

Safety Instructions 2020/2021



Magnetic Nanostructure Characterization Technology & Applications

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Health and Safety Briefing



Poisonous



Magnetic field



Gas cylinder



Water



Waste disposal



Workshop



Electricity in offices and laboratories

- Protective systems of our water supply.
- When and how to use ladders in a safe way.
(instead of using chairs and / or other equipment)
- First aid kits in closet.
- How & when to use these special phone numbers:



199



166

How to recognize risks in workplace

- Unusual behavior of computers **bad smell, funny signs on displays.**
- **Smoke coming out** from the power supply of electrical equipment.
- **Smell from leaked solvents** or other chemicals.
- **Sudden appearance of water** on surfaces / floor / ceiling.

If you call the emergency services

Be prepared to answer the following questions:

- Who are you ?
- What happened ?
- Where did it happen ?
- How many persons are hurt ?

Important: Do not hang up !
Wait for further questions !



Important instructions to new colleagues

General rules:

Everybody has to attend our annual safety instructions before starting to work in our labs.

! Without reading: working in our labs is prohibited !

- New colleagues must not start without being instructed.
- Supervisors instruct new colleagues frequently and intensely!
- New colleagues must be checked frequently.

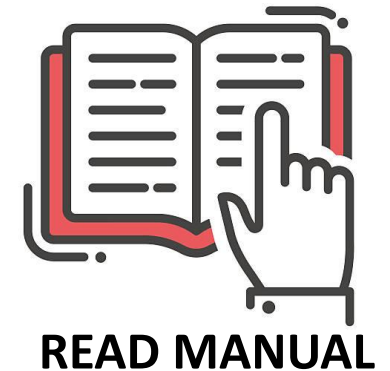
Important instructions to new colleagues

Give them general and special directives about our lab:

- Tell them what they have to do if any hazardous
 1. problem occurs in the lab
 2. worst case: supervisor is absent

- Instruct them in detail about handling of the equipment
 1. Show them the location of the appropriate manuals
 2. Write manual for self assembled instruments
 3. Users **MUST read** these manuals carefully frequently

- Point out situations which can lead to hazardous conditions while working in our labs.



Behavior in the Lab

- Please do not start talking to your colleague when she/he is concentrated on her/his work.
- This is of particular importance if somebody is working in the fume hood somehow shielded from the outside.
- If a colleague is suddenly deviated from his work it can lead to unwanted and possibly dangerous re/actions of her/him.

Please wait until work is finished or the colleague talks to you!

Important instructions to new colleagues

- Explain when to use and how to handle.
- Personal protective equipment usage of protective clothing, respirators, safety goggles.
- Show them the handling of liquefied nitrogen with our cryogenic equipment.

Please! Really do this! We had several minor incidents!

- During their first period of time in our labs new colleagues must do their work under control by a trained supervisor only.

Emergency by Water

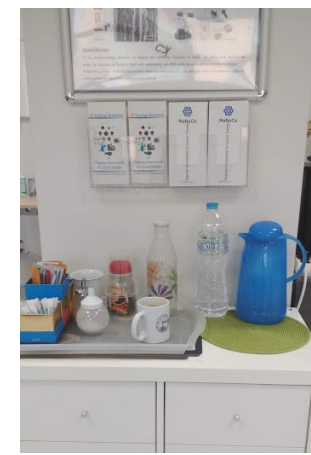
Distilled water

- Not intended for drinking at all
- prepared with chemicals or polluted
- can potentially threaten your health



Drink water

- the only water supply for coffee and tea
- available in “table coffee”



Motorized water valve in hyperthermia:

- Test your taps.
- Can be opened and closed manually.
- Needs free space around handle to be able to move!



Ultrasonic- and water bath

- Always take care of the water level in the ultrasonic bath: if it is not filled to the inside level marker it might get destroyed
- Don't use their heaters at maximum power for long time: the adhesive bond from the transducers to the pan can become soft and the ultrasonic bath would be damaged
- Clean it directly after each use!

Hyperthermia



Chemistry laboratory

Never work alone in the chemistry lab if there is a risk of serious accident!

