

Safety instructions for users of the laboratories at The University Centre in Svalbard.

This pamphlet must be read and used by:

1. All the students who will work in the laboratories at UNIS
2. All the employees who will work in the laboratories at UNIS
3. Other people who will work in laboratories at UNIS and need to know this rules.

Bring the pamphlet with you while working in laboratories, and keep it available.

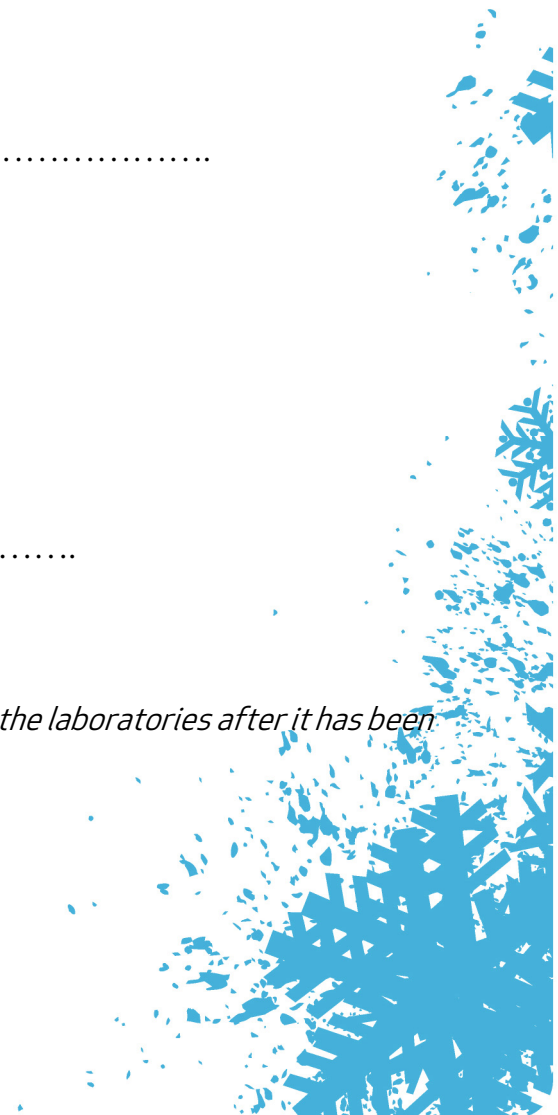
This pamphlet belongs to:.....

I have read this pamphlet:

Date:.....

Signature:.....

This sheet will be copied and kept by the person in charge of the laboratories after it has been signed by the lab user



SAFETY INSTRUCTIONS FOR THE USE OF THE UNIS LABORATORIES

1. Medical aid
2. Fire
3. The laboratory, general safety instructions
The laboratory, special equipped units
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1. Medical aid

Ambulance/medical aid.....telephone number: 113

Longyearbyen Hospital.....telephone number: 79 02 42 00

Please state the following:

1. Your name
2. Where you are calling from
3. The number of injured or ill
4. The nature of the injuries or illnesses
5. If the injury is caused by a chemical, please state what kind of chemical and find detailed information concerning the chemical.

The person in charge of the laboratory has detailed information concerning all chemicals.

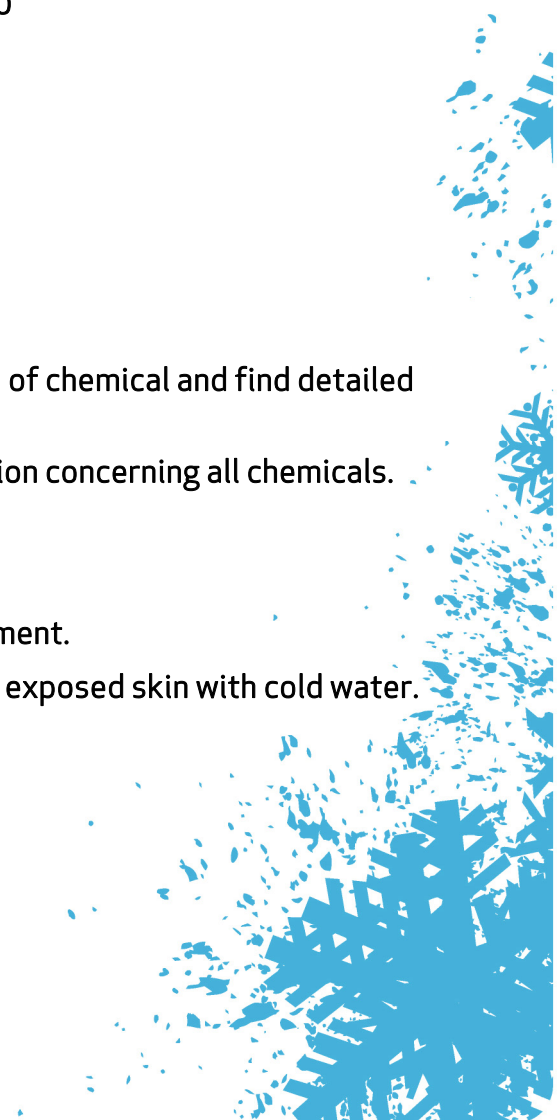
First-aid equipment is placed in every lab.

