BL-7A: Soft X-ray Spectroscopy

This beamline provides soft X rays in the energy range of 50-1300 eV. It consists of a pre-focussing system (M0 an M1), grazing incidence monochromator (from S1 to S2), post-focussing mirror (Mf), and higher-order rejection system (Mc). The main objective of this beamline is to perform surface XAFS (x-ray absorption fine structure) and XMCD (x-ray magnetic circular dichroism) measurements at the K edges of light elements (C, N, and O) and the L edges of 3d transition metals, as well as X-ray photoelectron spectroscopy (XPS). This beamline has been constructed by Research Center for Spectrochemistry (Univ. of Tokyo) in collaboration with the Photon Factory, and now opened for all users as the other beamlines at the Photon Factory.

Area of Research:
Soft X-ray XAFS, XMCD, and XPS

Light Source:
Bending magnet

Optics:
Grazing incidence monochromator with varied line spacing gratings (VLSG) [1,2]

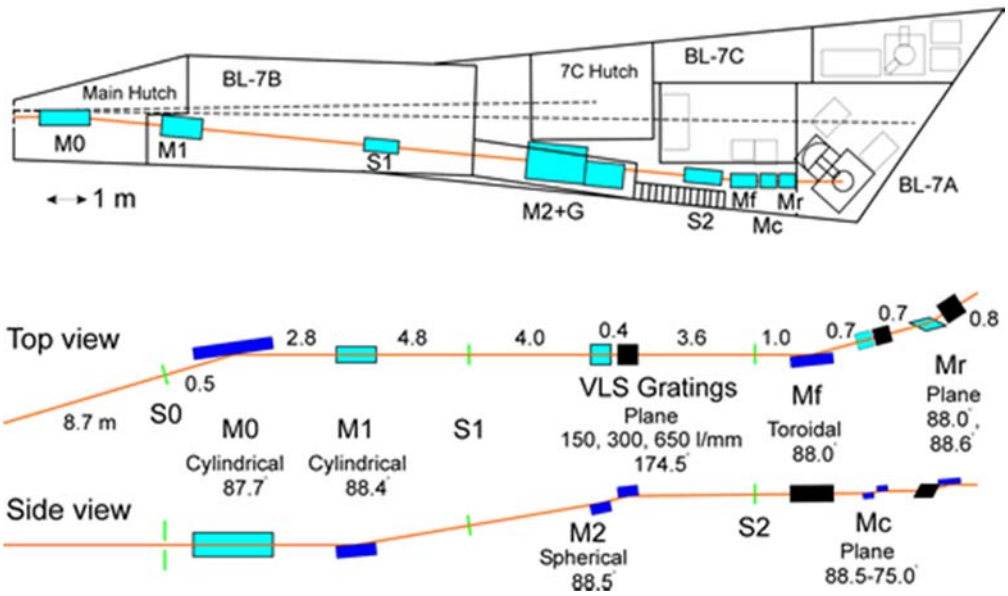

Fig. 1. Schematic layout of BL-7A

Photons at Sample:

Energy range: 50-1300 eV

Beam size: ~1 mm (v.) × 3 mm (h.)

Energy resolution and Photon Flux:

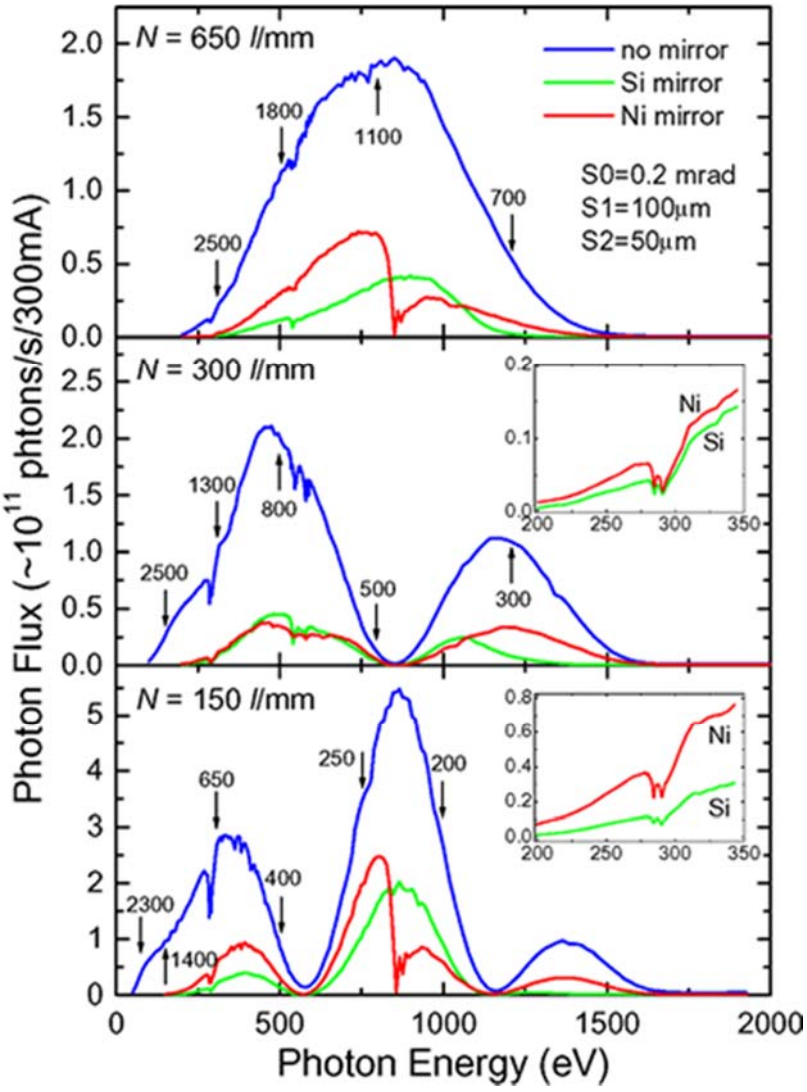

Fig. 2. Typical photon flux from BL-7A at an energy resolution, E/ΔE, indicated by an arrow.

Facilities in Experimental Station:

(1) Ultra high vacuum chamber for conventional and depth-resolved [3] XAFS measurements equipped with an imaging-type MCP (microchannnel plate) detector

(2) High vacuum chamber for XMCD measurements up to 1.2 T equipped with a SDD (silicon drift detector).

(3) SCIENTA SES-2002 electron analyzer

(4) Personal computer (Windows) with 3.5”FDD and CD-RW for data taking

References

1. K. Amemiya et al., J. Synchrotron Rad. **3**, 282 (1996).
2. K. Amemiya et al., J. Electron Spectrosc. Relat. Phenom. **124**, 151 (2002).
3. K. Amemiya, Phys. Chem. Chem. Phys. **14**, 10477 (2012).

Contact Person:

Kenta AMEMIYA (Photon Factory)
Phone: +81-298-64-5656 / Fax: +81-298-64-2801
e-mail: kenta.amemiya@kek.jp

Jun OKABAYASHI (Research Center for Spectrochemistry, Univ. of Tokyo)
Phone: +81-3-5841-4418
e-mail: jun@chem.s.u-tokyo.ac.jp