for questions about employment/reimbursement issues. Furthermore, the Administration office provides information on how the purchases in SU-shop (SU-butiken) are made and handled, reimbursement for travel and personal expenses, etc. For graduate students, general information on benefits, sick leave, vacation, travel reports and allowances, etc. are described on the MMK website.

Directives at the Department and Stockholm University

The following plans prepared at MMK are found on the MMK's web page: The Work environment and Equal Treatment plan, Fire protection plan, Environmental plan, Environmental Policy, Management and Equality and Emergency Plans for Stockholm University can be found on SU web page:

Environmental Policy:

<http://www.su.se/sustainablecampus/management/environmental-policy/environmental-policy-1.204671>

<http://www.su.se/english/staff/personnel/environmental-policy/procedures-and-instructions>

Management Plans:

<http://www.su.se/sustainablecampus/management/documents>

Equality Plan: <http://www.su.se/english/staff/personnel/working-environment-health/sexual-harassment>

Emergency plan: <http://www.su.se/english/staff/services/emergency-crisis/emergency-crisis-1.2407>

Information about the details of postgraduate training

In connection with making an individual study plan the supervisor should make a detailed first review of the project with the student, the required and elective courses in the graduate program, possible work as assistant or other department service, etc. In addition, information should be given of how the progress in the graduate program is followed up, annual up-grades of the individual study plan, by seminars, licentiate or half-time presentation, and thesis defence.

To facilitate the organization of the information, a checklist is prepared, in which boxes can be ticked both by the new arrival as well as the one providing the information, see the Checklist below.


CHECKLIST (New co-workers, PhD-students, Post-docs, Researchers)

PhD-students will be invited to an information meeting with Director of PhD studies, HR, safety officer etc. These meetings are normally held 1-2 times per semester.

Preparations for all new co-workers:	Check (or sign) when done	
Three weeks before arrival:	Responsible	New arrival
In good time in advance (at least 3 weeks before) fill in the necessary information about the new co-worker in department's registration form, under My Department <i>Register New Guest</i> on <i>Control Panel</i> accessed via login from MMKs website inside firewall www.mmk.su.se Within registration at Control Panel you must inform if the new co-worker will have salary/stipends via SU (choose Employee) or not (choose Guest). Contact Human resource staff for additional information, for ex. about income taxes. Salary will be decided by the head of department after discussion with the host.	Supervisor / host	
Ensure, (before registration in Control panel) together with the person responsible for the Work environment at the unit, that desk space is assigned and prepared.	Supervisor / host	
Few days before arrival:	Responsible	
Assign fadder (buddy)	Supervisor / host	
Check that the workplace is prepared and ready	Supervisor / host	
Prepare work tasks for the first working days	Supervisor / host	
On arrival:		Fadder/ New arrival Sign
Receive the new co-worker, show desk place and introduce to the co-workers in the room, then for administration staff.	Supervisor / host /fadder	
Distribute internal information material ("Work Environment and Safety Rules for Laboratory Work at MMK") with safety rules and access card. Routines for security/access system.	Supervisor / host /fadder	
Introduce to prefect, deputy prefect, and director of studies, safety representatives, and laboratory safety coordinator. Show the department's common areas, (seminar room, lunch room, rest room, dressing room, waste room, work shop) and provide information on procedures and rules for coffee breaks and lunch break (coffee /tea, washing procedures, refill, kitchen duties etc.). Inform about how to create a personal site at MMKs website.	Supervisor / host /fadder	
Administrative routines:	Responsible	Fadder/ New arrival Sign
Distribute envelope with SU-account information, computer rules.	System admin	
Inform about "You and your work place", flex time for employees, health and University staff organisations for employees.	Staff admin	

