

RULES AND BASICS FOR THE NANO-LABORATORY

1) Instructions and information

General:

- The lab can only be used by users which have received the proper training by authorized personnel.
- Use the shoe cover and step on the adhesive mat before you enter the Nano Lab.
- Parts being brought in for installation must be removed from their package if containing wood, cardboard or paper of any kind. Place empty packages in the garbage room (main elevator, level U1).
- **Tidy up** when you have finished your work and bring cleaned tweezers, scissors and beakers back to their original place!
- You can only use machines for which you have received the proper training, and are granted user status by authorized personnel.
- **Book machines** online under https://wiki.uib.no/nanolab/index.php/Main_Page, log in and book the equipment for your planning to use.
 - If you have **troubles** with a machine or an alarm signal appears, contact **immediately** Rachid Maad (+47 55 58 27 63).
- Read the file '**alarm signals and power failure**' to ensure you know how to react in emergency cases.

Restricted activities:

- Writing on gloves, equipment or clothes (only allowed on lab coat and cleanroom shoes).
- Use of tape (only cleanroom tape is allowed).
- Bring drink, food, chewing gum, bags, and coats.
- Use of tobacco in any form.
- Re-using shoe covers, booties, facemask, hair covers or gloves.
- Wearing of shorts, midriff tops, tank tops or hats.
- Bring paper/carton in the laboratory.
- Working in the cleanroom if you suffer from sneezing and coughing.
- Smoking shortly before entering (15 min).
- Sanding, drilling, sawing, filing, and welding.
- Any fast activities (running, walking fast, waving arms, slamming doors etc.)

Dress correct:

All necessary cloths, covers, etc. can be found in the cupboard or storage room of the laboratory.

- Wear clean freshly laundered clothes. Avoid wearing clothes made of wool (contamination due to fibers).
- When you enter the clean room area, change your shoes or use a second pair of shoe cover. DO NOT use cleanroom shoes from others!

- Put on a new HAIR COVER – Assure all hair is inside the cover (prevents stray hairs from being lost into the room).
- Put on a new BEARD COVER if you have facial hair.
- Put on a clean LAB COAT and button all the way up. Lab coats may re-used up to four times if in good condition. There are two different kinds of lab coats available: Kimberly-Clark, which does not protect you against chemicals and BioClean-D, which will protect you to a certain amount. Depending on your planed work, choose the right coat.
- Put on GLOVES and PROTECTIVE EYEWEAR.
- **Check yourself in the mirror before proceeding!**



Figure 1: Example of correct dressing.

Clean room:

- Bring **NO** paper/carton in the clean room. There are special books and pencils available.
- The usage of your mobile phone is also not allowed. In case of emergency there is a phone next to the hot plate.
- Any item brought into the cleanroom must be thoroughly wiped down with cleanroom tissue and Isopropanol. For this, use the fume hood in the semi-clean room.
- **Tidy up** when you have finished your work and bring cleaned tweezers, scissors and beakers back to their original place!

Safety:

- If you are working with strong acids/bases or other dangerous chemicals you are **not allowed** to be alone in the room. Always make sure there is a second person and also inform the person about your experiment.
- If you have problems with a machine DO NOT try to repair it – Contact Rachid Maad.
- Acid/Bases: Rinse affected area of your body at least 15 min with water. In case of HF: Use the HF-crème. You can find it attached to each fume hood.

Familiarize yourself with:

- The location of the extinguishing equipment and how it works.
- The nearest fire alarm.
- Escape routes.
- Safety shower, eye wash, HF antidote, and first aid kit.



You can find further information under:

<http://www.uib.no/poa/hms-portalen/sikkerhet/brannvern>

The University's security phone in a crisis (manned at all hours):
(+47) 55 58 80 81
UIB internal: 88 0 81

Giftinformasjonssentralen/Poison information 22 59 13 00

Fire 110
Police 112
Ambulance 113

In the event of fire / fire alarm:

- If you discover a fire:
 - Your own safety comes first.
 - If possible try to limit or stop the fire using the fire extinguishers found in the laboratory.
 - If this is not possible, close doors, leave the building, press the fire alarm and proceed to the mustering point (outside of the IFT).

