Rules for the use of ISTerre's ICP-MS and ICP-OES analysis room

Responsibles :

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PREAMBLE

The purpose of this user charter is to guarantee the safety, integrity of the analyses and maintenance of the equipment in the analysis room containing an Agilent ICP-MS 7900 (Inductively Coupled Plasma Mass Spectrometry) and an Agilent ICP-OES 5800 (Inductively Coupled Plasma Optical Emission Spectroscopy).

The room must be considered as a clean room (samples prepared upstream in a clean chemistry room), which implies strict standards of cleanliness and sample handling (see the charter for use of the geochemistry clean room

This charter is designed to ensure a safe and efficient working environment in the analysis room containing the ICP-MS and ICP-OES. Compliance with these rules is essential to guarantee accurate and reliable analysis results and to protect the health and safety of all users.

Any deviation from the rules of this charter must be reported immediately to the person in charge of the analysis room.

Objectives :

- Ensure a clean and safe working environment for users.
- Maintain the integrity of samples and analysis results.
- Maintain the performance and longevity of ICP-MS and ICP-OES equipment.
- Minimise the risk of cross-contamination.

After reading this document, permanent staff, students, trainees and post-doctoral fellows must sign the "moral contract" and hand it in to a manager. This commitment is a sine qua non condition for using the facilities (laboratories and measuring equipment). Managers are responsible for ensuring that the provisions of this charter are respected.

Failure to comply with the health and safety rules set out in this charter may result in the user being banned from the laboratory after consultation with the managers.

Please note! A service order form must be completed and returned to Sylvain Campillo and Sabine Sentenac before the analyses begin.

1. Access to the ICP Analysis Room

1. Restricted access:

    - Only authorised users who have received appropriate training in the use of the room, ICP-MS and ICP-OES may access the analysis room.
    - A register of external users must be kept up to date, with entry and exit times for each user.
    - The room's scales are not freely accessible. Ask for authorisation before use.
    - No samples in powder form may enter the room without prior authorisation from those in charge (cross-pollution, analysis in progress, etc.).
    - Access to the refrigerator for certified standards is restricted. Ask those in charge.

2. Compulsory training:

    - ll users must undergo initial training in the use of equipment, safety procedures and cleanliness protocols.
    - Annual refresher training may be required.

3. Clothing and Personal Protective Equipment (PPE) :

    - Laboratory coats, gloves, goggles and clogs must be worn.
    - Long hair must be tied back, and jewellery (hands and wrists) must be removed before entering the room.

4. ICP room consumables:
    - The consumables used in this room (gloves, paper towels, ethanol, etc.) are those used in the cleanroom. They are purchased on specific credits. Make sure you pay your cleanroom access fee (different from the 1st floor chemistry room) to use these consumables..

5. Preparation of standards and samples

    - For all preparations outside the cleanroom and ICP room, a kit containing all the materials, standards and distilled acids required for ICP-OES and ICP-MS analyses will be supplied by the engineers in charge.

2. Rules for Cleanliness and Handling of Samples

1. Hygiene :

    - Wash your hands before entering the analysis room.
    - Do not eat, drink, vapourise or chew gum in the analysis room.

2. Sample handling:

    - Use clean pipettes, vials and containers to handle and store samples.
    - Samples should be prepared in a fume hood or designated area to minimise contamination.
    - Clearly label all samples with the necessary information (sample identification, date, user)..

3. Sample storage :

    - Samples must be stored in hermetically sealed containers to prevent leakage and contamination.
    - Samples should be stored outside the room in designated refrigerators or cabinets, according to specific storage protocols.
    - Do not place bags or boxes that have been lying around on the floor on the benches.
    - Do not bring in pencils (or wood pencils) or laboratory notebooks written with them (carbon and metal pollution).

3. Use of equipment (ICP-MS et ICP-OES)

1. Equipment preparation:
    - No use of equipment without prior validation by the persons in charge of the equipment (matrix, loading, dilution, calibration, etc.).
    - Check that the instrument is in good working order before use..
    - Perform a visual check of the instrument to identify any anomalies before start-up.
    - Use only dedicated consumables (tubes, pumps, etc.)
2. Use of the Equipment :
    - Strictly follow the procedures for switching on, using and switching off (or putting to standby) the instruments defined in the MOPs and explained by those in charge.
    - Check operation and results until the end of the first calibration. During the analysis, check the correct operation of the instrument, the quality of your results and the integrity of the machine.

- You will be billed for any negligence or misinformation concerning your samples that leads to breakdown or breakage.