<p>During the first week up to 4 weeks:</p>		
<p>Personal administrative routines:</p> <ul style="list-style-type: none"> • Holiday and other absence • Report illness • Primula • Report of bisyssla • Health care • Salary payment • Insurances, even unemployment (a-kassa) • Working hours, Well-being 	<p>Staff admin</p>	
<p>Information about:</p> <ul style="list-style-type: none"> • Information boards • Intranet • Printers (inclusive colour- and poster printer), scanner, copying and fax • Storage (office ware) • Post, package • Ordering- and invoice routines • Staff meetings (MMK-info) • Waste handling, recycling • SUs website • SUs course for new employees • SUs rulebook http://www.su.se/regelboken/ • SUs environmental policy and MMKs environmental action plan • Library and electronic access to journals and e-books • Access to e-mail and other electronic resources from home • Systematic work environment, presentation of safety representatives 	<p>Supervisor / host /fadder</p>	
<p>Security information, departmental- and university's action plans:</p>		<p>New co-worker Sign</p>
<p>Security information:</p> <ul style="list-style-type: none"> • Important phone numbers (list on information boards) • Emergency exits, emergency plans, assembly place • Fire extinguishers, smoke detectors • Water hoses • Fire blankets • Emergency showers, eye showers • First aid, Band-Aid • Hart starter • Information on intranet • Sign-up to Work environment and laboratory safety education, Risk assessment, general Fire safety education • Safety data sheet, KLARA, Bretherick's Handbook of Reactive Chemical Hazards (e-book in the library SUB) • Incident notification to SAMIR, serious incidents WITHIN 24 h to head of department or safety responsible • Information about pregnancy and nursing 	<p>Supervisor / host / Fadder Arbetsmiljöombud/Brandskyddskontrollant</p>	



 <p>Information about:</p> <ul style="list-style-type: none"> • SUs organisation • MMKs organisation • Ev. KLARA system, labdata system LIMS • Before Leaving MMK document 	Supervisor / host / fadder	
Introduce relevant action plans; MMK's Work environment and Equal treatment plan, Fire safety plan, Plan of Action against Harassments, Environmental action plan och Crisis plan	Supervisor / host / fadder	
Guide to SU's website for comprehensive plans.	Supervisor / host / fadder	
Review of safety equipment in laboratories, laboratory safety, Work Environment and Laboratory Safety course (compulsory), procedures for risk assessments by means of the KLARA system, inform about the SU-shop, and provide lab coat and safety glasses.	Supervisor / host	
Acknowledgement of the safety procedures for laboratory work by signing document (QUIZ 10 and 11) and Code of conduct. The documents are archived in the Laboratory safety coordinators office/Administration office.	Supervisor / host	
Notification next of kin. The document is archived in the Administration office.	Supervisor / host	
PhD-information and individual PhD-study plans:	Responsible	PhD-student
Give a short introduction to MMK's general activities including the presentation of the MMK's website, inform about the computer rules and PhD Handbook.	Supervisor / host	
Inform about the importance of being insured.	Supervisor with cosupervisor	
Prepare and review of the individual research education plan to be signed by the student, supervisor and head of the department	Supervisor with cosupervisor	
Inform about the procedures on graduate education from the start to the defence of thesis.	Supervisor with Director of PhD-studies	
Describe MMKs and ONs PhD-courses and routines for PhD education from start to final thesis, including update of study plans, registration of courses, prolonging's connected to possible special assignments or illness, assistant teaching and departmental work. Introduce MMK's teaching activities in undergraduate and postgraduate courses, especially aspects of assistant (laboratory) teaching by research students.	Director of PhD-studies	
Discuss the use and support needed for the use of computer programs and databases at the department. Establish a plan for knowledge transfer.	Supervisor with cosupervisor	
Describe MMKs teaching on the bachelor and master levels.	Relevant director of studies	
Present the research group and the research group's activities. Invite the newly arrived person to lunch on the first workday for informal communication.	Supervisor / host / fadder	
Show relevant instruments and give instructions for their use. Introduce the instrument responsible persons to the new co-worker.	Supervisor / host / fadder	

	Check (or sign) when done	
Routines for you who leave MMK:	Responsible	Leaving person
Contact your system administrator to cancel your SU-account; archive data etc.	System admin	
Empty and clean your work place in the office. No samples should be left in your drawer.	Guest/student/leaving person	
Empty and clean your lab bench in all the labs you have worked in. Archive your lab journal. Take care of your synthesis samples and special chemicals which you have worked with during your time at MMK, according to the rules of hazardous waste disposal. Inform your supervisor about the eventually leftover chemicals from your research project. No samples should be left without proper handover.	Guest/student/leaving person	

Fadder is responsible that the new co-worker meets all the persons mentioned on the list. Introduction list should be returned with signatures within 5 weeks to administrator or Laboratory safety coordinator.

