

Terms of use of laboratory Geochemistry of the third floor

- Rules for Occupational Health and Safety
- Terms of Use
- Operating Principles

Responsibles :

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PREAMBLE

The charter includes a description of the basic principles of operation of the laboratory needed to work in optimal conditions. Provisions to ensure the safety of all and those essential to the achievement of consistent scientific studies (cleanliness, cohabitation) are described more specifically.

After reading this permanent charter, students, interns and post- doctoral students must go to responsible to sign an undertaking to respect and enforce the provisions it contains. This commitment is a prerequisite for use of the facilities (laboratories and measuring devices) . Those responsible are responsible for ensuring compliance with the provisions of this charter.

In case of breach of the rules of hygiene and safety detailed in this charter, the user will be prohibited after consulting the laboratory scientist.
Upon arrival students, interns, post-docs and visitors (in the event that they have to work in the laboratory) must be submitted to Sylvain Campillo and Sarah Bureau (or Alexandra Gourlan) who will give them a copy of this charter.

Students and post-doctoral trainees must also be submitted to the secretariat to enable them ISTerre recording and transmission of other necessary information.
Caution ! : A good internal control provision must be completed and returned to Sylvain Campillo or Sarah Bureau.

This paper allows you to start analysis when signed and returned to the responsible.

General Rules of Use of the clean room

1. Overview laboratories

The labs are clean environments (clean rooms) . Be sure to be as clean as possible to not "pollute" these rooms.

1.1. Weighing room

This room is dedicated:

1. A weighing of the natural samples analyzed
2. Parr bomb attacks:
The rocks are attacked by bomb in the oven for an attack if high pressure and temperature ($T = 140^{\circ}C$, no more !).
3. Storage in the refrigerator , standards, spikes and other chemical .
4. A titration of acids
5. Storage of concentrates in the closet entry acids (storage room)

1.2. traces room

This room is used for the preparation and processing of samples for the analysis of major and trace elements. It is equipped with glove boxes (= own space) in which there are hot plates for attack (acid) in natural samples Teflon vessels (Savillex) .

Acids are distilled in this room. The distillation of the acids is reserved to responsible of the laboratory.

This room also contains the containers for temporary storage of waste generated by different experiences. Finally, the Sorbonne (hood) in this room is for acid manipulations, or to mineralization (acid solutions) and acid washing equipment

1.3. room isotopy

The clean room is reserved for basic separations for isotopic analyzes . It is air-conditioned and requires that the door is closed for maintain a fixed temperature.

2 . Operating rules of rooms

2.1 Cleanliness and etiquette

The clean room Geochemistry Laboratory is a room where the presence of dust is controlled most of our resources.

The vast majority of the preparations we are making in the laboratory is extremely sensitive to particles , hence the need to work in a clean environment. Preparations for the success of each, it is essential to maintain a state of maximum cleanliness.

The prime factors of pollution in a clean room , are people witch are in ! They lead dust from the outside, the movements they do, cause turbulence, raise particles finally flaking skin generates abundant particles that can pollute your samples. This is imperative that everyone follows the simple rules of use of the clean room to maintain the cleanliness of the place and ensure the success of each other. Clean everything you use to let place clean for the next user and to avoid accidents .

Input / output cleanroom :

- Leave your shoes at the entrance of the chamber .
- Do not store clothing from outside on hooks reserved for blouses.
- Dressing / undressing in the SAS (first chamber) and not in the rooms .
- Have a pair of gloves (two for manipulation of HF) .
- Put a charlotte if necessary (long hair , clean chemistry) .
- Glasses and masks are in the rooms chemistry.
- If someone is already in the clean room , ask if you can come working with him .
- The doors of the rooms and the entrance of the SAS can not be opened simultaneously .
- Do not remove the lock in socks because you bring the dust corridor in the chemistry lab .
- Remove the gown before leaving the chamber.
- Put your shoes out of the airlock !

In the Cleanroom :

- Do not shake or move without reason.
- Avoid storing on the benches any equipment you do not use .
- store the equipment and products to their own place.
- After use, or before, in case of doubt, always clean up the equipment used . Clean

the bench with alcohol after use .

- Avoid storing old samples.