The lab leader is responsible of supplying the first-aid equipment.

Remember: first aid concerning damage by fire is cooling the exposed skin with cold water.

2. Fire

Telephone number to the Fire Department: 110



If a small fire starts:

- Try to extinguish the fire, but do not take any chances.
- If the extinguishing effort fails, close all connecting doors.
- Trigger the fire alarm and call the Fire Department.

When the fire alarm is sounding:

- Switch off all apparatus, end all experiments and turn off the gas flame.
- Shut all doors, windows and switch off the outlet.
- See if everything is ok in the room next door.
- Evacuate the building through the nearest exit.

There are smoke detectors in all the laboratories and in the connecting corridors. There are fire extinguishers in the teaching-lab, as well as in easily accessible places in the corridors. Directions for use are labeled on each extinguisher.

Carbonic acid extinguisher, CO₂- extinguisher:

Must be used to extinguish fire in inflammable fluids, electrical cords/apparatus.

Carbonic acid must not be used on alkalimetals.

The carbonic acid extinguisher must never be used on humans or animals.

If a lot of gas has been used, one must evacuate the room afterwards because of the danger of poisoning.

The carbonic acid is heavier than oxygen, and will hence be found down by the floor.

Powder extinguisher:

Must be used in offices, cafeteria etc. It is completely harmless for humans.

Fire hose and fire blanket are also found in the teaching-lab.

3. The laboratory, general safety instructions.

In a laboratory there are different elements of risk and several precautions to take. If the safety instructions along with rules and procedures are not followed, the possibility for injuries on both persons and equipment is great.

Order

Good order in the laboratories is important for safety. Instruments, chemicals, apparatus and books which are not being used must be put away. Each individual employee and student is responsible of tidying/cleaning the worktop in the laboratory after use. Wipe up all kinds of mess as soon as possible, you are the only one who knows what has been spilt.

Apparatus

Make sure that the apparatus is in good order before you start working and be sure you know how to use the apparatus in question.

Different directions for use are to be found in the office of the person in charge of the laboratory.

Dangerous substances

Take special precautions when you are working with dangerous substances. In the laboratories you will eye washer for rinsing the eyes. There is also a shower in the teaching and chemical laboratories.

Protective glasses, facial guards, gloves, coats and dust masks are found in the laboratories.

Electronic substance library (*elektronisk stoffkartotek*) you will find at the UNIS web site:

http://www.unis.no/45_LOGISTICS/Laboratories.htm

Never taste any chemicals or solutions!

Label all bottled solutions properly. The label must be legible for all who work in the laboratory and must contain the name of the user, the kind of solution, date and the keeping quality. The user is responsible of throwing away/destroying all solutions that no longer are being used.

Never use your mouth when using a pipette. Use a hand pipette or a pipette balloon.

Glass

Glass instruments with cracks, chips etc. must immediately be thrown in suitable cartons marked *GLASS*. Glass chips must be swept away from floor and benches.

4. The laboratory, special equipped units.

Vacuum/pressure:

If one is working with vacuum or pressure in an apparatus made of glass, one must protect oneself with a facial guard. Excitators and vacuum equipment made of glass will break sooner or later.

Autoclave:

Loosen caps on bottles and make sure it is more than 1/3 amount of free air over the fluid in the container before commencing the work. Do not use containers with cracks. Use protective glasses and gloves. If possible, let large quantities of fluid cool before usage.

