

Recommendations for Nanotomography at the Hard X-ray Nanoprobe

Shipping of Samples

We recommend that samples be shipped to the beamline prior to the experiment. Samples can be shipped to the following address:

Dr. Robert P. Winarski
X-Ray Nanoprobe
Center for Nanoscale Materials
Office A138 Building 440

Argonne National Laboratory
9700 South Cass Avenue
Argonne, Illinois 60439

Phone: (630) 252-9921
Fax: (630) 252-5739
E-mail: winarski@anl.gov

Data Transfer

Tomography data sets are very large. One high resolution data set can be in excess of 7 gigabytes. We recommend that researchers bring a large external hard drive with them to collect their data sets at the end of their experiments. We have tested the following systems:



Recommended Systems for Data Transfer:

My Book Essential - hard drive - 1 TB or larger - Hi-Speed USB

<http://www.cdw.com/shop/products/default.aspx?EDC=1840764#PO>

Sample Preparation Options

The field of view for nanotomography is 15 microns by 15 microns. We recommend that samples not exceed roughly 10 microns in diameter. Sample preparation normally takes place under a microscope using sub-micron manipulators. In order to prepare samples for analysis we recommend that the samples be mounted using one of the following methods:

- **Sample adhered to the top of a tungsten needle tip (Sample is adhered with superglue or equivalent)**



Cascade Microsystems Tungsten Tips [Part Number: PTT-12-25]
<http://www.cmicro.com/>

- **Sample is placed inside of a glass microcapillary tube (Special tube with 15 micron inner diameter) Samples can be placed inside of the tube or on top of the tip of the tube and fixed with adhesive**



Microcapillaries –
World Precision
Instruments, Inc.
[Special Order Part]

World Precision Instruments, Inc.
175 Sarasota Center Boulevard
Sarasota, FL 34240
Order toll-free 866-606-1974
Tel: (941) 371-1003
Toll-free Fax: (888) 322-0993
<http://www.wpiinc.com>
<http://store.wpiinc.com>
Contact: Levis Cardoso [levis@wpiinc.com]

Refer to Quote # 100521-02LC

- **Sample is placed onto a polyimide (Kapton) film support mount. Samples are adhered to the polyimide film.**



Kapton Support Mounts – Mitigen [Part Number: M1-L25-10]

http://mitigen.com/mic_catalog.php?c=MicroMounts

Available Sample Holders

Once the samples are attached to something larger that can more easily be mounted into the Nanoprobe, various holder options can be used:

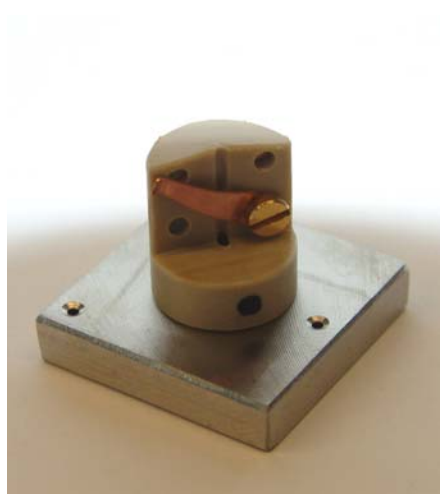


Pin Vise



Modified Magnetic Pin Base





Microcapillary Holder



Flat Back Holder

Phase Contrast Tomography Suggestions:

If you will be looking at lighter elements that do not have sufficient x-ray absorption contrast between 8 and 10 keV, then we suggest Zernike phase contrast tomography. This method will reveal qualitative structural information about the sample, but make for a challenging alignment of the tomographic projections prior to reconstruction. We recommend that a gold marker ball of about 0.5 microns in size be placed on top of the sample to aid in post acquisition alignment. Typically, a ball is selected under the microscope using a fine brush fiber, then transferred on to the top of the sample using electrostatic attraction. The gold balls can be purchased from the following companies:

Gold Powder, spherical 0.5-0.8 micron
Item number 44636

Alfa Aesar
26 Parkridge Road
Ward Hill, MA 01835
(800) 343-0660