-Remember that you are not the only user of the cleanroom.

**A golden rule for maintaining the cleanliness and the success of your preparations
" THINK CLEAN "**

In practice, you will find that you can save time by increasing considerably the chances of success of your preparations.

2.2 Health and safety

- obligatory Blouse throughout the chemistry laboratory.

- obligatory gloves and glasses when handling concentrated acid .

- Respect the views regarding the safety and use protocols devices that are arranged close to each device or will be explained by one of the responsible of the laboratory.

-Chemicals : Before starting your experience with a product chemical (not usually used in the laboratory) , you must make a study Toxicity of the product to know the risks associated with handling .



explosive
ignitable
oxidizing
gas under pressure
corrosive
toxic
toxic, irritant
carcinogenic, teratogenic
hazardous to the aquatic
environment

This study will be submitted to the head of the study (internship or thesis) and one of responsible geochemistry laboratory to assess the feasibility of experiments .

Experiments using these toxic chemicals are not start before validation by a responsible laboratory. For that, plugs Toxicological products are available in the AP office or on the SAS door. It is also possible to supplement existing documentation requesting from

the Campus Safety Engineer (Mr. Lacroix - 0-04.76.51.42.69 - Jean-Luc.Lacroix @ univ-grenoble-alpes.fr) or suppliers , Material Safety Data Sheets complementary.

- Big cans are available in the room "Traces" to eliminate your waste (acids).
 - In case of accident consult panels instructions found on the doors geochemistry laboratory . In case of accident , call for 0-15 on any phone or 112. In case of fire call 0-18 from any phone
 - A shower is available at the entrance to the laboratory (in the SAS) in case of accident(splashing acid, ...) and an eye rinse is in the room "Traces" .
 - 3 x CO₂ extinguishers are available in cleanroom laboratory (Room "Traces" and room "Isotopy ") : one is located at the entrance to the clean room "Isotopic " , on the right behind the door and the other to the entry of the clean room " Traces "on the left side of the eye wash , and finally the last one is near the sink in the " weighing room ." A fourth extinguishers is located at the entrance to the laboratory on the outer wall. Other extinguishers are located in the corridors of the floor: water spray extinguisher in each "wing" and a CO₂ fire extinguisher input Upstairs geochemistry.
- For a fire basket, paper ... you must use extinguisher sprayed water. If the fire is close to a computer, or other electronic devices , it is necessary use CO₂ extinguishers .

2.3 Storage Hardware

· Samples

- Labeling: For convenient storage of samples in the fridge or room storage, you must write clearly on all your bottles, tubes of tube racks , boxes , etc. . your name (or initials) , date , content (or name of the sample and concentration for solutions prepared) . Any sample not or bad labelled will be discarded without notice.
- During your stay, drawers and closet shelves will be made available in the chemistry laboratory to store your bottles and other samples.
- At the end of your stay your scientific officer must ensure that the spaces available above are completely emptied by you. For that, you need empty and wash (or discard) all your bottles of preparation, select your samples with your Chief Scientist to keep only those that are essential in storage room.

This storage is a prerequisite to the validation by your scientist manager for your internships. The ultimate responsibility rests with storage scientist.

· Chemicals :

All chemicals , except solutions , must be stored under hoods . For reasons of safety and accessibility , no chemicals should be stored in drawers or closets.

- **Sorbonne extraction :**

A fume hood is available in the room "Traces" : it must be used for all experience requiring extraction and handling of toxic chemicals . Do not leave filled with acid solution in non- safe containers closed under fume hood which is reserved for storage and washing , and that, for reasons of hygiene (acid vapors) and safety (risk of burns, wounds) .

- **Glove boxes :**

The glove box also require a complete storage after each experience . The hot plate on which you handle must be cleaned with pure water and the absorbent paper (no sponge). The glove boxes should be regularly cleaned with absorbent paper.

2.4 Controls

For ease of management , ordering chemicals and small equipment are made as soon as possible. It is essential to the functioning of laboratory report to the manager while depletion of chemicals (alcohol , acids, ...) and other materials (bottles, gloves ...) and the note on the whiteboard in the lock the entrance to the laboratory before depletion is effective!

Report a responsible laboratory when the stock decreases.