Centrifuge:

The rotor must be balanced before start up. Tubes may be damaged in the process and cause splinters. Do not use your fingers to restrain the rotor.

Ultrasound bath:

When using ultrasound bath for cleaning purposes one must use hearing protection. Ultrasound damages the hearing.

Freezer/cold-storage:

Carbon dioxide snow or shipments stuffed with carbon dioxide snow must not be kept in cold-storage chambers or in small rooms without ventilation. The carbon dioxide that is formed may suffocate people staying in the room.

Food must not be stored together with laboratory matter in neither freezer/cold-storage chamber nor refrigerator. Tests/materials that are stored in freezer/cooler must be labeled with name, contents, date and time for keeping. Each individual user is responsible of throwing away tests/materials that no longer are being used.

4. Chemicals.

The person in charge must supervise and inspect the use of chemicals in the laboratories. The users must be aware of the dangers connected to each chemical and follow the safety rules. Poisonous or other harmful chemicals must not be used if other less harmful substances may do just as well.

Storage:

Bottles, flasks, glasses etc. which are used for keeping cultures, chemicals and reagents, must be labeled with content, date, name and warning if needed.

The content of unmarked containers will be thrown away.

Chemicals that are not used on a daily basis must be put in the chemical storage room. Bottles containing substances that have a high vapor pressure in room temperature (ether, alcohol, acetone, xylene, toluene, methanol, nitric acid, hydrochloric acid) must never be completely filled up, and never be exposed to sunlight nor stored in a hot room.

The handling of strong acids and bases:

Never pour water into an acid. When thinning sulphuric acid, the glass must be chilled in cold water. ACID IN WATER-THAT IS POSSIBLE. Watch out for gushes when opening an acid bottle. Always use protective glasses and a facial guard. Be aware of the heat created by the preparation of strong bases. Never pour strong acids or bases into a drain without diluting with water.

GENERAL GUIDELINES FOR HANDLING ACCIDENTS CAUSED BY STRONG ACIDS AND BASES:

Rinse thoroughly and well with water. Equipment for rinsing the eyes are found in the laboratories, rinse the eyes regularly on the way to see a medical practitioner. Bring all information concerning the substance in question with you to the medical practitioner.

Mess on the floor must be neutralized:

Acids: sodium hydrogen carbonate.

Bases: 0.1 N hydrochloric acid.

Then a matter that has a high absorption capacity must be spread on the floor. After a while the mess may be removed with a shovel and then the floor must be cleaned with water. One may have to use a gas mask equipped with the right filter and other additional protective gear. Do not take any unnecessary risks. Contact the person in charge for the laboratories.

The handling of poisonous substances:

Poisonous substances must be handled with the outmost caution. Make sure that all apparatus and other equipment that have been in contact with the poisonous substance are cleaned immediately. Use only the original packing on hazardous chemicals.

The handling of inflammable and explosive chemicals:

Vapors from multi organic solvents are both flammable and poisonous. Avoid using extremely dangerous solvents by substituting them with less dangerous if possible.

Substances that must be avoided: carbon disulphide, benzene, chlorinated hydrocarbons.

Less poisonous solvents: petroleum ether, acetone, ether, xylene.

Working with inflammable substances: **Extinguish open flames, do not use equipment that cause sparks. Use a well-ventilated area.**

Never distill inflammable fluids over open flames. Use a water bath, a steam bath, a hot plate or a heater especially designed for this purpose.

The handling of substances that may cause cancer:

Always stay in a well-ventilated area when working with these substances. Outlet cabinet and benches must be covered with a plastic coated filter paper that must be thrown away after usage.

This kind of work must be performed away from all other activities. Use protective gloves and a coat. If skin gets exposed to these kinds of substances, rinse the skin well under running water and wash thoroughly with soap. Carcinogens must be stored in locked cabinets.

5. Gas

Gas cylinders must only be handled and used by the professional staff. Transport must be done in an especially constructed trolley. Use a thin wooden plate on the floor under the cylinder. The valve must be closed, the reduction valve removed and the safety cap on during transport and storage. The gas cylinders must be restrained, but the chain must be easy to open.

Do not try to transfer gas from one cylinder to another or mix different kinds of gas in one cylinder. As few cylinders as possible must be stored in the laboratory.

