

<b>UNIS CHEMISTRY LAB documentation</b>		Version nr.: 2	Introduced date: 02.12.2014	
Revision nr: 1	Revision date: 28.06.2016	Document type: Safety Instructions		
Made by: Jessica Birkeland		Document code: HSE-LAB-004		
Approved by: Gerd Irene Sigernes		Page 1 of 4		

# Chemistry lab Guidelines and Regulations

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## 1. Introduction to the Chemistry Lab

The purpose of this document is to ensure that all persons follow the same rules and procedures in the UNIS laboratories. You are obliged to work as per the guidelines given below.

The chemistry lab at UNIS is used by many different people staying for varying lengths of time. It is therefore necessary to state the regulations and guidelines for the lab. In this document you will find the routines and regulations concerning the chemistry lab and instrument lab, including handling of chemicals, and safety instructions.

Please read the text carefully and make sure that you understand everything before you begin your work. Do not hesitate to ask if you have any questions or suggestions regarding our routines and safety protocols.

Any questions may be directed to the Lab leader, AT Staff engineer, or resident PhD candidate in Environmental Technology.

## 2. General Information

### Access

You are required to read and sign the Safety Instructions for Laboratory Use at UNIS ([http://www.unis.no/wp-content/uploads/2015/09/Safety-instructions-lab\\_2009.pdf](http://www.unis.no/wp-content/uploads/2015/09/Safety-instructions-lab_2009.pdf)) and meet with the lab leader in order to gain access to the UNIS labs. The chemistry lab is located in room C208, and the Arctic Technology instrument lab is room C206. This document is for you to keep and refer to throughout your lab work. A checklist accompanies your HSE documentation and is used when you begin and end your work in the UNIS labs. This checklist needs to be completed with lab personnel both before and after your lab work begins and ends.

### Manuals

Manuals should always be in a binder in the same room as the equipment is located. Do not remove it. If you need certain information from the manual make a copy. If you are unable to find the manuals, ask. There is often a copy in the Lab leaders' office.

### Material Safety Data Sheets

These are found in the binder located on the bench in the chemistry lab, for all chemicals that are found in this lab. There is also a binder of MSDS for all standards found in the instrument lab. It is very important that you read these before you begin working with any chemical. Make sure to read what protective equipment you should be using when handling the substance, and how to clean up any spills. You should know how to clean up a spill before it happens. Refer to the MSDS to make sure you are using the appropriate personal protective equipment for the substance you are working with.

### Refrigerators and freezers

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There is a small common fridge and freezer in the chemistry lab. These are for small items and short-term storage only. There is a fridge and freezer in the instrument lab that is used only for standards. The walk-in fridge and freezer off the multipurpose room in logistics is used for all other storage.

Anything being stored in the fridges and freezers need to be labeled with your name and contact information, a UNIS contact if you are not permanently at UNIS, date to be stored until, and what the contents are. It is good practise to every now and then go through your things and throw away that which is not necessary to save for the future. Always go through the fridge and freezer when you are leaving UNIS so to not leave anything behind that you may need, or for others to clean up. If you do not label your samples adequately they may be thrown away without notice.

### Phone numbers

Chemistry Lab	room C208	7902 6438
Instrument Lab	room C206	7902 6436
Lab leader, Gerd Irene Sigernes	room C141	7902 3364
AT Staff engineer	room A235	7902 3315

### Common equipment and supplies

In the laboratory storage room C220, in the teaching lab C203, and in the cabinet in the hallway you will find common lab equipment for everyone to use, such as gloves, glassware, tubing, small instruments, etc. Be sure to always return things clean and in working condition. Other small table top instruments are found in a storage room on the ground floor. Ask the AT staff engineer or the Lab leader if you're looking for any equipment.

## 3. Laboratory Safety

### General safety

Eating and drinking is forbidden in all of the labs at UNIS; no food, drinks, water bottles or coffee cups should be brought in any of the labs. No outdoor clothing, shoes or backpacks can be brought into the chemistry lab; they can contaminate samples. It is important that indoor shoes be worn in the labs; you should not be working in socks or slippers in any of the UNIS laboratories. Personal protective equipment – gloves, glasses, and lab coats are all readily available in the chemistry lab, C208; it is important to use these to protect you. We have different types of gloves for different uses. Make sure to read your MSDS and know which personal protective equipment you should be using.

All ongoing projects (even if very temporary) must be labeled; all glassware, samples, and equipment that are being used need to be labeled with date, contents, and a name.

You must know the safety procedures and how to work appropriately in a laboratory to protect yourself and others from dangerous situations. Please remind each other to be safe and “stop the work” if you are uncertain.

More information on Lab safety, and fire and accident protocols is found in the Safety Instructions for UNIS labs.

## 4. Laboratory Routines

### Protocol writing

It is important for UNIS to gain knowledge from the work you do while at UNIS. It is therefore asked that a copy of your Standard Operating Procedure (protocol/method) be written and given to the Lab leader or AT Staff engineer, along with a risk analysis. These will need to be read through with the Lab leader or AT Staff engineer before you begin your work. Templates for these can be found on the UNIS webpage under the Lab services section, or ask the AT Staff Engineer or the Lab leader for a copy.

