

Geo Lab room U247 – Syrelab
room U249 – Våtlab

Hygiene and safety instructions



Geo Lab

Department of technical and scientific conservation |
Seksjon for konservering og forskningsteknikk

U247 – Syrelab

U249 – Våtlab

- Sample preparation

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1. Introduction

The Geo Lab at the Natural History Museum, University of Oslo, has two rooms dedicated to the work with chemicals. These rooms are equipped with fume hoods, ventilated storage for chemicals, diverse equipment for weighing and sample preparation, and assorted glassware.

Use of the Geo Lab room U247 – Syrelab and U249 – Våtlab is restricted to trained personnel familiar with the user instructions, general safety precautions, and laboratory rules. Contact the laboratory manager or your supervisor/group leader to get permission to use this lab room.

2. General safety rules

- Avoid working with hazardous materials when alone in the building. If working alone cannot be avoided, please notify the lab manager, your supervisor or other NHM staff member when and for how long you will be using the lab. Once you finish your work remember to notify them again!
- Food and drinks are not allowed in this room (including bottled water and chewing gum).
- Never leave an experiment unattended.
- Report all injuries, accidents, damaged equipment, and broken glass right away, even if the incident seems small or unimportant.
- Know emergency procedures and contacts.
- Make sure you know where the lab's safety equipment – first aid kit, fire extinguishers, eye wash stations, safety showers - is located and how to use it.
- Make sure you are familiar with the emergency exits location and meeting point in case the building needs to be evacuated.

3. Housekeeping safety rules

- Make sure that all eyewash stations, emergency showers, fire extinguishers, and exits are always unobstructed and accessible.
- Keep work area neat and free of any unnecessary objects.
- Do not block the sink drains with debris.
- Wash, clean and organize the laboratory material and bench surfaces that you used in your experiment before leaving the lab.

4. Personal protection safety rules

- Always use safety glasses when working with chemicals, glassware, and/or heat.
- Always wear disposable gloves when handling chemicals. Remember that that gloves are not universally protective against all chemicals (consult Annex 2 for further information about gloves types).
- Wear a full-length, long-sleeved laboratory coat when performing laboratory experiments (Annex 1 - Routine to use and clean the lab coats).
- Wear shoes that adequately cover the whole foot; low-heeled shoes with non-slip soles are preferable. Do not wear sandals, open-toed shoes, open backed shoes, or high-heeled shoes in the laboratory.
- Secure long hair and loose clothing (especially loose long sleeves, neck ties, or scarves). Remove jewelry (especially dangling jewelry).
- Keep your hands away from your body, mouth, eyes and face when using chemicals and lab equipment.
- Remove any protective equipment (i.e., gloves, lab coat, safety glasses) before leaving the laboratory.
- Always wash your hands with soap and water after performing an experiment and before leaving the lab.

5. Safe handling of chemicals

- Before starting an experiment, read the Material Safety Data Sheet (MSDS) for all the chemicals you are going to use. The MSDS for each material used in our lab are available electronically at ECOonline. Always follow the MSDS recommendations for safe use, storage, and disposal of the chemical. (See Annex 3 for more details about ECOonline).
- Do not store chemicals in the lab bench, on the floor, or in the chemical hood. Always store chemicals in the ventilated chemical storage drawers and shelves, located under and by the side of the chemical hood respectively.
- If possible, keep all chemicals in their original containers. If you need to transfer chemicals from their original containers, always use lab approved containers and label the containers as to the contents, concentration, hazard, date, and your initials. *NOTE: You can use ECOonline to print chemical labels. Contact the Laboratory Manager if you need help with this.*
- Always wear appropriate personal protection equipment when handling chemicals (see section 3).
- Check the label to verify it is the correct substance before using it.
- Weigh out or remove only the amount of chemical you will need. Do not return the excess to its original container, but properly dispose of it as instructed by the MSDS (Annex 3).
- Use the chemical hood when there is a possibility of release of toxic chemical vapors, dust, or gases. When using a hood, the sash opening should be kept at a minimum to protect the

user and to ensure efficient operation of the hood. Keep your head and body outside of the hood face. Chemicals and equipment should be placed at least 15 cm within the hood to ensure proper air flow.