1. Always use lab coats, gloves and safety goggles.
2. Long hair must be tied back
3. Shoes must fully cover feet
4. Do **NOT** taste or smell chemicals
5. **NO** eating and drinking inside lab
6. Always work in a well ventilated area
7. Everyone who works there must take care of it and must keep it in an ordered state!!!

MY SAFETY ESSENTIALS	MY SAFETY RECOMMENDATIONS
 <p>Safety glasses must be worn as a minimum when using power tools or chemicals. Wear safety goggles to protect your eyes when using rotary equipment generating debris.</p>	 <p>Close fitting or protective clothing is encouraged.</p>
 <p>Appropriate enclosed footwear should be worn. A screwdriver to the foot is never fun.</p>	 <p>Protective gloves should be worn. Use hand protection when handling hot materials.</p>
 <p>Hearing protection must be worn when noise levels are excessive.</p>	 <p>Gloves must NOT be worn when using this equipment. Gloves can be hazardous when using rotating machinery.</p>
 <p>A mask must be worn when excessive airborne dust is created.</p>	 <p>Rings and jewellery should not be worn as they might be caught in construction material or tools.</p>
 <p>Long and loose hair must be contained or securely tied back..</p>	

Chemistry laboratory



Chemical cabinet

1. Labels and equipment instructions must be **read carefully** before use.
2. **Check the label** on all chemical bottles **twice** before using any of the contents.
3. Take **only as much chemicals** as you need.
4. **Never return** unused chemicals to their original container.

Material Safety Data Sheet: <https://www.msds.com/>

Ordering new chemicals

If you need chemicals which we don't have in stock in our safety cabinet, please talk with the supervisors.

Listing of Chemicals

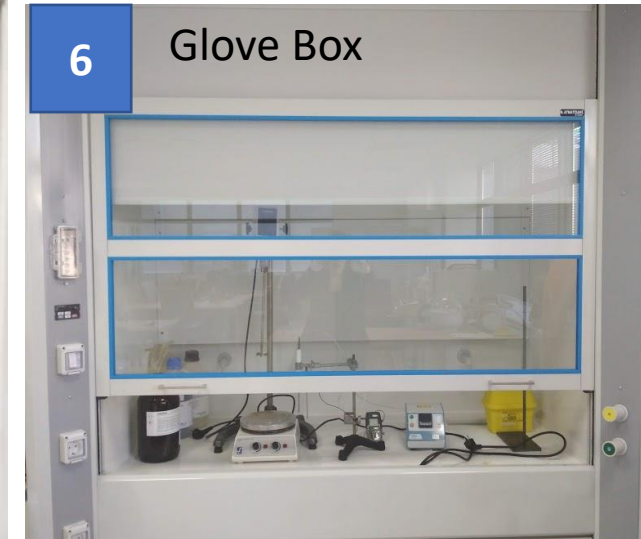
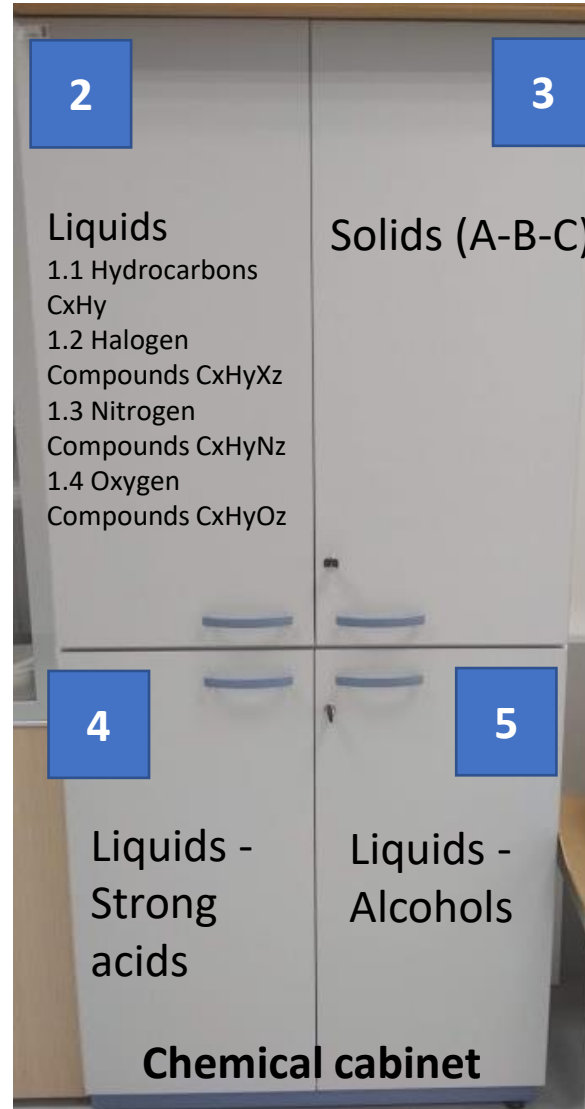
The containers with the chemicals must be labeled with the user name, the date and added to the stock list in google drive.

