

**MATERIALS RESEARCH LABORATORY
X-RAY DIFFRACTION SHARED EXPERIMENTAL FACILITY**

**RULES AND REGULATIONS
for working in the MRL X-Ray Diffraction SEF**

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<http://prism.mit.edu/xray>

IN THE EVENT OF AN EMERGENCY OR SUSPECTED EXPOSURE TO X-RAYS FROM EQUIPMENT IN THIS LABORATORY, DO THE FOLLOWING:

Notify the supervisor of this laboratory:

Charles Settens
845-430-2584
OFFICE: 13-4009A

During Business Hours, contact EHS and ask to speak to a member of the Radiation Protection Office:

(617) 452-3477

During Evenings, Weekends, and Holidays, contact campus police:

x100
(617) 253-1212
They will notify the Radiation Protection Office and provide assistance.

The X-Ray Diffraction facility has many users. In order for all users and the costly equipment to coexist peaceably, certain rules must be imposed. Some are imposed to ensure your safety, some to maintain the equipment in good working order, and others to facilitate civility and good will among the users.

In order to work in the X-Ray SEF, you must read and sign these rules, indicating that you agree abide by them. Failure to follow these rules may result in revocation of your access to the XRD SEF.

Remember, you are not just responsible for your own safety; you are also responsible for the safety of those around you.

RULES AND REGULATIONS in the X-RAY SEF

1. Always follow all laboratory safety and chemical hygiene rules. Be sure you are familiar with both the MIT and MRL chemical hygiene plans.

Always follow the procedures outlined in the official SOPs (available at <http://prism.mit.edu/xray/education/downloads.html>, on each data collection computer, and in the red binders by each instrument).

2. Never defeat or bypass any safety interlock on the X-ray diffractometers. Violation of this rule will result in loss of access to the X-Ray SEF and other corrective measures.
3. No food or beverages are permitted in the laboratory.
4. Any hazardous situation noticed by a user (such as a water leak) must be reported at once to SEF staff or MIT facilities (x3-4948). Remember that staff contact information, including home phone numbers, are posted on the lab door in case of an emergency after hours.

5. “STOP WORK” ORDERS

If a person witnesses another individual performing actions that may compromise their safety and/or the safety of others, then that person should tell them to “Stop Work”. The individual should cease all activity and listen to the concerns expressed. The two should discuss and agree on a safe procedure for the work to continue. If an agreement cannot be reached, then the two must contact the nearest supervisor and discuss the issue with them.

- Any person may issue a “Stop Work” Order to any one else without fear of repercussion.
 - If receiving a “Stop Work” Order, you must immediately cease all work and listen, with respect and due attention, to the concerns of the person issuing the order.
 - Work may not continue until the concerns of the “Stop Work” Order have been resolved.
 - The “nearest supervisor” may be the lab supervisor (Charles Settens), the building safety coordinator (Lars Llorente), an EHS representative or MRL administrator.
6. In order to minimize your potential for exposure to radiation, spend as little time in the X-ray lab as possible.
 - Do not loiter in the X-ray lab while your data are being collected.
 - Analyze your data using the computers in room 13-4041, not the computers in the X-ray lab.
 - You must return to the X-ray lab as soon as your measurement is complete in order to turn the instrument off and to retrieve your sample.
 7. Check the condition of the X-ray diffractometer before you start work.
 - Read all signs posted on the instruments, as they may include instructions and/or notices about changes in the instrument.
 - Make sure that all X-ray shielding is in place.
 - Never remove any X-ray shielding, except as instructed by the SOP.
 - Check that the X-ray safety shutter is closed.
 - Never open the enclosure door when you know or suspect that the shutter may be open.
 8. If you discover that an instrument is not working properly:
 - Report the problem to Charles Settens in person, via voice mail (845-430-2584), or via e-mail (settens@mit.edu).
 - Log the problem in Coral (see <http://prism.mit.edu/xray/coral.html> for instructions).
 - Post a sign on the instrument so that other users are aware that there is a problem.