Introduction finished date:

Employee's signature:

Fadder's signature:

Administrator's/Laboratory safety coordinator's signature:

.....

Appendix 12.2.

Handling procedure for work with Hydrofluoric acid

Work with HF:

HF is very toxic by inhalation, skin contact or when ingested, further the compound is strongly corrosive. Note that HF on the skin can, even a very small amount, gives serious injuries if it is not neutralised with antidote (2.5 % calcium gluconate).

Storage

When HF is not used, it should be stored in a closed bottle in a ventilated cupboard.

Work

All work with HF should be conducted in a fume hood. Lab coat, protective glasses and gloves should always be used. In connection to the workspace, there should be a 2.5 % calcium gluconate gel to be used in case the skin is exposed to HF. There should also be calcium tablets to swallow if you accidentally ingest HF and a bottle with a calcium solution (e.g., Ca(OH)_2 /lime solution) for destruction of HF. After use, all containers with HF should be removed from the fume hood. There must not be any HF left. HF can only be stored in chemical cupboards for that specific purpose.

Waste and spill

Large amounts of HF can be neutralised with lime (Ca(OH)_2) solution, forming $\text{CaF}_2(\text{s})$. The mixture can then be flushed down the drain. Smaller amounts and spill can be rinsed off with large amounts of water.

In the event of HF exposure

Remove contaminated clothing. Immediately, rinse with water for 10 – 15 min. Wipe the skin and rub with ample amounts of 2.5 % calcium gluconate (antidote). When the exposure is minor, contact the health information service, if it is not minor, go directly to hospital.

If HF has been ingested, eat 10-15 calcium tablets dissolved in water, if possible.

Appendix 12.3.

Special regulations for some groups of hazardous chemicals

Chemicals should always be stored in a safe manner.

Always conduct a risk assessment **before** doing the actual experiment and consider the risks an experiment can imply, and plan for counter-measures!

Always keep appropriate antidotes at hand to neutralize toxins or corrosive compounds (see safety data sheets and other information on chemicals in the KLARA-system. (Log in with SUKAT credentials).

Toxic, carcinogenic, mutagenic and reprotoxic chemicals shall be stored in locked cupboards.

In the Swedish Work Environment Authority's Statutes, AFS 2014:43 provisions on chemical hazards in the working environment and special requirements for work with chemical compounds are given.

12.3.1. Substances, which are prohibited or require a permit (A- and B-substances), see KLARA

<http://www.su.se/english/staff/it/it-support-systems/klara>

Group A – Substances which may not be handled

The stipulations also apply to the substance's salts and when the substance contains water of crystallization (i.e. crystal water).

Group B – Substances, which may only be handled with special permit

The stipulations also apply to the substance's salts and when the substance contains water of crystallization (i.e. crystal water).

12.3.2 CMR – Carcinogenic, mutagenic and reprotoxic products

Special requirements for handling of carcinogenic (C), mutagenic (M) and reproduction-toxic (R) products, which meet the criteria for classification with following hazard statements or risk phrases:

1. **H350:** May cause cancer
2. **H340:** May cause genetic defects
3. **H360:** May cause harm to fertility or to the unborn child
4. **R45:** May cause cancer
5. **R46:** May cause heritable genetic damage

- 6. **R49:** May cause cancer by inhalation
- 7. **R60:** May impair fertility
- 8. **R61:** May cause harm to the unborn child

These chemicals/products can only be handled if there is

- 1) a documented investigation indicating that it is not technically possible to replace the product by using other product/chemical which presents a lower risk of ill-health and accidents and when
- 2) a risk assessment for handling such chemicals are documented as described in AFS 2014:43.

12.3.3 M-marked chemicals – medical supervision can be required when handling these compounds

The text in AFS2015:3 (2005:6) describe the medical controls that can be required when handling certain chemicals, such as lead- and cadmium compounds.

- The medical examination should include for example physical health status, control of blood pressure together with determination of concentration of lead or cadmium in blood or in urine.

Appendix 12.4.

Waste management and routines for disposal

12.4.1 Waste and waste handling

Stockholm University has a number of waste management centres for source-separated waste. The waste that is handled at Stockholm University can be household waste, industrial waste or hazardous waste.