- Never touch, taste, or smell any reagents. Never place the container directly under your nose and inhale the vapors.
- Chemicals should never be mixed, measured, or heated in front of your face. Hold containers away from the body when transferring a chemical or solution from one container to another.
- When transporting chemicals (especially 250 mL or more), place the immediate container in a secondary container or bucket (rubber, metal or plastic) designed to be carried and large enough to hold the entire contents of the chemical.
- Clean up all spills properly and promptly.
- In the event of chemical splashing into your eyes or on your skin, yell out immediately for help, and flush the affected area(s) with running water for at least 20 minutes.
- Always use a spatula or scoopula to remove a solid reagent from a container.
- Use a hot water bath to heat flammable liquids. Never heat directly with a flame.
- Add concentrated acid to water slowly. Never add water to a concentrated acid.

6. Disposal of chemicals

- Chemicals and special trash (e.g. batteries) are disposed in the Waste Station (Miljøsafe) located outside by the parking space.
- Inside the Waste Station there are buckets to sort the chemicals and special trash according to its characteristics in accordance to the guidelines of Norsk Gjenvinning, the Waste Station supplier responsible for its maintenance.
- Contact Bjørn Lund (bjorn.lund@nhm.uio.no; 22851653) for access and guidance on how to sort your trash.



7. Use of logbook and laboratory journals

- All activities performed in the lab must be registered in the Logbook.
- Please fill in all fields in the Logbook without exception.
- The Logbook is to be kept in the lab, in a visible and accessible place. Never remove the Logbook from the lab.
- Additionally, according to the rules of The Faculty of Mathematics and Natural Sciences, the keeping of personal Laboratory Journals is mandatory in all experimental disciplines. Journals should be kept in such a way that others can replicate the experiments.
- General guidelines for use of Laboratory Journals:
 1. Supervisors/group leaders/project managers are responsible for ensuring that all those involved in their group or project keep a laboratory journal according to current guidelines.
 2. A laboratory journal is personal and must be kept by one person.
 3. Failure to submit journals on termination of employment may prevent administrative check-out and the issue of diplomas and may be prosecuted. It is permissible to copy one's own laboratory journal and take it with one to a new place of work.
- Information about the Laboratory Journal and guidelines for its use can be found at: <https://www.mn.uio.no/english/about/hse/laboratory-journal/>
- Detailed guidelines for the use of the Laboratory Journal at the Geo Lab can be found in Annex 4.

8. Emergency procedure

- Know the location of all the exits in the laboratory and building, as well as the meeting point in case of evacuation.
- Know the location of the nearest phone and list of emergency contacts.
- Know the location of and know how to operate the following:
 - Fire extinguishers
 - Alarm systems
 - Fire blankets
 - First-aid kits
 - Eye washes
 - Safety showers
- In case of an emergency or accident, follow the established emergency plan and evacuate the building via the nearest exit.

9. Emergency contacts

Fire: 110 (follow the UiO General Rules in Case of Fire)

Ambulance: 113

Police: 112

In case of unexpected incidents during the use of the lab (for example if an alarm goes off), contact immediately one of the persons listed below.

Lab manager, Nélia Castro

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Professor, Hans Arne Nakrem

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Annex 1: Routine to use and cleaning of lab coats

Routine for use of lab coats:

- Always use a lab coat when working in the Syrelab.
- Frequent users of the lab shall choose a lab coat and identify it with his/her name.
- Sporadic users can use one of the lab coats identified with the word "Guest".
- Always remove the lab coat before leaving the lab. IMPORTANT: DO NOT store your lab coat in your office, always leave your lab coat in the lab.

Routine for cleaning the lab coats:

- Each user is responsible for his/her lab coat maintenance (e.g. cleanliness, integrity, identification, appropriate storage).
- Wash your lab coat promptly in the event of chemical splashing into your lab coat. The clothes washing machine in room U249 (Våtelab) can be used. Contact the laboratory manager or deputy if you need help with this task.

Annex 2: Chemical Permeation breakthrough times for different types of laboratory gloves

Different glove types offer different protection when in contact with a chemical substance. Therefore, it is important to choose the right kind of gloves to the work you are performing. Consult the Safety Data Sheet of the chemical you are going to use to know what glove type is indicated to your work.