- Do not attempt to repair the instrument yourself.
 - Never remove or handle the X-ray source (sealed tube or rotating anode). Be aware that the X-ray source contains Be windows. Never touch any part of an exposed X-ray source.
 - Never tamper with or handle the X-ray safety shutter.
 - Never remove radiation shielding unless instructed to do so by the official SOP.
 - If the instrument is broken by negligence or abuse and the problem is not reported, then it will be assumed that the last person that used the instrument but did not report the problem is responsible and appropriate action will be taken.
 - If you accidentally break the instrument and report the problem in a timely manner, then there will be no repercussions (either financial or administrative).
9. Your training allows you to work in the lab from 9 am until 5 pm during normal business days.
- You are allowed to be in the lab after hours if you are accompanied at all times by a user with after-hour privileges.
 - After you have demonstrated responsible operation of instrumentation for at least 1 month, you may request after-hours privileges from Charles Settens.
10. The X-ray lab is not equipped for safe chemical processing. No chemical work beyond loading the sample holder should be done in the X-ray lab.
- Take all of your samples with you when you leave.
 - Do not use the sink or wastebaskets to dispose of your samples.
 - The X-ray lab does not have a hazardous waste disposal area. All samples, chemicals, and hazardous waste (including used kimwipes, weigh paper, and other ancillary materials) must be collected in a sealed bag and safely transported back to your lab for proper disposal.
 - No acutely toxic material may be brought into the lab without notifying SEF staff.
 - If your sample is acutely toxic, then additional arrangement for safety must be made before you begin your experiment. You must meet with SEF staff to develop a safe procedure for handling the sample in the instrument, preventing contamination of the instrument, cleaning up a spill, and responding to any other emergency.
 - You must provide SEF staff with MSDS for your material.
 - You must bring all spill control materials and protective clothing required for working with your hazardous material.
 - If there is spill, you must inform SEF staff and EHS as described in the MIT chemical hygiene plan (CHP). You must clean all affected equipment, furniture, and floor according to the procedures developed with staff and as described in the MIT CHP.
 - When wearing gloves to work with any hazardous material, you must take those gloves off before typing at a computer keyboard or touch the instrument to open doors and operate controls (knobs, buttons, etc).
11. If you spill your sample you must clean it up immediately. If it is hazardous, inform SEF staff and EHS as described in the MIT CHP. If you cannot clean the spill (for example, any spill inside the radiation protective shielding in the Rigaku), then report the spill to Charles Settens. Specify what material you spilled and any safety precautions necessary when cleaning it up and disposing of it. If your sample is hazardous, put a sign on the instrument telling other users not to use the instrument until the spill is cleaned up.

12. Solvent bottles should be returned to their secondary containment on the sink.
13. The equipment in this facility may be used only by those persons that have been given instruction and authorization by Charles Settens and your account has been activated in the Coral system.
14. Should an emergency alarm sound, you must evacuate the building immediately.
 - If the alarm ends during business hours, return to the lab to clean up your sample.
 - If the alarm ends after hours, then notify Charles Settens where your sample is and what precautions must be taken in handling it. SEF Staff will attempt to secure your sample.
 - You may not use any device (eg headphones) that would prevent you from hearing an alarm.
15. Any injury sustained in the X-ray lab must be reported at once to SEF staff or MRL Administration.
16. You are solely responsible for the preservation and security of data collected in the X-ray lab. We do not guarantee that your data will be backed up and safe from deletion, nor do we guarantee that others cannot access and copy your data.
17. You may reserve instrument time using the Coral system
 - You may reserved instrument time 14 days in advance.
 - Within the 14 day window, you may reserve:
 - 15 hours of prime time on the Rigaku SmartLab and PANalytical
 - 30 hours of prime time on all other instruments.
 - Repeated failure to show up for reserved instrument time will be reported to the MRL administration, who may pursue corrective action.
 - If you want to cancel a reservation, you must do so 12 hours before the start of your time slot in order to avoid a penalty. Notify SEF staff if circumstances force you to cancel a reservation at the last minute.
 - If a person is 15 minutes late for their reserved time slot, they forfeit that entire reservation.
 - You must log your instrument use time by engaging Coral at the beginning of your measurement and disengaging Coral when done.
18. Updates to the official Rules and Regulations will be posted in the laboratory. You are expected to comply with the rules as posted.

Name: _____
Please print

MIT ID #: _____

Email: _____

I have received a copy of the Rules and Regulations for using the X-Ray Diffraction Shared Experimental Facility (Revised 26 April 2019). They have been explained to me, I understand them, I have been given an opportunity to ask questions, and agree to abide by these rules.

Signature: _____

Date: