BL5S1: A new hard X-ray XAFS Beamline at the Aichi Synchrotron Radiation Center

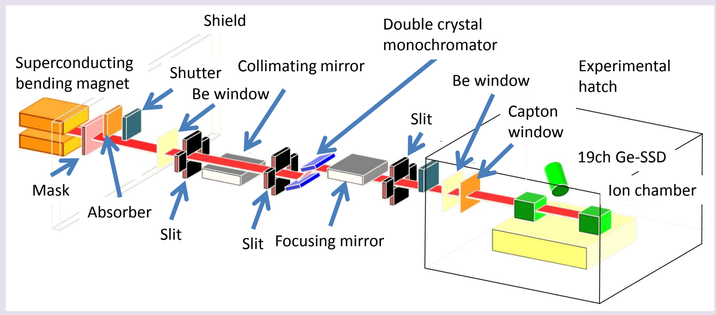
H. Asakura[1,2] • M. Tabuchi[1,2] • H. Morimoto[1,2] • A. Mano[1,2]
N. Takao[2] • N. Watanabe[1,2,3] • Y. Takeda[2,1] • Y. Baba[1,3]
[1] Synchrotron Radiation Research Center, Nagoya Univ.
[2] Aichi Synchrotron Radiation Center, ASTF
[3] School of Engineering, Nagoya Univ.

Overview

BL5S1 is designed for standard XAFS measurements using hard X-ray of 5 – 20 keV emitted from a superconducting bending magnet (5T) installed into a storage ring operated at 1.2 GeV. The emitted X-ray reaches the experimental hatch through a Rh-coated collimating mirror, a Si(111) double-crystal X-ray monochromator, and a Rh-coated focusing mirror. The X-ray optics is presently operated in two different mirror glancing angles; a standard mode for the energy range of 7 – 20 keV and a lower energy mode for the energy range of 5 – 7 keV rejecting higher order reflections.

View

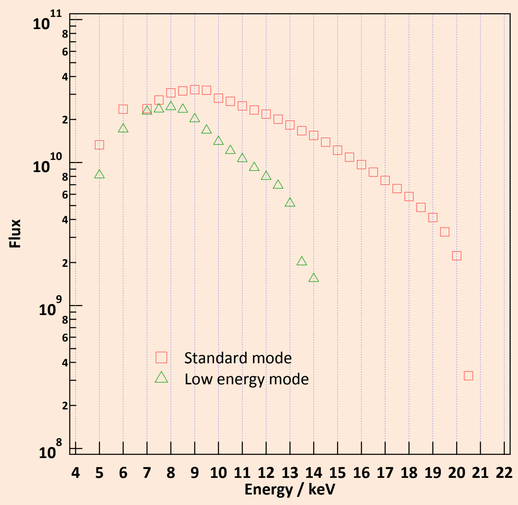
Optics



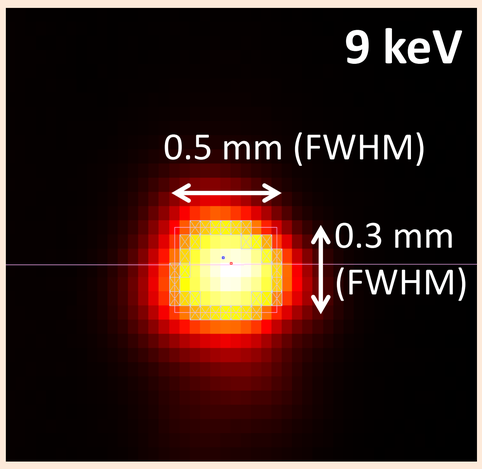
Performance

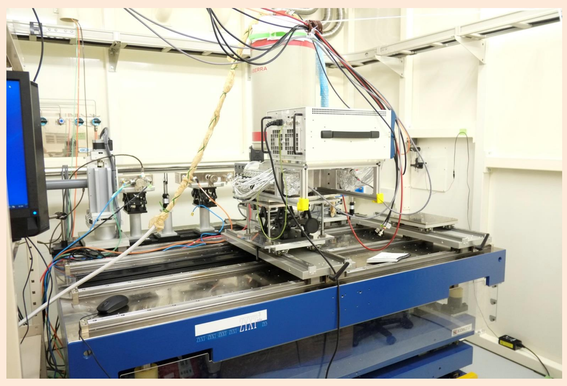
	Observed value
Energy range	5 – 20 keV
Beam size	0.50 x 0.30 mm
Photon flux	3 x 10^{10} Photons/sec@10 keV

Flux



Beam size





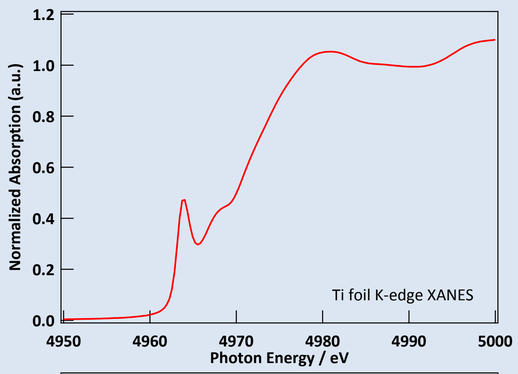
Detectors
Ion chambers x 3, 19ch SSD (Canberra)
Lytle detector, Conversion electron yield detector
1ch SDD (SII Vortex-EX-60; under maintenance)

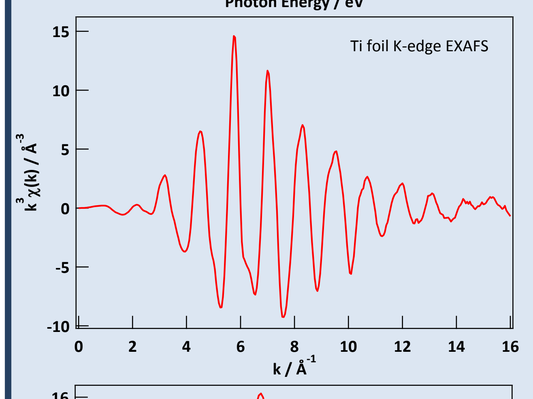
XZ sample stage, 4-axis sample stage
Sample changer
Cryostat (under maintenance), X-ray poly capillary (under maintenance)

