

# Before, During and After the Experiment

Before the Experiment

The Day Before the Experiment

During the Experiment

After the Experiment

Scattering Length Density, Incoherent  
Scattering from Hydrogen

Useful info online

# Before the Experiment

Write very carefully a [beamtime proposal](#). The process is competitive.

The proposal gets 5 reviews and beamtime allocation is made. Your [beamtime gets scheduled](#).

If you are not on our access list, you must perform the [NCNR online safety training](#) before you get here and schedule a [safety tour](#) for the day before your experiment.

**WATCH OUT!** If you miss more than 50 % of the questions on the safety training, you'll not be able to retake the quiz till your NCNR contact requests authorization from the NCNR management (the director).

Note that all users, including US citizens, should [bring a valid passport](#) when coming to the NCNR as well as a [“Trustworthy Memo”](#).

New users that are not US citizens must [register](#) for training at least 35 days [prior to their visit](#). US citizens can register 3 days in advance.



# The Day Before the Experiment

After you're finished with safety training, your local contact will help go over the [safety checklist in the lab](#). This check list will involve items in the lab as well as at the instrument.

Your local contact will show you the radiation detector that you must use to [clear any irradiated sample](#) before they could be taken out of the guide hall and into the lab. Culprits to watch out for are Na (less than 1mg), and P (less than 10 mg).

A visit to the [Health Physics lab](#) is customary and you're given an HP form that will be needed at the end of your beamtime.

At this stage, you could go down to the User Office and [receive a badge](#).

Your local contact will [check out sample cells](#) for you and discuss appropriate “standard” configurations and sample environments. Take the time to clean the cells and fill them to be ready.

# During the Experiment

**Instrument configurations** are saved at the beginning of your beamtime.

Make sure to measure overhead runs (empty cell, blocked beam, etc) early on.

Your local contact will help save **data reduction** protocols so that you could reduce data as soon as they are collected.

Plan your data acquisition efficiently and **finish on time**.

**Discuss results** with your local contact who could be your committed helper.

# After the Experiment

Please make sure that you stay for at least 3 hours after your beamtime is over to [clear your measured samples](#) with Health Physics before they could be taken out of the building or transferred to waste.

If irradiated samples clear the radiation monitoring detector, they could be taken to the lab and transferred to vials. Take these vials along with the filled [Health Physics form](#) to the HP room and alert the staff member on call for that week that you left samples to be checked. When filling out the HP form, please [include only atomic contents](#) (mass of major elements in the vial like C, D, H, O, Na, S, etc), not molecular content.

The HP staff member will take a couple of hours to check the samples and get back to you. If samples clear, then they could be [transferred to waste or taken out of the building](#).

If transferred to waste, fill out the waste label and transfer to the waste cabinet.



