

## Surface Science Western: Health and Safety Procedure

Anyone working in the laboratory at Surface Science Western (SSW), including research personnel and students, must read these instructions carefully and sign the document. For specific Health and Safety policies please read Western's *Laboratory Health and Safety Manual for General Laboratory Practices Manual*, which can be found using the following link:

[https://www.uwo.ca/hr/form\\_doc/health\\_safety/doc/manuals/lab\\_safety\\_manual.pdf](https://www.uwo.ca/hr/form_doc/health_safety/doc/manuals/lab_safety_manual.pdf)

### Emergency number

- In the case of an emergency, call **911** from any cellphone or local office phone.
- Let the emergency responders know what the emergency is, how many people are involved, what building you are in (999 Collip Circle, Convergence Centre), and what room the emergency is in.

### General Health and Safety Instructions for working in the laboratory

- You should be covered from shoulder to toe when at SSW, **NO** open-toed shoes, exposed ankles, shorts, mesh pants, or exposed stomach, or shoulders. Long hair (below the shoulders) should be tied up in a ponytail or equivalent. If you are not appropriately dressed for laboratory work at SSW then SSW staff will ask you to leave the laboratory to get the appropriate clothing to wear.
- All personnel must successfully complete, and keep up-to-date, with all required Health and Safety courses offered by Western University before working in the lab. Some instruments require extra safety training (e.g., Raman, XRD, Micro-CT); please check with SSW staff what instrument-specific safety training is required.
- Be familiar with the SDS for all the hazardous materials that you will work with before using the materials. Any personal protective equipment (PPE) specific to the procedure must be worn. You may need to bring your own safety protective equipment for certain specific operations.
- If handling hazardous chemicals, special training by an SSW staff member is needed on how to take care of a spill (working with hazardous chemicals cannot be done after hours). All spills, accidents, incidents, and exposures must be reported to the lab manager, Brad Kobe, and the Health and Safety officer Jonas Hedberg.
- If you are not sure whether the chemicals you are working with are hazardous or not, please contact SSW's Health and Safety Officer, Dr. Jonas Hedberg to receive appropriate guidelines. For radioactive materials, please contact Sridhar Ramamurthy.
- Lab coats must only be worn in the laboratories and may not be stored in the office spaces.
- No eating, drinking, or storage of food, is allowed in any of the laboratory spaces. There are ledges outside of the labs in the hallway to store any food or drink. Please do not bring backpacks that contain food or drinks into the laboratory spaces. Please dispose of food wrappers and/or beverage containers in the kitchen garbage, not in the lab garbage.
- Loading dock/elevator protocol – do not enter the service elevator if the alarm is sounding above the elevator door. Do not ride in the elevator with chemicals and/or liquid nitrogen.
- Unattended procedures/experiments should be kept at a minimum. An unattended procedure/experiment must be visited periodically, and a sign posted on the door of the lab space outlining the procedure/experiment with the name and phone number of a contact person. The sign must also indicate the date and time the procedure/experiment was commenced and when it is expected to be completed.

- See the separate section below for the procedures regarding working after hours and alone.
- Everyone is required to label any samples brought to SSW with the appropriate job number and a description of the sample. This also includes portions of samples being analysed (e.g., on EDX stubs). Any chemicals that are brought to the lab must also be labelled. Failure to do so will lead to the disposal of unattended samples.
- All researchers coming to SSW to use our facilities **must have completed the Radiation Safety Awareness Training or Radiation Safety Training**. Once completed, please send the training certificate to Sridhar Ramamurthy (radiation safety coordinator) for his signature and approval. Sridhar's email address is [sramamur@uwo.ca/](mailto:sramamur@uwo.ca)
- You **will not be able to access SSW's facilities until the completion of the radiation safety awareness training at the minimum**.
- If the yellow "Rayonnement – Danger – Radiation" is on the door of any lab, it means that radioactive samples are being analyzed in that room. This means that **you cannot enter the room unless you have completed the radiation safety training**. If this happens, please contact Jeff Henderson, Sridhar Ramamurthy, or any one of the SSW people who have completed the radiation safety training to guide you on the appropriate procedure for accessing the room and/or your samples.
- If the laser sign is on above the Raman room (LL06) door, do not enter unless you have Laser safety training through Western. Even if you have training, make sure to avert your eyes from the location of the Raman microscope/laser while it is in operation. Anyone who uses the room, for example for TGA analysis, must have the laser safety training from Western for class 3b and 4 lasers. Please send your laser safety training certificates to Jonas Hedberg and Rebecca Sarazen for SSW record keeping.
- You will need to wear a TLD badge and have completed Western's X-ray or radiation safety training to enter the X-ray laboratory (LL34 - XRD and micro-CT room). If you do not have a valid TLD badge, please see Sridhar Ramamurthy, Vahid Dehnavi, Brad Kobe, or Ivan Barker about using a visitor TLD badge available at SSW (on a temporary basis). Please contact the X-ray safety Coordinator (Sridhar Ramamurthy) about getting your own TLD badge if you are going to use XRD or micro-CT often. To obtain a TLD badge, you need to complete the X-ray safety training first. Please also send your radiation and/or X-ray safety training certificates to Sridhar Ramamurthy and Rebecca Sarazen for SSW record keeping.