The following table summarizes the level of protection of different glove types against different chemicals. The chemical permeation breakthrough time is measured in minutes and indicates how long it will take until the chemical that came in contact with your glove will reach your skin. To ensure maximum protection, you should replace your gloves as fast as possible when a chemical enters in contact with your gloves. For more information about the use of gloves in the lab and its different types, contact the laboratory manager or consult www.kimtech.eu .

Table 1: Chemical Permeation breakthrough times (in minutes) according to EN374-3:2003.

EN374-3:2003 Permeation breakthrough times								Breakthrough time (minutes)		
Class	0	1	2	3	4	5	6	GREEN NITRILE	STERLING* Nitrile	PURPLE NITRILE*
Time	<10	10-30	30-60	60-120	120-240	240-480	>480			
Usage	Not recommended	Splash protection		Medium protection		High protection				
Chemicals	CAS Number	Type	Scientific applications	REACH Symbol						
Acetic acid, concentration 10%	64-19-7	Organic acid	Chemical synthesis		>480	>480	>480			
Acetone, concentration 99.8%	67-64-1	Ketone	Solvent for laboratory cleaning, oxidation, SN2 reactions		<2	<2	<2			
Acetonitrile, concentration 99.9%	75-05-08	Nitrile	Chemical synthesis, liquid chromatography, DNA analysis		<2	<2	<2			
Acrylamide, concentration 40%	79-06-1	Amide	Electrophoresis, DNA analysis		>480	>480	>480			
1-Butanol, concentration 99%	71-36-3	Alcohol	Chemical extraction, liquid chromatography		<2	32	50			
Citric acid (monohydrate), concentration 30%	5949-29-1	Organic acid	Passivate high-purity process piping in biotech and pharma industry		>480	>480	>480			
Cyclohexane, concentration 99.7%	110-82-7	Solvent	Solvent, analysis, calibration of differential scanning calorimetry		28	>480	>480			
Dichloromethane, concentration 99%	75-09-2	Chloro-Hydrocarbon	Solvent for organic compounds, plastic welding adhesive		<2	<2	<2			
Diethylether, concentration 99.9%	60-29-7	Ether	Solvent, liquid-liquid extraction		<2	<2	<2			
Dimethyl Sulphoxide, concentration 99%	67-68-5	Solvent	Polymerised chain reaction, organic synthesis, extractant in biochemistry		16	21	57			
Ethanol, concentration 70%	64-17-5	Alcohol	General purpose solvent		16	26	59			
Ethidium bromide, concentration 1%	1239-45-8	Intercalating agent	Fluorescent tag for electrophoresis		>480	>480	>480			
Formaldehyde, concentration 37%	50-00-0	Aldehyde	Chemical synthesis		>480	>480	>480			
Glutaraldehyde, concentration 50%	111-30-8	Aldehyde	Biochemical synthesis, creation of toxoid vaccines		>480	>480	>480			
Hydrochloric acid, concentration 30%	7647-01-0	Inorganic acid	Chemical synthesis, pH regulation, ion exchange		210	397	>480			
Hydrochloric acid, concentration 37%	7647-01-0	Inorganic acid	Chemical synthesis, pH regulation, ion exchange		43	88	173			
Hydrogen peroxide, concentration 30%	7722-84-1	Oxidizing agent	Disinfectant, antiseptic, oxidizer		15	>480	>480			
Isopropanol, concentration 70%	67-63-0	Alcohol	Solvent, Disinfectant, Cleaning electronic devices		27	103	144			
Methanol, concentration 99%	67-56-1	Alcohol	Solvent, electrophoresis		<2	<5	7			
Nitric Acid, concentration 50%	7697-37-2	Inorganic acid	Chemical synthesis, strong oxidizing agent		11	13	60			
Nitric Acid, concentration 70%	7697-37-2	Inorganic acid	Chemical synthesis, strong oxidizing agent		<2	<5	9			
Sodium hydroxide, concentration 40%	1310-73-2	Base	pH regulation, organic synthesis		>480	>480	>480			
Sodium hydroxide, concentration 50%	1310-73-2	Base	pH regulation, organic synthesis		>480	>480	>480			
Sulphuric acid, concentration 50%	7664-93-9	Inorganic acid	Dehydrating agent, many industrial applications		>480	>480	>480			
Sulphuric acid, concentration 95%	7664-93-9	Inorganic acid	Dehydrating agent, many industrial applications		<2	6	10			
Toluene, concentration 99.9%	108-88-3	Aromatic hydrocarbon	Solvent, fullerene indicator, carbon nanotubes, hemoglobin extraction		<2	<2	<2			
Xylene, concentration 99%	1330-20-7	Aromatic hydrocarbon	Solvent, cleaning agent for steel, silicon wafers, chips, and dry ice baths		<2	<2	<2			