# Scattering Length Density Calculation

D<sub>2</sub>O

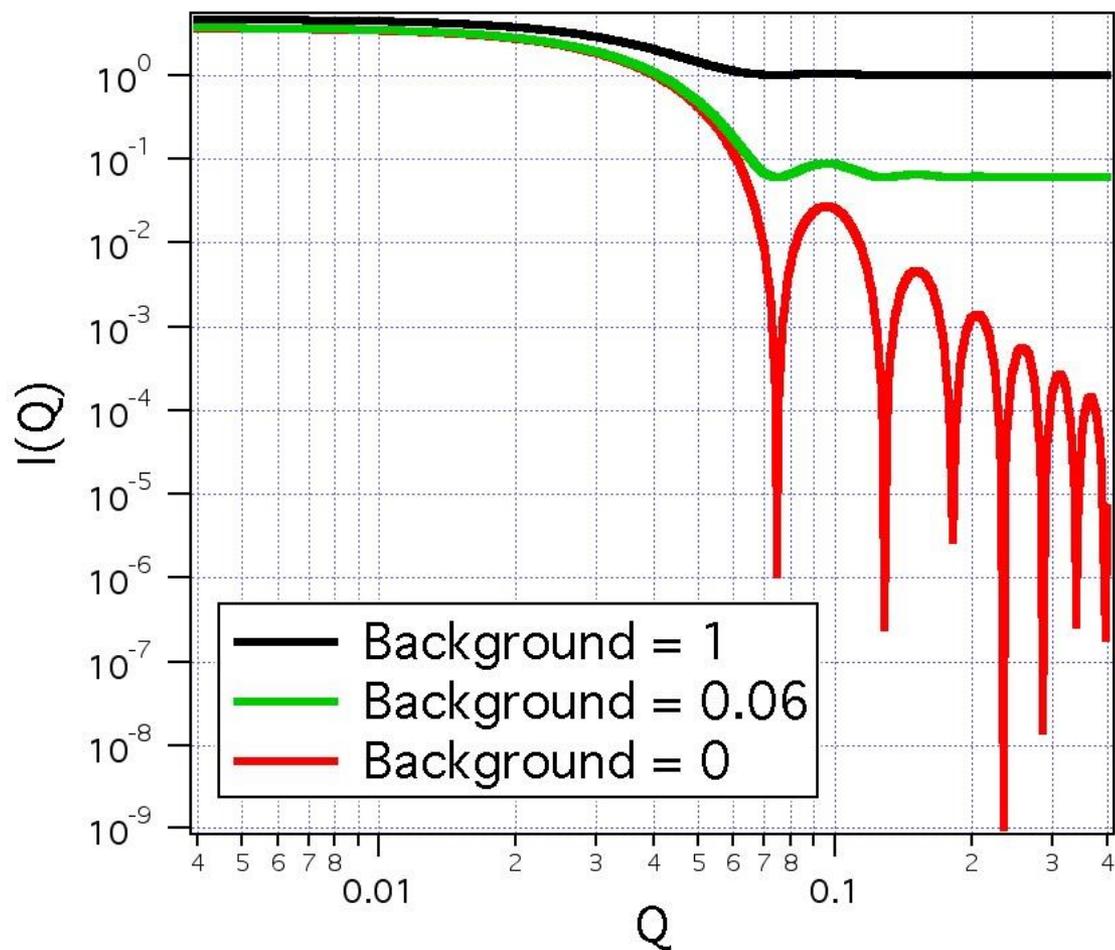
Compound	D2O
Density (g/cm <sup>3</sup> )	1.1
Wavelength (Å)	6
<input type="button" value="Calculate"/>	
Neutron SLD	6.33E-6 (Å <sup>-2</sup> )
Cu Ka SLD	9.36E-6 + 2.98E-8i (Å <sup>-2</sup> )
Mo Ka SLD	9.33E-6 + 5.59E-9i (Å <sup>-2</sup> )
Neutron Inc. XS	0.138 (cm <sup>-1</sup> )
Neutron Abs. XS	1.35E-4 (cm <sup>-1</sup> )
Neutron 1/e length	1.549 (cm)

SDS

Compound	CH3C11H22SO4Na
Density (g/cm <sup>3</sup> )	1
Wavelength (Å)	6
<input type="button" value="Calculate"/>	
Neutron SLD	3.33E-7 (Å <sup>-2</sup> )
Cu Ka SLD	9.23E-6 + 5.4E-8i (Å <sup>-2</sup> )
Mo Ka SLD	9.19E-6 + 1.16E-8i (Å <sup>-2</sup> )
Neutron Inc. XS	4.46 (cm <sup>-1</sup> )
Neutron Abs. XS	0.0656 (cm <sup>-1</sup> )
Neutron 1/e length	0.2207 (cm)

<https://www.ncnr.nist.gov/resources/activation/>

# Avoid Hydrogen in your Samples



In H<sub>2</sub>O:  
 $I(0)/\text{bkg} \sim 4$

In D<sub>2</sub>O:  
 $I(0)/\text{bkg} \sim 60$

# SASCALC

**SASCALC**

Instrument

NG3  NG7

Huber  Chamber

5.08 cm

1/2"