2) Chemicals and Consumables

Working with chemicals:

- You may only use chemicals for which you have received the proper training by authorized personnel.
- Keep your working area clean. All used beakers and working surfaces **shall be cleaned!!**
- Be aware of potential hazards and safety measures (check either MSDS-folder or ECO online). For many substances there are NO toxicological studies and data. Those chemicals have always to be treated as toxic and potentially carcinogenic substances!
- To avoid contamination of substances **ALWAYS** pour from the original containers to smaller beakers or vials. **DO NOT** directly remove from the original containers using pipettes, spatulas, etc. Close original container tightly after use (especially with hygroscopic substances).
- Self-made solutions and fillings: have to be clearly **labeled** (chemical component, name of owner, date of mixing and if necessary hazardous symbol) and **well sealed** at the used work area or fume hood.
- Reactions in the fume hood: have to be clearly **labeled** (solvents, reactants, name, date, time). For overnight or unattended reactions you have to fill out a form. You can find laminated sheets in the fume hood.

Ordering:

- Check first if it is already available in the storage room, if not send the order to Rachid.Maad@ift.uib.no.

Received chemicals/consumables:

- Chemicals/consumables are stored in the Nano Lab storage room (different chemical cabinets labeled with acids, solvents, consumables).

- For Chemicals:
 - a. Write down the date of arrival and your name.
 - b. Write down the date of opening and your name.
 - c. Be aware of shelf life and storage conditions.
- If necessary update the “Material Safety Data Sheet”-folder next to the entrance of the Nano Lab and the folder in the group room. Also check the online database. If the database is not up-to-date send an email to Rachid Maad.

Safety information:

Read the material safety data sheet before starting to work with new chemicals. Use **always** a laboratory coat, protective shoes, goggles and protective gloves when working with chemicals.

- Check MSDS-Folder or
- ECO-online (database):
You only have reading rights. If you want to change or update the database send an email to Rachid Maad.

- How to use the **ECO-online**:
 1. <http://www.ecoonline.no/Logg-inn/>
 2. Log-in: Firmakode: 803
 Brukernavn: ift
 Password: ift

Figure 2: Login to chemical database ECO-online.

3. Click on 'Institutt for fysikk og teknologi.
4. Choose 'Nanolaber 1. og 2. etg'.

ECO Archive (Flerbruker IFT)

Helse vest - UIB
Administration

- Institutt for fysikk og teknolog
- Akustikklab aud 1.
- E-laber
- Flerfaselaboratoriet (rom 259)
- Hydrodynamikk/akustikk lab
- Mekanisk Verksted
- Målevitenskap lab 263
- Nanolab tak
- Nanolaber 1. og 2. etg. 2.
- Nanolab 1.etg (pumperom)
- Nanolab E-line rom 274 b
- Nanolab renrom 268
- Nanolab snekkerverksted 16
- Optikklab 1.etg syd
- Partikkel (renrom 324)
- Prosess sikkerhet rom 271
- Prosess/sikkerhet tak
- Reservoar
- Romfysikk
- Sprittlager
- Strømningslab 267(Alex)
- Studentlaver rom 260

Active products Location Inactive products Multiple printout Legislation

Nanolab 1.etg (pumperommet)

Product name	Company name	Revised	Type	H
Argon ; Argon BIP; Argon Integra; Mapcon Argon	Yara Praxair AS (ENG/NOR)	20.01.2013	Short version	

These products are not available in English:

Product name	Company name	Revised	Type	H
Helium	Yara Praxair A/S	03.01.2013	Short verslon	
Helium	Yara Praxair A/S	03.01.2013	Short version	
Kvåve ; Nitrogen; Nitrogen Lazer; Nitrogen Lazer Prosess; Nitrogen Ph. Eur.; Mapcon Nitrogen; Nitrogen Levnedsmiddel	Yara Praxair AB	25.01.2013	Short version	
Kvåve, kylid flytande ; Nitrogen Bulk (LIN); Nitrogen Bulk (LIN) Lazer; Nitrogen Ph. Eur. flytende; Mapcon LIN	Yara Praxair AB	30.01.2013	Short version	

Search Advanced search Reports

Local search

Search only for words- or parts of words- you are completely sure of.

Product name

Company name

Use area (SDS)

CAS no.

Article no.

Internal no.

Search type Starts with Contains

Show

Language

Figure 3: ECO-online archive.

- Choose a chemical and all available data will be shown (MSDS, product information, storage place).