In **Waste management procedures for Stockholm University** routines for handling and labelling waste from office activities and laboratory activities is described.

<http://www.su.se/sustainablecampus/how-to-do/chemical-management>

Office activities

Batteries*
products
Electrical/electronic products*
Glass containers (coloured and clear)
Refrigerators and freezers*
microorganisms
Food waste and compostable waste
Light sources*
Metals
Furniture
Plastic
Paper for recycling
Separable waste
Stretch and shrink-wrap
Toner cassettes and ink cartridges
Wood
Corrugated cardboard and paper packaging/containers

***Hazardous waste**

Laboratory activities

Animal products and by-
Antibiotics
Biological agents
Genetically modified
Genetically modified organisms
Human by-products
Chemicals
Laboratory glass
Narcotics/chemicals
Radioactive waste
Sharps

In *Laboratory safety directives*, instructions for handling of chemicals, laboratory glass and sharp **waste** are described.

12.4.2 Routines for chemicals into sinks

The general rule is that **no hazardous waste may be deposited in sinks**, except according to the instructions given in "*Rutiner för utsläpp av flytande kemikalierester i avlopp*" i.e. *Procedures for the Disposal for liquid Chemical residues and aqueous solutions*.

<http://www.su.se/sustainablecampus/how-to-do/waste-management/laboratory-waste>

This document should be available at every laboratory!

Appendix 12.5.

Regulations for work with condensed gases and handling of liquid N₂

1. Work with condensed gas (specifically cryogen media; **liquid nitrogen, liquid helium**) should be planned and conducted so that direct contact with the gas is avoided. If risk of splashes or other contact cannot be avoided, personal safety equipment (facial protection or protective glasses, gloves and lab coat) must be used. Contact with metal objects, which in turn are in contact with the cryogenic media, also poses a risk for frostbite.
2. It is important that a container containing cryogenic gases is protected from accidentally being tipped over. Transfer of liquid nitrogen to receptacles that are placed high, as for example can be the case with electron microscopes and this should be done with great care. Containers should be equipped with valves that can be used in case of a build-up of pressure.
3. Please note that the oxygen in the air (boiling point 90 K) can condense on un-insulated containers with liquid nitrogen (77 K) or helium (4 K) or inside the containers. This can be a potential fire hazard. Take specific care to ensure that no foreign gases can come into contact with liquid helium!
4. Work with liquid oxygen should be done with greatest care because of the fire and explosion hazard associated with contact with reducing compounds.
5. Please note that condensation of large amounts of nitrogen/helium indoors affects the oxygen concentration and thereby the need for proper ventilation. In particularly exposed premises, equipment that measures the oxygen concentration should be installed.
6. Staff working with condensed gases must be educated by their supervisor or some other qualified person. This must be documented!
7. When refilling NMR-magnets with liquid nitrogen/helium, make sure that no iron objects come into contact with the magnet. Great risk for personal injuries as well as damage to the equipment!

More information on work with gases can be found in the Work Environment authority's regulations, AFS 1997:7

<https://www.av.se/arbetsmiljoarbete-och-inspektioner/publikationer/foreskrifter/gaser-afs-1997-foreskrifter/> .

Rules for handling liquid nitrogen

Liquid nitrogen handling involves risks of accidents and ill health. In order to limit the risk of injury at the workplace you must do a risk assessment and have written handling and protection instructions that are adapted to the workplace (lab) in question in place.

Law

The law steering liquid nitrogen handling is found in AFS 1997:7 "Gases" and AFS 2011:19 "Chemical working environment risks".

Handling

Handling refers to storage, transport, use, disposal, manufacture, processing, packaging, destruction, conversion and similar procedure (AFS 2000:4). Handling involves work in the laboratory as well as in field conditions (for example sampling outdoors at remote premises requiring transport of liquid nitrogen by helicopter, etc.).

General

Liquid nitrogen work must only be carried out by those who have sufficient knowledge of the risks that can arise from handling and use, and how they can be avoided. The nearest manager shall ensure that the employees handling liquid nitrogen have knowledge of the risks and have been informed of the local handling and protection instructions. Equipment/containers used in liquid nitrogen handling shall be designed in accordance with AFS 1997:7 with regard to material selection and safety devices.