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## Chemicals

All chemicals stored in the chemistry lab cabinet have Material Safety Data Sheets located in a binder on the C208 lab bench. These sheets provide information on safe handling of chemicals, personal protective equipment, which actions to take in case of accident, and disposal. Make sure any MSDS for a substance you plan to work with is in this binder and has been read and understood before you start to work. If you have any questions or concerns, ask!

Extra bottles, and all other chemicals at UNIS are found in chemical storage C218, and a storage container outside. If there is a name on the bottle then this belongs to a specific project –do not use it. Otherwise chemicals found in chemical storage without a name are for common use. Be sure to mark the labels with the date when a new bottle is opened.

## Standards

Standards are kept in the fridge in C206. The MSDS binder for these substances is found on the bench in C208. When using the standards, weigh the bottle before and after and record the weight (as well as the amount taken) on the standard weigh sheet found in the binder on the lab bench. Make a note if emptied and always return the standards to their place in the fridge after using. Be sure to use the label maker if you are making a new vial; include: name of standard, concentration, date made, and made by. These are very expensive and should not be used without permission. Please ask the AT staff engineer or Environmental Technology PhD student before using.

## Lab equipment

Do not use any laboratory equipment without having been given prior instruction or training from an experienced user – always ask for help if you are unsure. This is for your own safety as well as for the maintenance of the instrument. Always leave the equipment in a condition that you would like to find it yourself. If equipment is broken or not functioning well, please notify the lab personnel.

Analytical balance – It is important to keep the balance clean; always check to make sure any spills have been properly cleaned and that the hooks on the weigh plate are sitting in place. Remember to use the ventilation hood if working with a substance that easily creates particles or vapours which shouldn't be inhaled. There is a balance room off of the teaching lab that has more analytical balances for use; there are also heavier balances in storage.

Muffle furnace – Do not put anything flammable inside the muffle furnace. Make sure no labels, tape, or paper is placed inside the oven or jammed in the door while it is hot. Wait for the furnace to cool down to below 100°C before opening it – it is very hot! There are heat protection gloves and tongs kept next to the muffle furnace for removing items.

Ultrasonic bath – The ultrasonic bath is most often used in C206 under the fume hood. Do not work in the same room when the ultrasonic bath is running. Use hearing protection when you are in the same room as the ultrasonic bath, and notify others working in the area. Hearing protection can be found in C206. Always have the door to the lab closed while the ultrasonic bath is running, and place a note on the door indicating the ultrasonic bath is in use and whom to contact. We use distilled water to fill our ultrasonic bath as this keeps it clean, and never place anything directly on the bottom of the bath, always use a rack.

TurboVap – We have three TurboVap units available for use. They are used for different matrices. The TurboVap 1 unit located in C208 is used only for air; the units 2 and 3 located in C206 are used for soil, sediment, and biota samples. Please regard these regulations. Make sure to use 15 drops of 'clear bath' and distilled water when filling the water bath; this will keep it clean and clear of growth. Note: the endpoint

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sensors have difficulties detecting coloured liquids. Therefore it is important to watch your sample if it is not completely clear in order to not lose your sample.

Glassware - The glassware in C208 is used only in C208 and for trace analysis only. It is important that it not be used for other purposes or taken to other labs. Some glassware is limited (ex. TurboVap tubes, columns and condensers), make sure to ask whether someone else is using them before beginning. There is also certain glassware that is used only for air extraction, these are labelled as such. Do not use these for any other work.

### General cleaning

While the cleaning staff cleans the floors and empty the trash bins, everything else in the laboratory is our responsibility. The lab is shared by many, and it is important to keep things tidy and clean. Always make sure that you have cleaned up after yourself and put common equipment back where they belong.

Everyone is responsible for cleaning dishes. They are rinsed, then labels are removed and they are placed in the dish washer. When it is full, turn it on. The washing machine uses detergent for the wash cycle and a quick drying agent in the disinfection rinse. It then rinses with distilled water. Otherwise, dishes can be washed by hand and rinsed with distilled water. Dishes are then hung on the drying racks to dry.

Glassware is burned at 450°C for 6 hours in the muffle furnace - Cover the glassware openings with foil.

Plastic is not burned; after washing place plastic in MeOH and give it 15min in the ultrasonic bath.

Metal is not burned; after washing place metal in acetone, 15min in the ultrasonic bath, then place metal in hexane for 15min in the ultrasonic bath - make sure to wash both sides of the spoon, etc.

Other glassware may need to be cleaned by solvent extraction or Extran bath (a labelled large black tub is located in C208 for this purpose). After being in the Extran bath, the glassware needs to be rinsed with plenty of distilled water before being dried and burned if possible.

### 5. Waste Routines

Segregation of waste is important. The two greatest divisions made with waste in our lab are the separation into halogenated and non-halogenated solvent waste. UNIS' Waste Management Guidelines are detailed in the file:

[http://www.unis.no/wp-content/uploads/2016/02/Waste\\_management\\_UNIS\\_2016.docx](http://www.unis.no/wp-content/uploads/2016/02/Waste_management_UNIS_2016.docx)

Please read this before beginning your lab work and refer back to it during your work. Ask the lab personnel if you have any questions about our waste routines

Note: As detailed in the Waste Management Guidelines, it is very important that only clean glassware is placed in the broken glassware receptacle. This box is left open in our lab where people are working every day, there cannot be residual vapours coming off of the glassware placed in that box.