The screenshot shows a web application interface for chemical management. The top section, titled 'Active products', displays a table of products. The product '(Diethylamino)acetone' is highlighted with a red circle. Below this, the 'Safety data sheet' section is visible, showing the title 'SIKKERHETS DATABLAD' and 'Forkortet versjon (Lenk til fullversjon nedenfor) (Diethylamino)acetone'. The 'Seksjon 1: Identifikasjon av stoffet / blandingen og av selskapet / foretaket' section provides identification details for (Diethylamino)acetone, including its CAS number (1620-14-0) and EC number (216-583-1).

Product name	Company name	Revised	Type	H
(Diethylamino)acetone	Sigma-Aldrich Norway AS	03.08.2012	ECO +	
2-Propanol	VWR INTERNATIONAL AS	17.06.2008	Short version	
Developer for Photoresist ma-D 532	micro resist technology GmbH	04.03.2008	ECO +	
Framkallare för positiv fotoresist	Scankemi	Expired	ECO +	
Helium	Yara Praxair AB	03.01.2013	Short version	
METANOL (554)	KPT Naturfag	Expired	ECO +	
NMP(N-Metyl-2-pyrrolidon)	NO SHIT AS	Expired	Short version	

Figure 4: Chemical selection and information sheet.

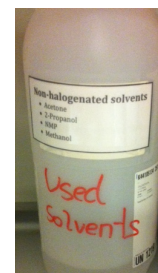
If chemicals are not in the database or in the MSDS-folders you can find safety information online under <http://www.sigmaaldrich.com/norway.html>.

3) Waste

Disposal in the lab:

Following waste containers are available in the fume hood:

- **Non-halogenated solvents** (e.g. acetone, isopropanol, NMP, methanol) and **halogenated solvents** (e.g. chloroform): Self-made solutions and mixtures must be emptied into the appropriate containers. **NOT IN THE BASIN! Exception:** Acids and bases diluted with water. A neutralizer carries out neutralization.



- Closed container for needles and sharps (broken Si-wafer or glass slides).

- Little “waste-bin” for contaminated (also isopropanol and acetone) tissue. **Empty** the waste bin **daily** into the yellow rubbish bin.

Non-contaminated tissue and plastic can be directly disposed in the yellow big rubbish bin.



IMPORTANT: Empty chemical bottles, glass vials, needles, and other sharps shall not be disposed as household waste. When the glass is broken, there might be chemical residues left that can cause great damage to humans.

- **Problematic waste** shall be packed in **yellow** plastic containers. When the container is filled up, it has to be sealed. Empty chemical bottles and vials should be completely empty and evaporated (leave them over night open in the fume hood) before they can be disposed as problematic waste.
- **Labeled original packaging** or other labeled appropriate container **containing hazardous waste** has to be put in the **red** plastic containers with lids.
- **Solvent cans:** Used solvents have to be accumulated in special plastic cans. Therefore decant used solvents from the “intermediate storage bottle” into the can (never fill up more than $\frac{3}{4}$). Empty plastic bottles (*e.g.* acetone or isopropanol) are used as intermediate storage bottles. Make always sure, that everything is stored at a good ventilated room.



There are two different colors on the cans, depending on the solvent:

BLUE cans: For halogenated solvents containing fluorine (F), chlorine (Cl), bromine (Br), iodine (I) and astatine (At).

WHITE cans: For solvents that do not contain halogen (acetone, isopropanol, methanol, NMP).

You can find the cans in the storage room in the chemical cupboard. There is a big difference in cost for disposal of solvents with or without halogen - so **do not** mix them. **Remember:** It is very important that the packaging is **labeled** correctly with name.

Temporary storage/pick up locations for hazardous waste and problematic waste is at Realfagbygget. There is a special room in the basement and you can lend the key for the room (opening hours 9-11 h). For temporary storage you can bring the waste to Per Heradstveit, Department of Physics and Technology. At those two places you also get empty red and yellow containers and solvent cans.

Under <http://www.uib.no/poa/hms-portalen/en/environment/waste/hazardous-waste#declaration> you can find the file for declaration. There are also printed files at the pick up locations. Write down all the used chemicals (if you are not sure ask Rachid Maad).