Common risks when handling liquid nitrogen

Liquid nitrogen is a colourless, odourless and tasteless liquid. The gas is not toxic and does not burn. The boiling point is -196 °C at atmospheric pressure. When handling liquid nitrogen, the low temperature means a risk of cold damage. Unprotected moist skin can momentarily freeze to metal objects cooled by nitrogen, which can cause severe wounds to occur upon release. Also note that many types of materials (such as plastic) do not withstand the low temperature of the liquid, which can pose great risks to the user.

At +20 °C the liquid nitrogen gas takes about 700 times as much space as the liquid. This means that in the gas conversion of liquid nitrogen there is a risk of displacement of the oxygen in the air, which can cause oxygen deficiency to occur. This is especially evident in confined spaces such as smaller rooms and elevators (see further under Internal transport), but also in larger spaces where liquid nitrogen is stored or used. This also means that very small quantities of liquid nitrogen can cause high pressure in sealed vessels. For this reason, larger containers (such as transport containers) without a safety valve may under no circumstances be completely sealed, and so-called dummy filling should be voided (i.e. closed vessels must not be top-filled and must have an expansion volume in addition to the safety valve). If a container cannot be opened and the gas is not able to come out of the container, assistance via SOS Alarm should be called immediately (112).

Risk assessment

The nearest manager (or delegated person with sufficient knowledge) must always make a risk assessment before work on liquid nitrogen begins. It is important that the risk assessment is clearly limited to the tasks performed in the specific operations. This will form the basis of the local written handling and protection instructions which, in addition to the actual handling, must also contain instructions on protective equipment, first aid and remediation. In particular, take into account the risks of cold damage (e.g. unprotected skin against metal objects) and the risk of oxygen deficiency. When considering the risk of oxygen deficiency, the size of the room must be taken into consideration. Example: In a lift that is 2x2x2 m, i.e. 8 m³, it is dangerously low (i.e. <18%).

Protective gear

When transporting, filling and handling liquid nitrogen, visor or goggles should always be used, as well as special gloves for cryo work. Shoes and clothing should be tailored to prevent direct contact of liquid nitrogen on the skin. When choosing shoes, the liquid nitrogen should not be able to accumulate around the foot (avoid, for example, bowl-shaped sandals, or boots where the pant legs are stuffed into the boot shaft).

First aid

High levels of nitrogen can cause asphyxiation, which can occur without warning. The symptoms may also include unconsciousness. In case of respiratory distress, the injured person must be moved immediately at a safe distance from the source of nitrogen. The injured person should be kept warm and still. Call a doctor. Provide breathing assistance of breathing stops.

NOTE: Take into account that you yourself are at risk of suffocation in the space where the injured person has been found. Make sure the space is properly ventilated as quickly as possible.

In case of splashes in eyes, rinse immediately with plenty of water for at least 15 minutes. Doctor should always be contacted.

Frozen body part is thawed with lukewarm water until skin regains feeling and normal colour. Do not rub or process damaged body part. This can aggravate the damage. We should always seek medical attention for deeper or more extensive cold injuries. Thawing must not be interrupted during transport to hospital.

Internal transport

Transport should be carried out so that the risk of spillage is minimized. Transport of smaller quantities (1-10 litres) is carried out by employees carrying the vessel directly to the room where the vessel is to be located. Transport of larger quantities (>10 litres) is carried out by trolley or special trolley, or by carrying larger cryo vessels by two persons (the cryo vessels must be equipped with therefore suitable handles). The transport must take place in such a way the vessel cannot overturn. In the case of lift transport, no persons may be in the lift during transport. The elevator must be signposted so that no one accidentally enters the elevator.

Decontamination

In the case of small spills, leave the premises and assess whether further measures need to be taken. The measures to be taken depend on space, operation and air exchange. In case of large emissions, the area should be shut off. Remediation is done by ventilating. Avoid discharge to the sewer if possible.

Waste

liquid nitrogen must not be poured into a sink. Smaller vessels are placed in fume hoods where the nitrogen can safely evaporate away.

Signs

Warning sign marked "Liquid nitrogen" shall be displayed in the premises where liquid nitrogen is stored/handled.

Alarm and security routines

For larger plants or where the risk of suffocation is higher, the risk assessment shall investigate whether alarms indicating low oxygen content must be installed.

