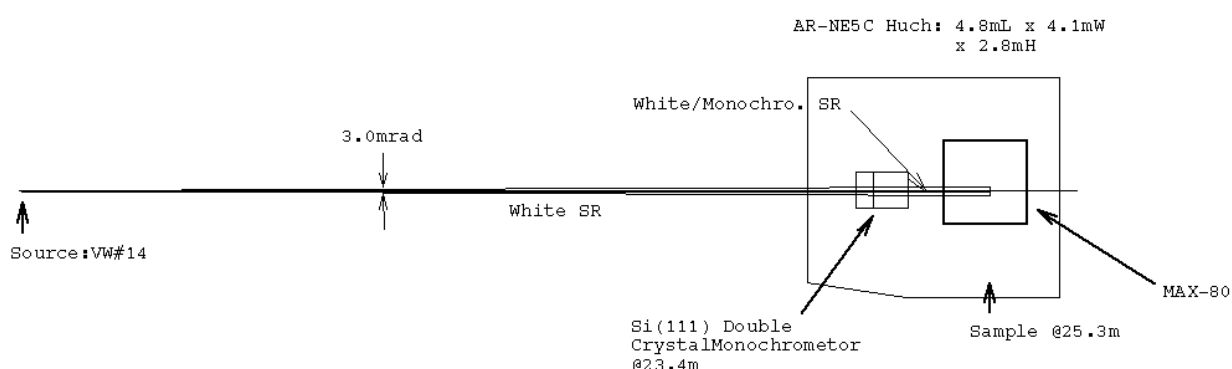


BL-NE5C High-pressure and High-Temperature Experimental Station.

BL-NE5C was reconstructed in FY1989-90 as a dedicated beamline for high pressure and high temperature X-ray studies. It provides hard X-rays from a bending magnet of the PF-AR. X-ray experiments are mainly carried out in an Energy-dispersive diffraction method by using white X-rays. However, a double crystal monochromator is also available for precise structure analysis in an Angle-dispersive diffraction method (see Ref.).

MAX80 is the first high pressure system designed for synchrotron radiation experiment and is the original one of similar systems installed in various SR facilities in the world. It was designed in order to perform various research techniques under high pressure and high temperatures such as a precise determination of lattice constant, dynamical observation of phase transitions and a structural study of new phase and liquid phase utilizing the characteristics of synchrotron radiation (i.e; the high flux, small divergence and continuous spectrum). MAX80 consists of a high pressure vessel, a 500 ton press, a two-axis goniometer, a Ge-SSD detector and computer system for data acquisition and machine control.



SCHEMATIC VIEW OF THE BEAMLINE

Area of Research

- High pressure Physics,
- Material Science and Geophysical science.

Light Source

Type: Bending Magnet of AR-NE4

Optics

- Majority of experiments use white beam.
- Double-Crystal Monochromator [Si(111) or Ge(111)] is also available in DDX method(Ref.).

Photons at Sample

Energy: 30~100 keV or White
 Energy Resolution: $\sim 5 (\Delta E/E \times 10^4)$ for Si(111)
 Photon Flux:
 Beam size: $\sim 6\text{mmV} \times \sim 60\text{mmH}$

Facilities in Experimental Station

MAX-80, High-pressure and High-Temperature Experimental System

Specifications of the device.

Press: Maximum loads 500 tons. Maximum Pressure is reached to 18GPa by using sintered diamond anvils with a center flat of 3mm square.

Anvil system: The DIA-10 type [100] cubic anvil high pressure device. Usually Single stage type anvils are operated. (Sintered diamond anvils and Tungsten-Carbide anvils are used)

Diffraction System: 2-axial goniometer with a Ge-SSD for the energy and/or Angle dispersive X-ray diffraction experiment.

Slit system: Combination of Vertical and Horizontal Slit with fixed sizes in 50, 100, 200,300 μm .

Detecting and Control System: Main Computer is Pentium-III PCwith MCA(ORTEC-2000C) running Win95 Software

Devices in Preparation Laboratories

- Stereo Microscope is equipped for sample preparation.(Nikon SMZ-10)
- Two Electric Furnaces (Max. temp 1200C and 500C)

References

"Application of an Imaging Plate to Large Volume Press MAX80 at Photon Factory", J. Chen et.al., J. Synchrotron Rad. 4(1997) 21.

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