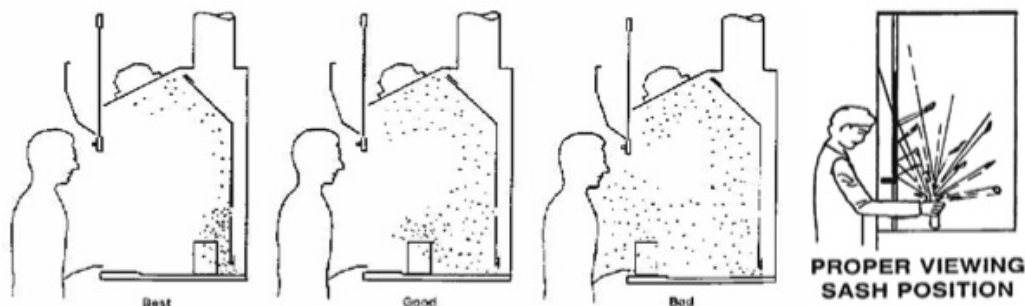
Further information you can find under: <http://www.uib.no/poa/hms-portalen>. If you are not sure how to dispose special waste ask Lisbeth Glærum, Department of Chemistry (Lisbeth.Glarum@kj.uib.no).

4) Fume hoods

Fume hoods protect you from fumes you are working with. This system works only if you bring the sash down at least 2/3 of the way.

How to use a fume hood correctly:

- Perform all work involving hazardous or volatile materials in a fume hood.
- Check that the fume hood is operating correctly before you start to work. Check operation lights of the fume hood (green: OK, red: NOT working). Check also the airflow by watching the attached tissue in the fume hood. Always keep work at least 15 cm away from the opening of the fume hood.



- Use the sash as a safety shield when boiling materials or conducting an experiment with reactive chemicals. Always keep sash as low as possible.
- When the fume hood is not in use, ensure that all materials are in sealed containers (close ALL containers).
- If the fume-hood is not working correctly please call Rachid Maad (+47 55 58 27 63).
- Prepare a plan of action in case of an emergency, such as a power failure, especially when using extremely hazardous chemicals or acids. HF antidote gel is taped on the left side of the fume hood. A spill kit is stored under the fume hood. The eyewash and body shower are next to the emergency exit of the laboratory. Further rinse contaminated part of your body at least for 15 min with water.
- For long-term experiments fill out the overnight / unattended experiment form and post on the sash of fume hood.

DON'Ts:

- DO NOT place your face or head inside the hood. Keep hands out as much as possible (change gloves if they are contaminated).
- DO NOT use a fume hood as a storage area, they should contain only working volumes of chemicals.

- DO NOT modify a fume hood for chemical or equipment storage.
- DO NOT place extension cables or other spark producing sources inside the hood.

5) Spill management:

As a major part of any laboratory work, you should evaluate the consequences of potential spills and you must identify the potentially hazardous properties of all chemicals you use (material safety data sheets). Before starting any work with chemicals, verify that all necessary safety equipment and cleanup materials are available. Most importantly, before cleaning up a simple spill, be sure that you can do it safely. **You must have the right protective equipment (gloves, goggles, lab coat, etc.).**

Under the fume hood in the semi-clean room is a spill kit available. This contains cushions (to avoid further spreading), absorbent tissues, special gloves and disposal bags. In the cleanroom are special absorbent tissues stored under the fume hood. You also find gloves, safety goggles and a waste bag.

The following steps should be taken during spill cleanup:

- Prevent the spread of dusts and vapors: If the substance is volatile or can produce dusts, close the laboratory door and increase ventilation (*e.g.* through fume hoods) to prevent the spread of dusts and vapors to other areas.
- Control the spread of the liquid: Make a dike around the outside edges of the spill. Use absorbent materials such as spill pillows or absorbent tissue (stored under the fume hoods).
- Absorb the liquid: Add absorbents to the spill or use absorbent tissue, working from the spill's outer edges toward the center.
- Collect and contain the cleanup residues: The spill residue or the absorbent should be wiped or otherwise placed into plastic bags and in the yellow waste container (**label** the container).

I hereby declare that:

- I have read and understood the guidelines in the “Basic for the laboratory” document.
- I have been shown how to dress correctly for working in the laboratory.
- I am familiar with the safety equipment available in the lab and I know how to react in case of a power failure / alarm signal. I have read and understood the guidelines in the “alarms and power failure” document.
- I have been shown how to dispose chemicals and wastes correctly.
- I have been shown how to properly work with chemicals and how to get information about the hazards (MSDS).
- I’m familiar with the “buddy” concept and will not leave the lab if other users are working with chemicals.
- I’m responsible for my own actions and any other persons which I allow access to the lab.

Failing to comply, can lead to limited access to the lab or in worst cases the user will be expelled from the lab.

New users name :

Date:

Name of lab assistant: