

# Sample Preparation Laboratory at the Liquids Reflectometer Training Document

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SPALLATION NEUTRON SOURCE

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Approved By

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Lead Instrument Scientist	Date
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NSSD ES&H/Operations Manager	Date

# Sample Preparation Laboratory at the Liquids Reflectometer Training Document

## 1. New Users are asked to do the following:

- 1.1. Take the on site liquids reflectometer laboratory safety training. The training is a short tutorial of the general rules and information related to our laboratory. A walkthrough of the laboratory will accompany and complete this training tutorial.
- 1.2. Plan what type of equipment and supplies you will need. Talk to your contact and/or Candice Halbert (865-643-2334) to help set up in the laboratory.
- 1.3. Plan for the disposition of materials at the end of your experimental time. SNS will not store hazardous materials or samples for future experiments

## 2. Available Equipment:

- Fume hood-users wishing to leave equipment unattended in the fume hood should contact the beam line staff.
- Cabinets for flammable materials and acids (below fume hood).
- Refrigerator and Freezer
- Deionized high-purity water system
- 5.7L Ultrasonic cleaner
- Mettler Toledo balances
- UV-Visible Spectrophotometer
- Single Wafer Spin Processor
- Temperature Control Centrifuge
- Langmuir- Blodgett Trough
- Eyewash and Shower
- Vortex Mixers and Hotplate-Stirrer
- Vacuum Oven (200°C)

## 3. Safety Rules

- 3.1. All of the usual precautions for work with chemicals apply in the Sample Preparation Chemistry laboratory. Some additional rules are necessary because it is a multi-user laboratory. Keep in mind that, while your own work may not

require a given precaution, other users' work may involve hazards not obvious to you.

- 3.2. For your protection, all concentrations of acids and bases are to be used in small quantities and stored in containers <500 mL or smaller.
- 3.3. A binder containing the Material Safety Data Sheet (MSDS) of all the chemicals used in the Sample Prep lab. is stored in a marked cabinet in the laboratory. MSDSs for the chemicals are also available on the HMMS inventory safety page.
- 3.4. If you need to dispose of glass, please place it in the "Glass Only" waste receptacle.
- 3.5. A certified eyewash is provided for your safety. In the event that chemicals are accidentally spilled on you, a drench hose is located at the sink to remove chemical contact on skin. This usage must be reported to Candice Halbert once chemicals are removed from skin.
- 3.6. **If medical attention is required, call the LSS at 574-6606.**

#### 4. Personal Safety

- 4.1. Do not eat or drink in the laboratory.
- 4.2. Eye protection (ANSI approved safety glasses) must be worn at all times; protective gloves and lab coats are available when needed. Closed toe shoes are required for entry into the laboratory.
- 4.3. The appropriate gloves and face protection must be used when performing work with very reactive chemicals. (See MSDS for personal safety)
- 4.4. As a safety precaution it is recommended that another person be present in the laboratory or the instrument control cabin if you are performing procedures in which hazardous conditions (reactions) may occur.

#### 5. Labeling

- 5.1. Label all equipment that you are responsible for with your name and a phone number at which **you** can be reached. (This is NOT the BL4B instrument phone)

- 5.2. Label and date all chemicals that are not in their original containers, giving the names of the chemicals, your initials, and the date that the chemical was placed into the new container.

## 6. Hazardous Materials

- 6.1. When working with hazardous chemicals, use the smallest quantity necessary for your experiment. Transport only the amount you need to the Instrument Cave to perform your experiment.

## 7. Chemicals Spills

- 7.1. All spills must be assessed for potential hazards and managed appropriately.
- 7.2. If a spill is considered small and you are familiar with the hazard and have the proper protective equipment, you may clean it up using the spill kits in the laboratory.
  - 7.2.1. If the spill requires no emergency response, but you are uncomfortable cleaning up spill for whatever reason contact beam line staff.
- 7.3. If a spill poses a hazard to personnel, equipment, or the environment, call the LSS at 865-574-6606 to get assistance with this spill.
- 7.4. Do not attempt to clean up a hazardous spill yourself. Warn others of the hazardous waste (including the absorbent from the spill kit) and report this to Candice Halbert (865-643-2334) or David Fuller (865-384-7608).
- 7.5. Keep the Chemistry laboratory clean. Ensure that all glassware and surfaces you have used are clean before you leave the laboratory.

## 8. Chemical Disposal

- 8.1. **Do NOT pour any chemical down the drain.**
- 8.2. Material and Sample Disposition
  - 8.2.1. Any chemical that has flammable, corrosive, reactive, explosive, or toxic properties is considered hazardous and must be disposed of properly.

8.2.2. **Hazardous materials may not be poured down the drain or put directly into the garbage.** Any unwanted hazardous material must be placed in the appropriate container or area.

8.2.3. Users generating by-products from chemical synthesis or sample manipulation should contact Candice Halbert or David Fuller for help with its eventual disposition.

### 8.3. Acidic and Basic Materials

8.3.1. The maximum allowable acid usage, all concentrations, at one time is 500 mL.

8.3.2. Each type of waste should be disposed of using the designated waste bottle. Record any waste put into the waste container on the chart that is specifically labeled for acids or bases located on a clipboard by the waste containers.

### 8.4. Organic Materials

8.4.1. Decant all materials that contains organic compounds, solids and liquids, into the container that is labeled "Organic Compounds Only".

8.4.2. Record any material that is put into the container on the chart labeled "Organic Chemicals Only" that is located on a clipboard by the containers.

8.4.3. Organics used for cleaning glassware, ethanol and methanol, should be collected and disposed of in the organic container.

8.4.3.1. A Kim wipe soaked in acetone may be used to clean off glassware and placed in the trash when cleaning is completed.

### 8.5. Deuterated Materials

8.5.1. Any materials that contain deuterated compounds, even if it contains other types of chemical, should always be disposed of using the carboy labeled "Deuterated Compounds Only".

8.5.2. Record any materials placed into the container on the chart labeled "Deuterated Chemicals Only" which is located on a clipboard by the containers.

## 9. D<sub>2</sub>O Usage

9.1. D<sub>2</sub>O is a controlled material on the Oak Ridge National Laboratory site, therefore special precautions and rules must be followed while using this material.



- 9.2. D<sub>2</sub>O will be distributed on an as needed basis. Users requiring this material must inform beam line staff prior to their visit to SNS.
- 9.3. Nuclear Material Handler training, and balance training is needed to handle D<sub>2</sub>O; this training is provided by the Nuclear Material Control and Accountability Representative Greg Rowland, 865-576-6445.
- 9.4. Any quantity of D<sub>2</sub>O that is used in an experiment must be accounted for and documented on the check sheet provided.
- 9.5. Samples containing this material must be disposed of in the appropriate labeled container.

## 10. Conclusion

Remember, this is a user facility, and your work will not be the only work taking place in the lab, please be courteous and respectful in the lab. We will all work together to keep the lab a clean and safe place to carry out our experiments in. If any situation that is not covered in this procedure arises or you have questions, please contact Candice Halbert at 865-643-2334, to address your concerns.