To think of:

- Do risk assessment and write handling instructions, which must be in connection with the task
- Ensure good ventilation
- Never work alone in the room
- Consider keeping the door open (to avoid suffocation risk)
- Install alarms indicating low oxygen content if necessary
- Wear protective gloves, proper shoes, protective clothing
- Review routines during transport
- The supplier's safety data sheet must be available at premises near connection to the task
- The signage should be set up and visible
- When helping an individual affected by oxygen deficiency, take into account the risk that you may be suffering from oxygen deficiency in the space in question

Information

Specific questions on liquid nitrogen handling can be answered by laboratory safety coordinators at Stockholm University: Mikael Corell at the Security and Safety department (FA), information at www.su.se.

Safety officer/representative

For further support regarding risk assessment and handling, contact your local safety representative, or laboratory safety coordinator. Find current information on MMK's intranet (My Department/).

Appendix 12.6.

Procedure for work with pressurized devices

Pressurized containers are classified for inspection into the classes A, B and C. Documentation, including a risk assessment, must be available for pressurized containers in the lowest class, C, which concerns smaller pressurized containers where the pressure [bar] x volume [L] is below 50. Further, for classes B and C, an installation inspection is required and recurring inspections by an accredited authority. The pressurized container should have a safety valve in case the normal working pressure is exceeded.

Gas cylinders pose a great potential risk, partly because hazardous gas can be released in the event of a leakage causing a fire, poisoning, oxygen deficiency etc., and partly because they can explode.

- Only the gas cylinders necessary for the work may be present in the lab. Warning signs should be posted in connection to the work area.
- Gas storage rooms have a list of gases on the door board (in the form of magnetic stickers), which shows all the gas tubes inside. If you remove a tube, you must take its magnetic sticker label with it and put it on the magnetic door board outside your lab.
- The cylinders must be secured (anchored) against falling or being knocked down.
- They should be placed no closer than 1.5 m from electrical outlets. Valves and tubing should be constructed and dimensioned so that an adequate safety can be obtained.
- Valves must be free from dirt, oil and corrosion.
- Transport of gas cylinders should be conducted using carts designed for this purpose and with the cylinders safely secured.

Appendix 12.7.

Procedure for work with X-ray equipment (diffractometers)

- Radiation protection training and authorization must precede work with X-ray equipment.
- The radiation from the equipment must be checked regularly with a radiation meter. Radiation meters must be available in connection to the equipment.
- Automatic safety devices, such as shutters and protective hoods with locks must be checked regularly. The safety devices can never be disabled without special precautions.
- Prior to every experiment, verify that the signal-lamp indicating X-ray emission is functioning.

Appendix 12.8.

Assurance of compliance

I have read, understood, and I agree to abide by the contents of the documents listed below (cross over the non-relevant parts), concerning security and work environment at the Department of Materials and Environmental Chemistry, Stockholm University.

1. This is how we want MMK to be - Code of conduct
2. Emergency numbers (*Section for Safety and Security*)
3. General Safety Regulations (and alarms systems at MMK)
4. Fire Protection Plan
5. Crisis plan for MMK
6. Environment - Action plan (*in Swedish*)
7. Work Environment and Equal Treatment – Organization and Action plan (*in Swedish*)
8. Rules for computer usage at MMK
9. Notifications of incident or injury at work etc. (SAMIR)
10. Personal safety equipment (*read before laboratory work*)
11. Laboratory safety directives (*read before laboratory work*)
12. Appendices
 1. Welcome procedures for newcomers
 2. Work with HF
 3. Work with other special health hazardous compounds
 4. Waste management and routines for disposal
 5. Work with condensed gases and handling of liquid N₂
 6. Work with pressurized devices
 7. Work with x-ray equipment
 8. Assurance of compliance
 9. Contact information template
 10. Compulsory QUIZ: QUIZ 1 (for everybody)
 11. Compulsory QUIZ: QUIZ 2 (for laboratory access)
 12. Assurance "Leaving MMK"

☐

I have been shown laboratories and their safety equipment (tick box).

.....
Place and date

.....
Signature

.....
Clarification

Institutionen för material- och miljökemi

Appendix 12.9.