The catalogs are available in the office No. 314.

Before ordering a product make sure it is not already in the laboratory.

If you take delivery of a parcel in the absence of an official of the laboratory, drop it in the office No. 314 or in the airlock entrance to the laboratory.

3 . Moral commitment : Safety of geochemistry laboratory

Responsible for the laboratory: Alexandra Gourlan / Sylvain Campillo / Sarah Bureau

General

- Have respect for highly corrosive acids.

Hydrofluoric acid HF is particularly insidious because it not picks . His attacks are very painful after a few hours and usually VERY dangerous . He attacks the glass quickly. For handling it, you have to wear double gloves ! Less dangerous , hydrochloric acid HCl irritate the skin and lungs, nitric acid HNO₃ yellow skin , usually without sequelae , and destroyed clothing. Water regia (HCl + HNO₃) and perchloric acid (HClO₄) and to a lesser extent with sulfuric acid (H₂SO₄) gnaw the skin very quickly.

- The aqua regia (HCl + HNO₃) liberates highly carcinogenic gas free radicals. Do

not use it ! (H_3BO_3 also)

- When handling concentrated acids and even dangerous low acid concentrations , put gloves and glasses. One of our highly experienced colleagues at the University of Tucson lost an eye for neglecting this rule.
- Similarly, wearing a blouse, it will avoid holes in your new sweater.
- A glove is an imperfect protection that gives a false sense of security because it is often pierced by nails. Wash your hands regularly , but also leaving the laboratory.
- If you have any doubt about a liquid contact, rinse immediately with plenty of water .
- Familiarize yourself without waiting for the accident, the location and mode of operation of products safety eye wash, glucomate of calcium gel to neutralize the effects of HF, shower.
- Do not take the bottles of acid by the cap , someone may have forgotten to tighten .
- A badly screw cap on a bottle can splash the contents falling out with colleagues or by yourself.
- Do not fill the wash bottles above the line , they become incontinent .
- All liquids, acids or water spilled Bench should be wiped immediately. The person who working next to you , or near you, probably can't see it or take the liquid for water.
- Check the electrical connections (rust) and report anomalies.
- If you make a mishandling whatsoever , do not hide it , it would be worse . Tell a competent person.

Wash

- Recycle acids in bottles provided for this purpose . Do not pour down the drain (under running water) only solutions (HCl and HNO_3 only) whose acid concentration is less than 0.5N .
- Siphon acid wash under the hood and not on the bench . This will prevent damage on your lungs and this will allow the lab to stay longer presentable .

Evaporation

- The softening temperature of the plate is very different for glass ($> 600^\circ \text{C}$), the Teflon (200°C) and polyethylene (80°C) . Therefore, never put plastic containers on the plate heating .
- The perchloric acid is a potential explosive, especially at high temperatures. Do not forget when you evaporated it on a hot plate in a teflon beaker ($T < 200^\circ \text{C}$) ..

Often tap the bottom on the plate. It will be faster and safer than raising the temperature . Minimize the amount of this acid. Never use directly on a sample , but diluted with another one, often HNO_3 , at the beginning of acid attack.

Titration

- You never aspirate (acids and bases) with the mouth ! Use propipette .

Working hours

Students (master and short stays) are not allowed to manipulate outside the opening hours of the laboratory (8.30 - 18.00) or on weekends , except where a permanent present to supervise .

WHATEVER YOUR EXPERIENCE , DO NOT PUT IN OVER SAFETY RULES :
ALSO THIS DECISION CONCERNING THE SAFETY OF OTHERS. TRUST AND
HABITS ARE ENEMIES OF THE FIRST SECURITY ;
ANTICIPATE , ANTICIPATE , ANTICIPATE !

Emergency numbers for the department of Isère:

SAMU 0-15 or 112

FIRE 0-18 or 112

POLICE or 0-17 112

Poison control center 0-04 72 11 69 11

Pharmacy guard 0-04 76 63 42 55

SOS Doctor 0-04 76 63 08 08

Note: This form must be photocopied, signed and returned to one of the officials, before commencement of experiments in cleanroom laboratory .

Keep the photocopy .

Date:

Name:

First Name:

Signature: