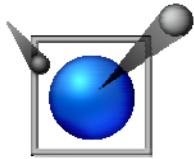


Sample Environment Highlights and Plans

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NEUTRON SCIENCES



High Pressure Collaboration & Design

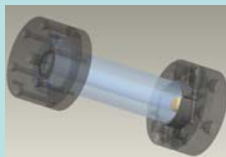


Pressure Generating Rig

Our inventory of pressure generating devices includes large inert gas rigs (10 kBar) and compact trolleys for liquids and gases ranging from 0.2 to 7 kBar. Aluminum gas pressure cells rated to 4 kBar have been purchased, and cells of various materials are under development through collaborative R&D. These include a single-crystal sapphire cell, which is well suited for measurements on BASIS, and a titanium zirconium "null scattering" alloy cell for diffraction studies.



High Temperature High Pressure Sapphire Cell



Hydrate Pressure Cell

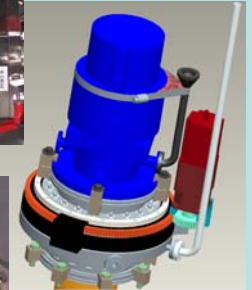
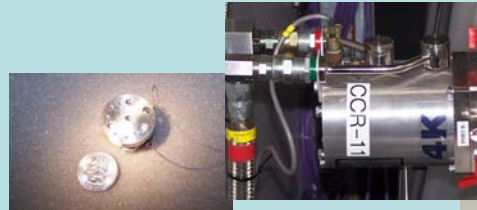


Pressure Cell Test Containment Unit



TZM High Temperature High Pressure Cell

Special Gadget Research & Design



The scope of the sample environment program is not limited to the areas of temperature, pressure, and magnetic field. Other developments include controlled gas atmosphere chambers, humidity cells, optical excitation probes, automatic sample changers and manipulators, and a variety of special sample cells. The user community has been engaged in many of these development projects, resulting in a broad range of capabilities.

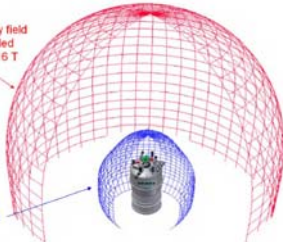
Magnetic Fields

The world's first self-shielded magnet for neutron scattering, a 5 T vertical field system, was commissioned at SNS in May 2008. A much stronger 16 T system is on schedule for delivery by July 2009. The magnetic field profile of these new shielded systems not only eliminates troublesome interference issues but also enhances the ability to use polarized neutron beam techniques. Meanwhile, older magnet systems are being updated and re-commissioned. A 4.5 T horizontal field magnet has been upgraded and commissioned on the HFIR GP-SANS. Two vertical field magnets (6 and 5 T) continue to serve as workhorses throughout the HFIR instrument suite.



16 T Magnet

5 Gauss stray field of unshielded magnet at 16 T



5 Gauss stray field of actively shielded magnet at 16 T



5 T Magnet

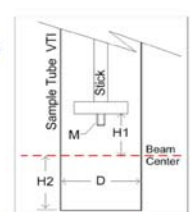


Oxford Instruments 7 Tesla Vertical Field Magnet

Equipment Inventory @ neutrons.ornl.gov/instrument_systems/sample/

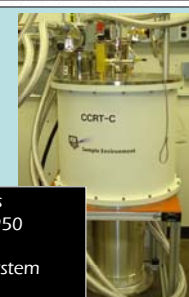
SNS Sample Environment Inventory

Device ID	Description	T[K]	Sample Space (See figure)	Options	Availability
CRYO-1	JANIS Cryo/Furnace	1.6 to 600	D = 50mm H2 = 50 mm	Site insert 300mm	Shared (all RL)
CRYO-2	Continuous Flow JANIS "SuperTran"	4 to 300	D = 50 mm H2 = 50 mm		Shared
CRYO-3	"Orange Cryostat" 70mm	1.5 to 300	D = 70 mm H2 = 70 mm		Shared
CRYO-4	Orange Cryostat 50mm	1.5 to 300	D = 50 mm H2 = 50 mm		On order
CRYO-5	Orange Cryostat 100 mm	1.5 to 300	D = 100 mm H2 = 100 mm		On order



Heliox He-3 Insert

Top Load Janis Research SHI-950 Closed Cycle Refrigerator System
Min(T)-3.6K, Max(T)- 325K, Max Sample Size- 3.185"



ILL LHe Cryostat Furnace
Min(T)- 1.8K Max(T)- 800K