3. Cleaning and Maintenance:
   - Clean work surfaces and instruments after each use.
   - Put equipment away and collect samples. Don't leave anything lying around to clutter up the benches.
   - Document all anomalies and incidents in the instrument's laboratory notebook.
   - Routine maintenance (cleaning the torch, changing consumables) is carried out by laboratory managers according to an established schedule. The frequency of maintenance may vary according to the matrices of your samples and your comments in the laboratory notebook..

4. Waste Management

1. Waste collection:
   - Liquid samples must be collected immediately after analysis. No storage in the room.
   - Solid waste (gloves, sopalins, tubes) must be disposed of in the appropriate garbage cans.
2. Waste disposal:
   - Chemical waste must be disposed of in accordance with local regulations and internal waste management protocols defined in laboratory user charters.
   - Waste containers must be emptied regularly and must not exceed their capacity.

5. Security

1. Emergencies :
   - In the event of a chemical spill or accident, immediately alert the prevention assistants and those in charge of the room, then follow the emergency procedures defined in the geochemistry laboratory user charters.
   - Emergency numbers are posted on the SAS door
2. Safety equipment:
   - Please note that there is no safety shower or eyewash station in this room. Solvents used for analysis in this room must not be concentrated (HCl and HNO3 2%...)
   - Fire extinguishers must be easily accessible and regularly checked.
   - An O2 detector is installed in the room to monitor potential leaks of argon or other gases. Check that it is working properly. In the event of an alarm, evacuate the room immediately and notify the prevention assistants and room managers.

6. Documentation and traceability

1. Sample follow-up:
   - Before each analysis, complete the "request for service" document in detail, including all samples to be analyzed, sample details (matrix, concentrations, etc.), analysis date and users responsible.
2. Instrument laboratory notebook:
   - Record all instrument operations, including date, time, user, analysis parameters, incidents and observations

3. Analysis reports :
   - Analytical results must be documented and verified before release. All reports must include analysis conditions, DL/QL values and conclusions..

7. Respect and Discipline

1. Behavior :
   - Respect established rules and protocols. Failure to do so may result in suspension of access to the analysis room.
   - Treat all colleagues with respect and courtesy.
   - Respect your colleagues by collecting your samples and leaving the room cleaner than you found it.
   - Don't leave anything lying around. The ICP room is not a storage room
2. Feedback and Improvements:

Users are encouraged to provide comments and suggestions for improving analysis room procedures and safety.

Emergency numbers for the Isère department:

European emergency number	112
SAMU / EMERGENCY MEDICAL SERVICE	15
Police	17
Firefighters	18
Emergency number for the deaf and hearing-impaired	114
Poison control center	0-04 72 11 69 11

SOS Doctor 0-04 38 70 17 01

On-call pharmacy 0-04 76 63 42 55

8. Valorization of results

- **Papers**

- **If major participation by technical staff (**large number of samples handled: preparation, analysis and/or field missions and/or writing/proofreading of valuations): you must involve technical staff as co-authors..

- **If minor participation by technical staff** : you should thank them by name in the acknowledgements.

- **Without technical staff participation** : you must thank the platform as follows:

« *Sample preparation and /or Chemical analysis and/or Sample Characterization (cite the type of analysis or other: ICP-OES, ICP-MS …) have been performed at the geochemistry-mineralogy platform of ISTerre (Grenoble, France)* ».

The Acknowledgements section must always contain the phrase:

« *The geochemistry-mineralogy platform of ISTerre (Grenoble, France)* is partially funded by a grant from Labex OSUG@2020 (investissements d'avenir, ANR10-LABX56").

- **Conferences (oral et poster)**

The rules for associating technical staff and platform thanks are the same as those described above..

ATTESTATION

I, the undersigned, ……present at the ISTERRE laboratory and using room 010 for the period from …… / …… / …… to …… / …… / …… in the capacity of ……, acknowledge having read the charter for the use of room 010 of the ICPs of the ISTERRE laboratory and its safety instructions and undertake to comply with them. I also undertake to provide all information relating to my samples and the solvents used to dissolve them. Any damage to machines or consumables (torch, nebulizer, etc.) will be billed to me at a later date. I undertake to provide a duly completed service request form before starting an analysis. I undertake to fill in the laboratory notebooks and attendance sheets correctly and systematically (for external staff). Access badges must be left in the room every evening. For safety reasons, lone working is forbidden. Working on weekends and public holidays is not permitted.

Working conditions in the hall require: the wearing of a clean smock, safety glasses, gloves and clean clogs specific to the hall (personal shoes are forbidden). No dusty or fibrous clothing.

Phone : ……

e-mail : ……

Person to contact in case of accident:……

Made at ……, date : ……

Signature :

Note: This attestation (page 8) must be signed electronically and returned to one of our managers before the beginning of analysis in this room.