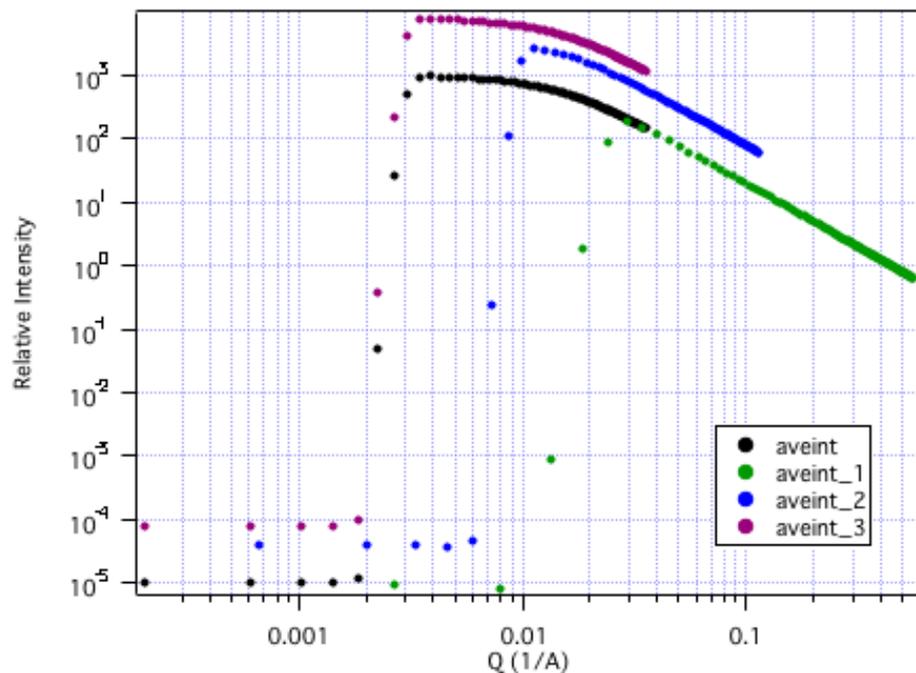
Det Dist (cm) 1300

Offset (cm) 0

Lambda 6 0.115

Lenses?  Simulation?

Freeze Clear ? Done



**Trial\_Configuration**

Source Aperture Diameter = 5.08 cm

Source to Sample = 1472 cm

Sample Aperture to Detector = 1305 cm

Beam diameter = 7.24 cm

Beamstop diameter = 3.00 inches

Minimum Q-value = 0.0036 1/Å (sigQ/Q = 29.7 %)

Maximum Horizontal Q-value = 0.0258 1/Å

Maximum Vertical Q-value = 0.0258 1/Å

Maximum Q-value = 0.0364 1/Å (sigQ/Q = 5.5 %)

Beam Intensity = 379570 counts/s

Figure of Merit = 1.37e+07 Å<sup>2</sup>/s

Attenuator transmission = 0.0138 = Atten # 5

\*\*\*\*\* NG 7 \*\*\*\*\*

Sample Aperture Diameter = 1.27 cm

Number of Guides = 1

Sample Chamber to Detector = 1300.0 cm

Sample Position is Chamber

Detector Offset = 0.0 cm

Neutron Wavelength = 6.00 Å

Wavelength Spread, FWHM = 0.115

Sample Aperture to Sample Position = 5.00 cm

Lenses are OUT

# Useful Info Online

<http://www.ncnr/nist.gov>

SANS Homepage	<a href="/programs/sans">/programs/sans</a>
<b>Calculation tools</b>	<a href="/resources/index.html">/resources/index.html</a>
<b>Reduction and Analysis</b>	<a href="/programs/sans/data/red_anal.html">/programs/sans/data/red_anal.html</a>
Instrument information	<a href="/programs/sans/sans_inst.html">/programs/sans/sans_inst.html</a>
Available Equipment	<a href="/programs/sans/equipment/index.html">/programs/sans/equipment/index.html</a>
User Laboratories	<a href="/userlab">/userlab</a>
Access information!	<a href="/access.html">/access.html</a>
Proposal information	<a href="/beamtime.html">/beamtime.html</a>
<b>Monetary Assistance</b>	<a href="/outreach.html">/outreach.html</a> (Support for first time users!)
Tutorial, summer school, etc.	<a href="/staff/hammouda/">/staff/hammouda/</a>
<a href="#">Info for this summer school</a>	<a href="/staff/hammouda/summer_school/">/staff/hammouda/summer_school/</a>
<b>The SANS Toolbox</b>	<a href="/staff/hammouda/the_SANS_toolbox.pdf">/staff/hammouda/the_SANS_toolbox.pdf</a>