Data given are based on results of tests performed in accordance with EN374-3:2003, by an independent laboratory. These tests may not adequately replicate any specific condition of use. Kimberly-Clark has no detailed knowledge or control over the conditions of end use, therefore data must be for advisory purposes only, and Kimberly-Clark must decline any liability.

Annex 3: ECOonline

The University of Oslo uses an online chemical database called ECOonline for easy access to Material Safety Data Sheets (MSDS). All chemicals used at NHM and respective locations must be registered in ECOonline.

Everybody at NHM must familiarize themselves with ECOonline so they know where and how to find MSDS when needed. You can check the tutorials when you have logged in. NHM have a common reading user to access ECOonline.

Login instructions to ECOonline:

<https://app.ecoonline.com/ecosuite/login/login.php?loginLang=1>

Choose language: Norsk/English

Firmakode: 29435

Brukernavn: NHMalle

Passord: NHM2019les

For help and questions contact the laboratory manager.

Annex 4: Guidelines to use of Laboratory Journal at the Geo Lab



UiO : Naturhistorisk museum

Laboratoriejournal Laboratory Journal



UiO : Naturhistorisk museum

Innledning

- Føring av laboratoriejournal er obligatorisk i alle eksperimentelle fag.
- Hovedformålet er å dokumentere laboratoriearbeid som eventuelt skal publiseres.
- Et sekundært mål med laboratoriejournalen er å gi grunnlag for patenter.
- Journalen skal føres på en slik måte at andre kan gjenta forsøkene.

Introduction

- Keeping an approved lab journal for all experimental work is mandatory.
- A primary purpose of a laboratory journal is to document experimental work that may be published.
- A secondary aim with the laboratory journal is to be used as documentation in a patent application.
- It must include enough detail for someone else to successfully replicate your experiments.

Innledning

- Journalen er UiOs eiendom, og må innleveres ved utklarering eller når prosjektet avsluttes.
- Laboratoriejournalen skal oppbevares forsvarlig av instituttet eller avdelingen i minst 10 år etter forsøkene er avsluttet.

Introduction

- The journals are UiO's property and have to be returned at the end of employment or when the project finishes.
- The laboratory journals should be kept in safe storage for at least 10 years by the institute or department.

Generelle retningslinjer

1. Veileder/gruppeleder/prosjektleder har ansvar for at alle som deltar i hans/hennes gruppe/prosjekt fører laboratoriejournal etter gjeldende retningslinjer
2. Laboratoriejournalen er personlig og skal føres av en person
3. Manglende innlevering ved endt arbeidsforhold kan hindre utklarering, utlevering av vitnemål og straffefølges. Det er lov å kopiere fra egen journal og ta dette med seg til ny arbeidsplass.

General guidelines

1. The supervisor/group leader/project leader is responsible for ensuring that all those who participate in his/her group/project keep personal laboratory journals according to the given guidelines.
2. The laboratory journal is personal and should be written by one person.
3. Failure to return the journal at the end of employment may hold back clearance and diplomas, or even be prosecuted. Copying from one's own journal and bringing copies to a new place of work is allowed.

Laboratoriejournal Økern

- Alle som fører eksperimentelle fag må ha en laboratoriejournal uavhengig av han/hennes stilling eller seksjon
 - Mineralogisk forskningsgruppe
 - Norske senter for paleontologi
 - Seksjon for konservering og forskningsteknikk
 - etc.

Laboratory Journal Økern

- Everybody who conduct experimental work must have a laboratory journal independently of his/her position or department
 - Mineralogy group
 - Norwegian centre for paleontology
 - Department of technical and scientific conservation
 - etc.

Laboratoriejournal Økern

- Alle laboratoriejournaler må registrere
- Filen for registrering finns i mappen:
Q:\Økern-lab\Laboratory journals
- Veileder/gruppeleder/prosjektleder har ansvar for at alle som deltar i hans/hennes gruppe/prosjekt fører laboratoriejournal.

