

Department of Chemistry, University of Michigan

Signup Rules and Guidelines for The Use of The Departmental NMR Spectrometers

July 7, 2014

General Safety Guidelines

1. No food or drinks are allowed in the lab.
2. No radioactive, or highly dangerous biological or chemical samples are allowed in the lab.
3. Working with chemicals or preparing samples on the computer desks is not allowed. Use the fume hood for that purpose.
4. Gloves are not allowed when typing on the keyboards or using the spectrometers. Gloves can be used when working at the fume hood.
5. Metallic objects, whether small or large may constitute a hazard to the instrument and to the user and are not allowed near the magnets.
6. **Samples broken outside the magnet should be thoroughly cleaned up and reported to the staff.** This includes everything that came into contact with the sample: the working surface, desk, depth gauge, spinner, etc. Never insert the sample tube into the spinner above the keyboard (or even above the desk); cleaning it will be very difficult in case the tube breaks, and all users will likely get contaminated fingers.
7. **Samples broken inside the magnet should be reported to the staff immediately, and a note stating that the instrument is out of order should be visibly posted on the computer keyboard.**
8. Superconducting magnets may occasionally quench for a variety of reasons. During a quench, the liquid helium inside the magnet's cryostat is boiled off very rapidly, resulting in a fast and massive release of helium gas along with a loud sound. Although helium is not toxic, it will reduce the oxygen concentration in the lab's atmosphere which may lead to disorientation, loss of conscience and suffocation. If you observe a large exhaust of white gas coming out from one of the magnets, or a large condensation cloud at the lab's ceiling, vacate the lab immediately and notify the staff. Wait at least one hour to re-enter the lab. The Facility is equipped with oxygen sensors: if the alarm is triggered, exit the lab immediately.

Usage Rules

1. The departmental NMR center is a multi-user facility; and all users must be considerate of the sign-up rules in order for everyone to be accommodated. **Recurrent violation of the rules by any individual will not be tolerated and could result in loss of NMR privileges.**
2. Use of the spectrometers is restricted to U of M's faculty, graduate students, postdoctoral fellows and other authorized persons after successful training and approval. Undergraduates engaged in long term independent research projects under faculty direction will be trained on these instruments upon their supervisor's request.
3. Only persons who have received or are receiving training, or are otherwise authorized are allowed in the lab. Users with pacemakers or other medical implants are not allowed near the magnets and must consult with the staff for approval.
4. Haphazard experimentation with the NMR hardware will not be tolerated under ANY circumstance; violation of this policy will result in immediate and permanent loss of NMR privileges. Users are not authorized to change or tune probes or modify hardware except as instructed during training or after proper authorization. If there is trouble with any of the NMR instruments, ask the NMR staff for help. If the NMR staff is not available, consult the "Common Problems and Solutions" handout available on the

lab's web site or wait for help before proceeding. Report all hardware or software malfunctions as soon as possible.

5. It is the responsibility of all users to learn the capabilities of each instrument to avoid damage and maximize efficient use of the NMR hardware. For example, the allowed temperature range is determined by each probe's design; exceeding it may result in permanent damage. Instrument descriptions and capabilities are posted on the lab's web site.
6. **Samples broken inside or outside the magnet should be thoroughly cleaned up and reported to the staff immediately.** If this happens after business hours, send an email to the staff. If the sample was broken inside the magnet or if an empty spinner was dropped in the magnet preventing its safe use, leave a note over the keyboard so no other user will attempt to use the spectrometer.
7. All users are required to remain logged in during the full duration of their session and are responsible to return the instrument to normal operation before they finish. That includes, retrieving the sample from the magnet, returning the magnet to room temperature and logging out of the account at the end.
8. Any given user can only reserve time for him/her-self; that is, a single user cannot use the time reserved under the name of a different user except when that user didn't show up within the first 10 minutes of his appointment. Additionally, a user can only log in using his/her own account; logging in under another user's account is not allowed.
9. **Only one instrument can be used by the same user at any given time.**
10. Except for our walk-up instrument, time in our instruments is divided in two types with different sign up rules as described below. *Prime time* is 9:00 am to 9:00 pm Monday to Friday, and *regular time* is any other time. **Users may not sign up for contiguous time slots if they span a prime time boundary** (9 am or 9 pm). In other words, joining prime time and regular time is not allowed. For example, a user may not sign up for both 8 pm to 9 pm and for 9 pm to 10 pm (9 pm boundary is spanned); or from 9 pm to 9 am and then for 9 am to 10 am (9 am boundary is spanned). The only exception is if you have already signed up for the time before the boundary and it is currently less than one hour before this boundary, then you can make an adjacent reservation and continue using the instrument through the boundary. For example, if you reserved from 10 pm to 9 am, and it is now 8:10 am and no other person has reserved the instrument after 9 am, then you are allowed to enter a contiguous reservation starting at 9 am. The purpose of this exception is to maximize use of the instruments that would otherwise go unused.
11. **Reservations should be canceled as soon as possible when they are no longer needed.**
12. **Reservations should be truncated when the remaining time of a reservation currently being used is no longer needed.** This will make the remaining time available to other users.
13. **A user will forfeit his/hers scheduled time if he/she is more than 10 minutes late** according to the clock in the NMR room. *But please, if you don't need your scheduled time or a portion of it, cancel or truncate your reservation so the time is made available to other users.* **A user who repeatedly abandons large reservations will be banned from using the spectrometers.**
14. All users must use the remote stations for data analysis. Of course, you can use a spectrometer for data analysis if you are currently using it for acquisition. There is no charge for use of the workstations. All research groups are encouraged to purchase a Linux workstation, or Macintosh OS X 10.3 computer. The department has a site license for the VnmrJ NMR software. There is also a workstation available with Mestrelab Research's MestReNova for processing of NMR data.
15. Users who need more than the permitted time during peak hours, or need the assistance of the NMR staff to perform non-routine experiments, can schedule longer time blocks during the day if approved and scheduled by the NMR staff.

Signup rules (July 2, 2014)

Tin (Inova 500), Gallium (400):

- a) Monday to Friday from 9 am to 9 pm: 10 minutes time blocks up to a maximum of 1 hour per user per day.
- b) Monday to Friday from 9 pm to 9 am: 10 minutes time blocks and unlimited time.
- c) Saturday and Sunday: 10 minutes time blocks and unlimited time; 24 hour advance reservation for blocks longer than 5 hr.

Tellurium (500), Ytterbium (700):

- a) Monday to Friday from 9 am to 9 pm: 10 minutes time blocks up to a maximum of 5 hours per user per day.
- b) Monday to Friday from 9 pm to 9 am: 10 minutes time blocks and unlimited time.
- c) Saturday and Sunday: 10 minutes time blocks and unlimited time; 24 hour advance reservation for blocks longer than 5 hr.

Cobalt (400):

- a) This spectrometer is walk-on (no reservation is necessary), limited to 10 minutes time blocks. Use of additional contiguous time beyond 10 minutes is permitted if there are no users waiting for the machine. When other users are waiting, you should finish your work within your allowed time and notify them when you are done.

Zirconium (Inova 400):

- a) This spectrometer is located in room 2407 and is used for teaching during the fall and winter terms and normally not available for research. During the summer (June through August), it is made available for research under rules posted when its access is opened. The rules are usually similar to those of the Inova 500.