1. Lab coats, gloves
2. Liquids
 - 1.1 Hydrocarbons C_xH_y
 - 1.2 Halogen Compounds $C_xH_yX_z$
 - 1.3 Nitrogen Compounds $C_xH_yN_z$
 - 1.4 Oxygen Compounds $C_xH_yO_z$
3. Solids (A-B-C)
4. Liquids - Strong acids
5. Liquids - Alcohols
 - Acetone
 - Isopropanol
 - Oxalic acid
 - Hydrogen peroxide
6. Glove Box
7. Fridge
8. Freezer (όταν έρθει)

Use Labels:

- Content can be clearly identified for everybody
- Disposal is much easier and more safe
- You know how to proceed in case of emergency

Listing of Chemicals



Housekeeping: order and cleaning

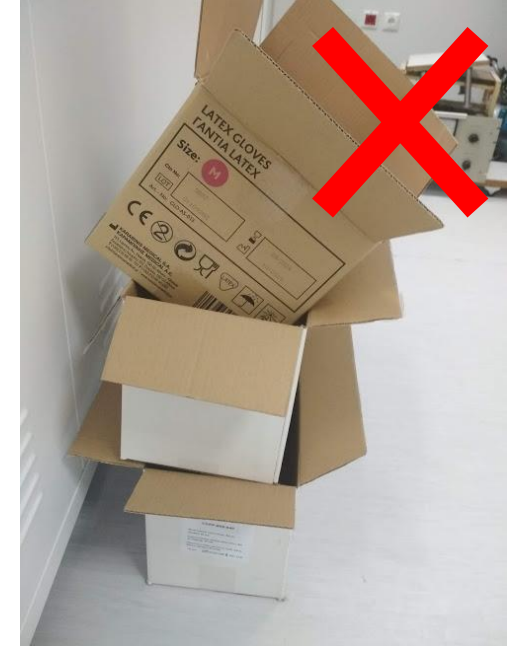
Work areas should be kept clean and tidy at all times.

Clean surfaces:

- Solids in balance
- Liquids in chemistry lab



Sinks are to be used for water only



CLEAN EVERYTHING DIRECTLY!!

First aid

1. If a chemical splashed onto your skin:
Immediately flush with clean drinking water for at least 10 minutes
2. If a chemical splashed in your eye(s):
Immediately use emergency eye wash station



Treatment of chemical waste

In the chemistry lab we store **four** waste containers (blue 10L steel barrels with polyethylene insert).

1. **Inorganic:** mixed acids
2. **Inorganic:** mixed bases
3. **Organic:** solvents free from halogens
4. **Organic:** solvents with halogens

Do NOT mix these!



Attention

Be careful with mixtures that can develop gases:

- ($\text{HNO}_3 + \text{HCl}$)
- ($\text{HCl} + \text{H}_2\text{O}_2$)

Broken glass

1. Never handle broken glass with your bare hands
2. Place broken glass in the designated glass disposal container.

High magnetic fields – General rules

- Persons with active and passive implants must keep away if energized
 - keep distance to magnet if possible
 - keep mobile magnetic material away from the magnet
 - hammer, screw driver, screw wrench
 - iron made ladders, transport cars, etc...
- The operator must instruct other persons approaching.
- If the magnetic field is increased in automatic mode and the operator is absent take care that also non instructed persons keep away (put sign on door e.g.).

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