Snakk med Nélia Castro om du behøver en ny laboratoriejournal eller om du behøver hjelp med registrering av laboratoriejournalen.

Laboratory Journal Økern

- All laboratory journals have to be registered
- The file for the registration can be found in the folder:
Q:\Økern-lab\Laboratory journals
- Supervisor/group leader/project leader is responsible for ensuring that all those who participate in his/her group/project keep personal laboratory journals.

Talk with Nélia Castro if you need a new laboratory journal or need help to register a laboratory journal.

Føring av journal

1. Bruk permanent blekk, ikke blyant. Bruk gjerne flere farger.
2. Bruk ikke slanguttrykk eller sjargon uten forklaring.
3. Fjern aldri sider.
4. Fjern aldri data eller tekst i protokollen. Sett en strek over avsnittet, og før på initialene dine. Korreksjoner beskrives i nærheten av rettelsen.

Recording data

1. Use permanent ink, not a pencil. Feel free to use several colours.
2. Do not use slang expressions or jargon without explaining.
3. Never remove pages.
4. Never erase or remove test/data. Draw a line through, and sign your initials. Enter the correct entry nearby.

Føring av journal

5. Side A0000-1 er ment for spesifikk informasjon, regler eller retningslinjer fra instituttet eller prosjektet.
6. Side A0000-4 – 8 er for innholdsfortegnelse til eksperimenter. Innholdsfortegnelse skal inneholde:
 - sidetall
 - tittel
 - dato

Recording data

5. Page A0000-1 is intended for institute or project specific information, rules and/or guidelines.
6. Page A0000-4 to 8 are set aside for index for your experiments. The index list should include:
 - page number(s)
 - subject (title)
 - date

Føring av journal

7. Alle eksperimenter bør ha en:

- tittel (navn)
- dato
- metode(r)
- resultater
- konklusjon

Helst bør det være en kort beskrivelse av formålet med eksperimentet.

Signer og dater hver side.

Recording data

7. Every experiment shall have a:

- heading (name)
- date
- method(s)
- results
- conclusion

Ideally, it should include a short description of the intention of the experiment.

Sign and date every page.



Føring av journal

8. Navngi alle figurer og før beregninger med benevninger.

9. Løse ark skal:

- festes
- signeres
- dateres

Signer slik at signaturen dekker både journalside og det innlimte objekt.

10. Prøver som anvendes må dateres og merkes/nummeres slik at de er identifiserbare.

11. Data skal alltid referere utvetydig til materiale/prøve.

Recording data

8. Label all figures and calculations.

9. Graphs, figures, tables and loose descriptions shall be:

- Afixed
- Signed
- Dated

Sign the affixed page ensuring that the signature extends over the affixed elements as well as the journal page itself.

10. Samples that are used must be dated and labelled to allow for later identification.

11. Always link data to the appropriate sample.



Føring av journal

12. Metoden beskrives nøyaktig. Inkluder: relevante miljøfaktorer utstyr, materiale osv.
 - Er en SOP (Standard Operating Procedure) tilgjengelig kan man enkelt vise til denne med SOP-nummer og revisjonsnummer.
 - Hvis ikke må en fullstendig metodebeskrivelse inkluderes.
 - Beskriv alle avvik fra skriftlig prosedyre.
13. Laborariejournalen skal inkludere all relevant informasjon og referanse til tilleggsinformasjon, som:
 - URL
 - database filer
 - PC filer
 - etc.

Føring av journal

14. Hold journalen oppdatert. Denne skal også kunne brukes av dine samarbeidspartnere og veiledere.

Recording data

12. Describe the method and materials in the greatest possible detail. Include all relevant conditions, equipment used, environmental conditions, samples used, etc.
 - If a Standard Operating Procedure (SOP) is used simply refer to SOP number and revision number.
 - If not, a full record of the method should be described.
 - Comment any deviation from recorded procedure.
13. The journal shall contain all relevant information including references to sources of supplementary information, such as:
 - links (URLs)
 - references to databases
 - computer files
 - etc.

Recording data

14. Keep the journal up-to-date to ensure that everything is recorded in full detail, and serve as an updated source for your co-workers and supervisor.