### Sign in procedure

All visitors, including students coming into SSW, are required to sign in and sign out at the Main Office (LL31) when entering the laboratory for lab work, instrument work or to meet with an SSW staff member. This includes regular laboratory hours and after-hours. A signing logbook is in the main office. Additional sign-in procedures are available in the SSW-Laboratory Information Guidelines Document.

### Location of safety equipment and first aid

- The First Aid kit is mounted on the wall opposite the photocopier in the kitchen (LL29) (beside the front office). It is a white box, with a green sign that says "First Aid" on it.
- SSW staff members certified in First Aid: Vahid Dehnavi and Ivan Barker – if someone needs first aid, please alert these staff members **ASAP**.
- Safety showers are located in the Chemistry lab (LL10), Minerology lab (LL09) and the Research lab (LL13). Pull down on the handle to activate.

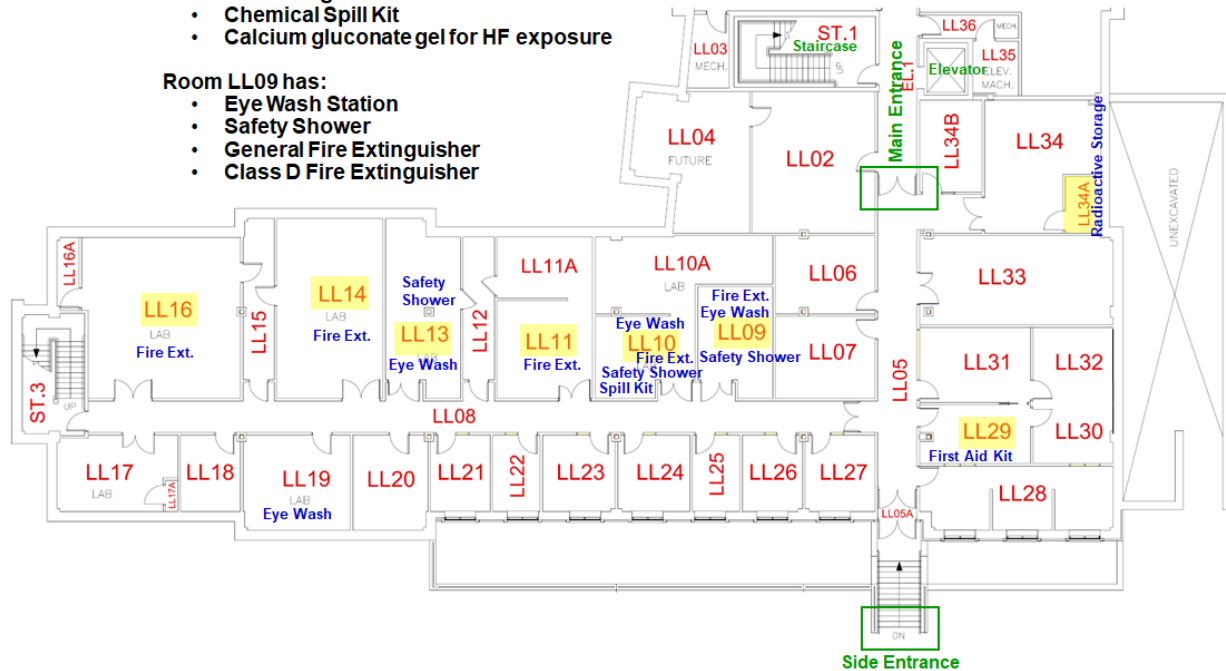
- Eye wash stations are in the Chemistry lab (LL10), Mineralogy lab (LL09), Research lab (LL13) and the sample preparation lab (LL19). Push forward while your eyes are directly in front of the nozzle.
- The fire extinguishers are mounted in the Mineralogy lab (LL09), Chemistry lab (LL10), FE-SEM lab (LL11), Research lab (LL13), XPS lab (LL14), SIMS lab (LL16), and at the entrance of the building on the main floor. A class D fire extinguisher is located in the Mineralogy lab (LL09). In case of a fire of any size, activate the building fire alarm system by pulling the nearest fire alarm pull station. If you are trained in using a fire extinguisher, try extinguishing the fire if it is smaller than the size of a basketball. Rebecca (Becky) Sarazen and Sridhar Ramamurthy are trained in the operation of the fire extinguishers.
- Location of the chemical spill kit: Chemistry lab (LL10).
- Location of calcium gluconate gel for HF acid exposure: Chemistry lab (LL10).
- Location of radioactive storage area: Micro-CT/XRD room (LL34A) – please note that only the Radiation Safety Coordinator (Sridhar Ramamurthy) and SSW personnel who have completed the radiation safety training are allowed to enter this room.
- To know where these rooms are located, please see the image below for the floor plan of our facility. All the rooms mentioned above are highlighted in yellow and the safety feature is indicated in blue font.

