



## 7.U-4B.8.2

### Handling of Liquid/Solid Sample Cells at the Liquids Reflectometer – BL 4B

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## SNS-OPM 7.U-4B.8.2

### Handling of Liquid/Solid Sample Cell at the Liquids Reflectometer- 4B

#### 1. Purpose

- 1.1 This procedure provides instructions on the steps required to handle liquid samples in a liquid/solid cell that have been exposed to the neutron beam at the Liquids Reflectometer.

#### 2. Responsibilities

- 2.1 The **Liquids Reflectometer Instrument Scientist** or designee is responsible for ensuring that personnel required to handle samples read, understand, and follow this procedure.
- 2.2 The individuals performing this procedure are responsible for reading, understanding and following this procedure, and for reporting any problems encountered while performing this procedure.

#### 3. Prerequisites

- 3.1 SNS staff and users must read [SNS-OPM 3.A-1.5.4B.2](#), "Operation of the Liquids Reflectometer User IPPS Panel".
- 3.2 Individuals handling chemicals while performing this procedure **must** wear safety glasses and protective gloves.

#### 4. Precautions

- 4.1 Failure to follow or complete this procedure may result in the unintentional release of activated samples to non designated areas. This could lead up to the termination of your experiment and/or loss of beam time at the Instrument.

#### 5. Procedure

Step Number	Procedure/Actions to be performed
5.1	Obtain the SNS Job Hazard Analysis for Handling of samples used at the SNS Liquids Reflectometer, and read, complete, and sign this document.

<p><b>5.2</b></p>	<p>Obtain a Portable Geiger Mueller Detector, provided by the Radiation Control Technician, located in the beam line 2 hallway.</p> 
<p><b>5.3</b></p>	<p>Visually inspect the instrument and verify that the detector is within the calibration date. Ensure that the GM detector is initialed for the date that it will be used. This confirms that the detector has been source checked.</p> 
<p><b>5.4</b></p>	<p>Turn the large black knob in the center of the meter to the bat. position. The needle should fall within the “bat. ok” range. If this does not occur, contact a RCT to receive another GM detector. (574-6588 or 574-7631)</p> 

<p><b>5.5</b></p>	<p>Turn the large black knob to the x100 position.</p> 
<p><b>5.6</b></p>	<p>Check the audio knob on the detector and make sure that it is set to the “On” position.</p>  <ul style="list-style-type: none"> <li>• You should hear some ticking sounds coming from the detector.</li> <li>• If no sounds/ clicks are heard coming from the detector, contact a RCT to receive another GM detector. (574-6588 or 574-7631)</li> </ul>
<p><b>5.7</b></p>	<p>Verify that the Response knob is turned to the slow position.</p>
<p><b>5.8</b></p>	<p>Take the Portable Geiger Mueller Detector to the sample on the sample stage, and hold the head as close as possible to the sample, without touching.</p> <ul style="list-style-type: none"> <li>• If the needle stays within the scale, then it is okay to manipulate the liquid contained in the cell.</li> </ul>



- If the needle goes off of the scale, then call a RCT **immediately** to handle the radioactive sample. (574-6588 or 574-7631)

## 5.9

Once the sample is deemed moveable perform one of the following wearing gloves and safety glasses:

5.9.1 If the liquid is to be changed in the sample cell, than:

5.9.1.1 Move the sample cell to the radioactive sample storage bin located inside of the instrument cave. Remove the liquid in the sample cell via a syringe and decant the liquid into the proper chemical storage bottle on the sample storage bin. Inject the next liquid into the cell that will undergo analysis. Place the sample cell back onto the sample stage for analysis.



5.9.2 If the sample analysis is complete, than:

5.9.2.1 Move the sample cell to the radioactive sample storage bin located

inside of the instrument cave. Remove the liquid in the sample cell via a syringe and decant the liquid into the proper chemical storage bottle, and place the cell into the radioactive sample storage bin.



Syringes and gloves can be discarded in the appropriate trash receptacle.

**5.10** The sample cell can **not** be opened without the presence of an RCT to survey sample and liquid that was removed from the sample stage.

**5.11** To have a sample removed from the cave (released) that has been in the neutron beam at the Liquids Reflectometer instrument, you **must** contact a RCT at 574-6588 or 574-7631. ***Radiological Control Technicians are the only staff at SNS who can release potentially radioactive or radioactive samples from posted areas.***

## 6. Documentation

- None

## 7. References

- SNS-OPM 3.A-1.5.4B.2, Operation of the Liquids Reflectometer User IPPS Panel. <https://www-internal.sns.gov/operations/SNS-OPM/03-A-01-05-4B-02.pdf>
- SNS-OPM 7.U-4B.8.1, Sample Handling at the Liquids Reflectometer – BL 4B. <https://www-internal.sns.gov/operations/SNS-OPM/07-U-4B-08-01.pdf>
- *Liquids Reflectometer BL4B Hazard Identification and Analysis*, SNS document number 107060000-ES0001-R00.

## 8. Attachments

- None