Reference sample

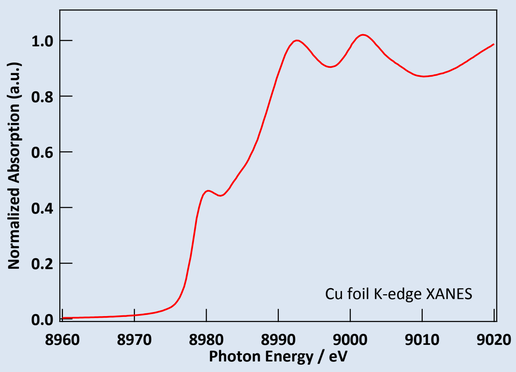
In transmission mode

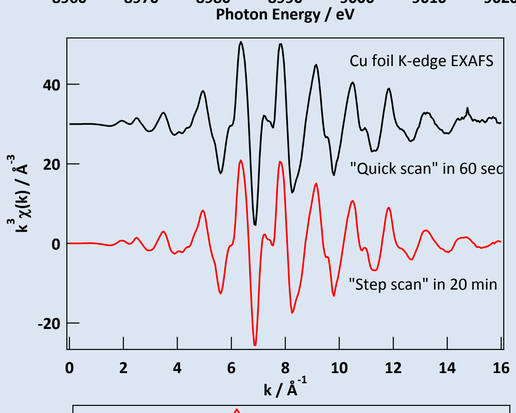
Ti K-edge XAFS



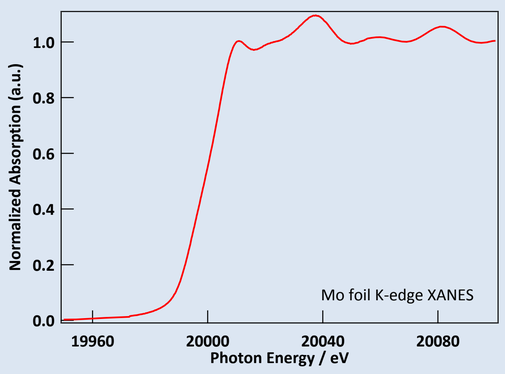


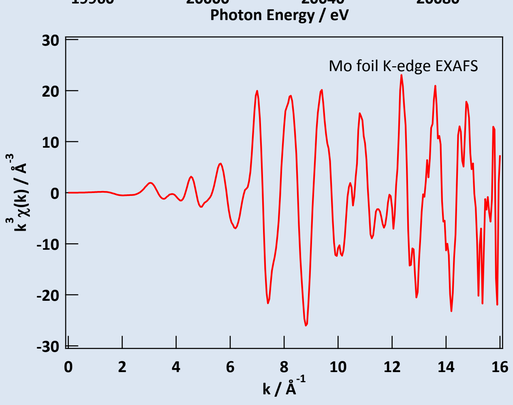
Cu K-edge XAFS





Mo K-edge XAFS

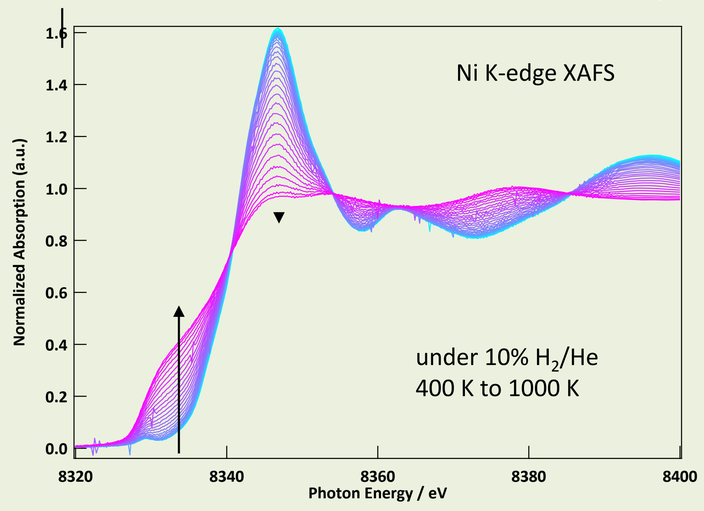




Example

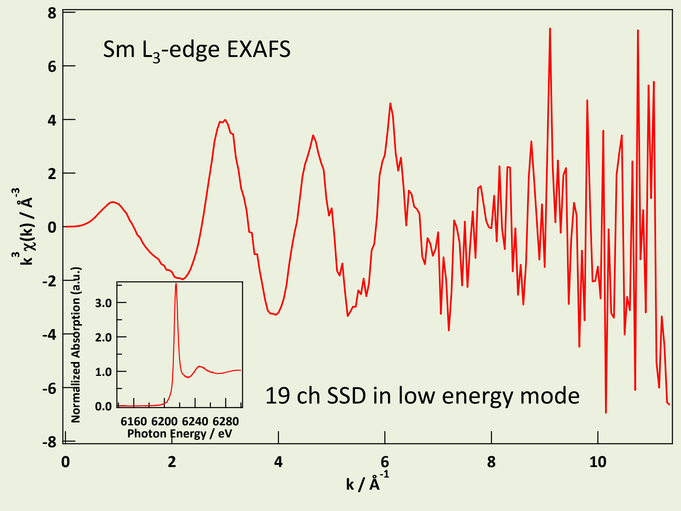
Observation of the reduction process of Ni species (Ni/SiO_2) under hydrogen flow at high temperature.

Prof. Inada, Ritsumeikan Univ., Japan



Local structure analysis of Sm in Bi_2O_3-B_2O_3-Sm_2O_3 glass

Prof. Fuchi, Aoyama Gakuin Univ., Japan



Future work

Set up of cryostat, X-ray poly capillary etc.