Contact information (in case something happens)

Name: Date:

Address:

Phone number:

Personal id number (date of birth):

Name of contact 1	
Relation (not obligatory)	
Phone number (mobile)	
Phone number (work)	
Phone number (home)	
E-mail address	
Name of contact 2	
Relation (not obligatory)	
Phone number (mobile)	
Phone number (work)	
Phone number (home)	
E-mail address	

Do you have your own insurance (travel, health, accident) that is valid during your stay at MMK?
If so, which company?

.....

Do you have general Swedish health insurance?

.....

Additional information?

.....

.....

Appendix 12.10.

COMPULSORY (fill in and return to Administration/Janitor, with supervisor's signature)

General safety regulations at MMK (answered by all newcomers)

Name:

1. A siren sounds when you are in the lab or in the corridor. What does it mean and what action do you take?

.....
.....

2. What are the three key words in the event of a fire?

.....

3. What is the emergency telephone number to the police, ambulance and fire brigade?

.....

4. How can you access Internet with your personal laptop computer at the department?

.....
.....
.....

5. You receive an e-mail message the storage limit of your university account is exceeded and must be enlarged, with a request to send/type your login information. What will you do?

.....
.....

6. You receive a cardboard box and you unpack it. Where do you dispose the cardboard and the fillings?

.....

Acknowledged:

Date:

.....

Supervisor/Host: Signature

Clarification (please text)

Appendix 12.11

COMPULSORY (fill in and return to Administration/Janitor, with supervisor's signature)

Laboratory safety directives at MMK (answered by all with laboratory access)

Name:

1. What personal safety equipment must be worn during laboratory work or handling of chemicals?

.....

2. Who decides if you must write a risk assessment for your laboratory work/experiment and who can sign it?

.....

.....

3. How can you find MSDS for chemicals and how can you perform a risk assessment?

.....

4. List at least four items in the laboratory, which are to be used for your personal safety.

.....

.....

5. How can you check if a chemical you are looking for is present in some store at MMK?

.....

6. Where can you find the emergency shut-off of water and special gases to the laboratory in case there is a leak?

.....

.....

7. What are the risks when handling very fine powders? Is there some equipment at MMK for this purpose?

.....

.....

8. What action do you take if there is a fire in another person's clothing in the laboratory?

.....

.....

9. Work injuries and incidents must be reported in writing. How and to whom?

.....

.....

10. You get left-over chemicals from your experiment, classified as "farligt avfall" (i.e. hazardous waste). What do you do for disposal and where can you deposit your waste?

.....

.....

Acknowledged:

Date:

.....

Supervisor/Host: Signature

Name Clarification (in text)

Appendix 12.12.

Assurance

I have read, understood, and I have followed the contents of the documents listed below (cross over the non-relevant parts), concerning security and work environment at the Department of Materials and Environmental Chemistry, Stockholm University.

1. This is how we want MMK to be- Code of conduct
2. Emergency numbers (*Section for Safety and Security*)
3. General Safety Regulations (and alarms systems at MMK)
4. Fire Protection Plan
5. Crisis plan for MMK
6. Environment - Action plan (*in Swedish*)
7. Work environment and Equal Treatment – Organization and Action plan (*in Swedish*)
8. Rules for computer usage at MMK
9. Notifications of incident or injury at work etc. (SAMIR)
10. Personal safety equipment (*read before laboratory work*)
11. Laboratory safety directives (*read before laboratory work*)
12. Appendices
 1. Procedures for newcomers and guests
 2. Work with HF
 3. Work with other special health hazardous compounds
 4. Waste management and routines for disposal
 5. Work with condensed gases and handling of liquid N₂
 6. Work with pressurized devices
 7. Work with x-ray equipment
 8. Assurance of compliance
 9. Contact information template <https://www.su.se/medarbetare/it/it-tj%C3%A4nster/universitetskonto/universitetskonto-sukat-1.124382>
 10. Compulsory QUIZ: QUIZ 1 (for everybody)
 11. Compulsory QUIZ: QUIZ 2 (for laboratory access)
 12. Assurance "Leaving MMK"



I have cleaned my work place in my office and my workbench in the laboratories I have used, archived my Laboratory Notebook and taken care of my syntheses samples in correct way according to hazardous waste management and MMK rules (tick box).

.....
Place and date

.....
Signature

.....
Supervisor/Host/Administration office

.....
Name Clarification

.....
Name Clarification