You must be familiar with the property of the gas, have the correct reduction valve and know how it is used. Close the valve and the regulator after usage. The reduction valve has a content manometer, which tells the pressure in the cylinder, and an outlet manometer where the amount of gas escaping through the outlet is regulated by an adjustment screw.

When the gas is being used, the pressure, which is measured by the valve, diminishes. However this is not the case of carbondioxide and nitrous oxide which are in fluid form.

Cylinders containing acetylene require special guidelines concerning the check valve and require a powder extinguisher nearby. Acetylene smells like garlic and is solved in a matter of acetone.

During heating or setback the acetylene may undergo an explosive spontaneous rupture. The valves must then be closed, the area evacuated and the Fire Department notified.

Explosive and inflammable gases must be kept on **RED** cylinders. Oxygen must be kept on **BLUE**, air on **BLACK** and nitrogen on **GREEN** cylinders. Always make sure to use the right reduction valve. The different cylinders have different threads however this is not the case of oxygen and carbon dioxide. Make sure the washers are in good condition before switching on the reduction valve. The valve must be completely free from grease on the cylinders containing oxygen. Make sure that hoses and valves are not leaking.

The overhead valve on a cylinder must always be opened in a slow manner. The opening must be pointed away from the person operating the valve.

Never try to open a damaged valve. If the valve seems to be damaged, the cylinder must be returned to the storage facility. Contact the person in charge of the laboratory.

When a cylinder is empty, please mark it with the word "EMPTY". The overhead valve must be closed in order to prevent air from diffusing into the cylinder.

Liquid nitrogen:

May cause serious damage if skin is directly exposed to it.

First Aid: slow heating by using water.

Liquid nitrogen must only be kept and transported in specially designed thermo cylinders. Cold resistant "kryo" gloves must be used.

6. Radioactive materials.

No one is working with or keeping radioactive materials stored at UNIS for the time being. If someone is planning to work with radioactive materials, please contact the person in charge of the laboratory in advance. Then a specific safety instruction for these activities will be developed.

7. Waste.

Glass:

Must be put in separate cartons marked "GLASS". These cartons are found in the laboratories. The glass must not contain traces of chemicals, blood or other contagious or health hazardous substances.

Organic residues from solvents:

Must be poured into separate marked bottles that are kept by the person in charge of the laboratory. The bottles ought to be kept close to a vent or in a well-ventilated room.

Bacteria and fungi:

Agar dishes that contain bacteria/fungi must be put into plastic bags that may be autoclaved. The plastic bags must then be put into black waste bags and thoroughly closed. After the autoclaving the matter may not be considered hazardous waste.

Needles/scalpel edges:

Must be put into separate yellow boxes that are found under the outlet in the laboratory.

Offal:

Must be thoroughly wrapped in plastic. Please; throw away at the same time.

Solid inflammable waste:

Must be put into the container for inflammable waste in the bin store.

Chemicals:

Chemicals must be destroyed/disposed of according to the specific guidelines given in the safety datasheets (kept by the person in charge of the laboratory).

Formalin:

Formalin residue must be poured into separate marked cans. Please contact the person in charge of the laboratory concerning the cans.

Waste that is thrown into the containers must be free of chemicals, contagious matter etc. Empty packing and all equipment made of glass must be cleaned before they are thrown away.

8. Litterature.

Arbeidstilsynets publications:

Arbeidsmiljøloven

Index to the Arbeidsmiljøloven

Regulation concerning systematic health-, environmental- and safety work in operations.

268 How to clean and repair small containers that have contained inflammable fluids.

390 Poisonous and other health hazardous substances.

449 Safety and working conditions in the laboratory.

505 Very poisonous! Concerning marking of health hazardous chemicals.

Publications/books from the Norwegian Pollution Control Authority

Regulations concerning classification, marking etc. of substances that may be dangerous for the environment.

Regulations concerning hazardous waste.

Regulations concerning hazardous substances.

Regulations concerning classification, marking etc. of hazardous chemicals.

Product descriptions and card files of chemical substances.

Aga

Instructions for gas safety.

Gas cylinders in fire.

Safe handling of different gases, oxygen surplus and oxygen deficiency.

The Norwegian Radiation Protection Authority

Regulations concerning the use and handling of open radioactive sources.