**Room LL10 has:**

- Eye Wash Station
- Safety Shower
- Fire Extinguisher
- Chemical Spill Kit
- Calcium gluconate gel for HF exposure

**Room LL09 has:**

- Eye Wash Station
- Safety Shower
- General Fire Extinguisher
- Class D Fire Extinguisher



**Evacuation procedure in case of a fire alarm**

1. Vahid Dehnavi and Sridhar Ramamurthy are the Building Emergency Team Members from SSW. During a fire evacuation, they will be wearing blue reflective vests.
2. Shut off open flames, make sure hazardous experiments are safe, and close sashes on fume hoods. (Note that these types of experiments cannot be performed after hours).

- Move quickly and calmly to the nearest safe stairwell/exit shown in the Emergency Evacuation Plan below. DO NOT use the elevator. If you are the last to leave an area, close the door behind you.

## Emergency Evacuation Plan

Convergence Centre - Lower Floor  
999 Collip Circle, London, ON N6G 0J3



- Once outside, move away from the building and go to the meetup location in the parking lot at the Convergence Centre located here:



5. Pass on any relevant information to the Building Emergency Team or Responding Crews and an SSW staff member (if after hours please call the relevant staff members).
6. Wait until you are notified to re-enter the building by the Building Emergency Team or Responding Crews.

### Working alone and after-hours

- After-hours refers to weekdays outside of the time period 8 am to 4 pm, on weekends, and any holidays set by the University when SSW is closed, locked, and regular staff are not present.
- It is strongly advised to avoid working alone in the lab after hours.
- As noted above, any use of an instrument at SSW must be booked in advance with a staff member; this applies to after-hours as well. When booking after hours, please be on time for the period booked.
- Only persons who have been approved by SSW staff may access SSW and conduct research after hours – persons who are unknown to SSW staff are not permitted within SSW after hours. Family, friends, guests, visitors, and/or any other unauthorized individuals are prohibited from accessing the lab after hours. Failure to comply could lead to the loss of after-hours access. If you are undertaking a laboratory task that requires you to have another person within the lab (see table below) then that person needs to be trained and approved by SSW staff as well.
- If a **radioactive sample** is analysed in a particular room, you cannot access the room or the instruments in the room after hours **unless** you have completed the radiation safety training. If this situation arises, please coordinate with your SSW contact during working hours to determine the best course of action.
- A staff member's emergency number is located outside each laboratory if needed after hours.
- The table below indicates which activities are (1) prohibited after hours, (2) allowed after hours but working with a work buddy, and (3) allowed alone after hours. If you work alone, you must notify someone (work buddy) and keep them informed of your location, and have that person available to assist you if needed. Your work buddy needs to be within hearing distance or you have some kind of check in system with your work buddy, e.g. call every 20 mins or check in-person. Note that if work is performed after hours and someone accompanies you to the lab so that you are not working alone, that person must also be fully trained and authorized to work in the laboratory. This list may not necessarily be exhaustive.

| Prohibited after hours   | Allowed working after-hours, but not alone (someone else has to be present at SSW with you) | Allowed working after-hours (you will need to inform someone else that you are working alone at SSW and have that person available to assist you if needed) |
|--|---|---|
| Any work with an open flame  | UV Vis spectroscopy   | Optical microscopy  |
| All work with strong acids, bases, or any other hazardous chemicals* | Contact angle   | SEM/EDX   |
| Polishing and grinding   |   | FTIR  |
| Work with radioactive materials                                      |   | TGA and DSC   |
| Electrochemistry*  |   | Micro-CT (with badge)   |
| ICP-MS   |   | Profilometer  |
|  |   | DSIMS   |

|  |  |                  |
|--|--|------------------|
|  |  | XPS              |
|  |  | XRD (with badge) |
|  |  | ToF-SIMS         |
|  |  | Auger            |
|  |  | AFM              |
|  |  | CLSM             |
|  |  | Raman            |

\* Benign wet chemistry and electrochemistry (e.g., using NaCl) could possibly be approved, but check with SSW staff first for approval on a case-by-case basis.

### Access may be prohibited

- SSW may prohibit access to the lab to those who fail to abide by any Health and Safety Regulations, any of the statutes outlined within this Policy/document, or any other University policies, regulations, guidelines, practices, directions, or instructions. Failure to abide by these rules may result in being asked to leave the laboratory, limitation/revoking of after-hours access, or requiring additional training before proceeding with your work. Repeated infractions may result in the denial of entry into SSW. Further, SSW reserves the right to directly contact your academic supervisor to convey your laboratory conduct to them.

### Agreement

I have read and understood the above guidelines and I am familiar with the Health and Safety Procedure Surface Science Western safety Policy/document. I agree to all of the statutes outlined above and agree to follow them to the best of my abilities.

Trainee \_\_\_\_\_

Signature and Date

Lab Trainer \_\_\_\_\_

Signature and Date