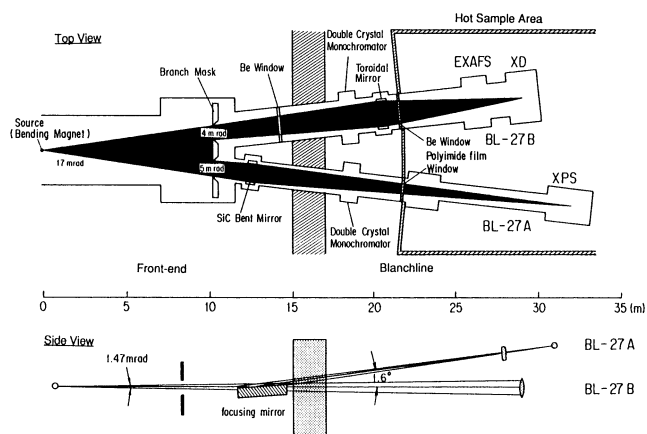


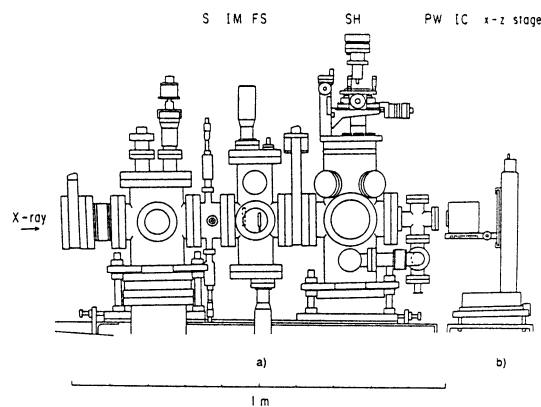
BL-27A Monochromatic Soft X-ray Beamline for radioactive samples

Experimental stations of BL-27 are located inside the "hot" laboratory where radioactive materials or samples including U or Th can be handled, in order to irradiate these samples with synchrotron X-rays or soft X-rays. The beamline is divided into two branch lines; one for soft X-rays (1.8 to 6 keV) and the other for X-rays (4 to 20 keV). In both branch lines, thin films are inserted inside the beam pipes in order to separate the hot experimental area from other cold experimental hall. From this reason, soft X-rays below 1.8 keV are not available in BL-27A.

In BL-27A, irradiation apparatus for radiobiology and photoelectron spectrometer are installed in tandem. In former apparatus, soft X-ray can be extracted into air and wet biological samples can be irradiated.



SCHEMATIC VIEW OF THE BEAMLINE



b) Photoelectron spectrometer

Manufactured by VSW. For details, see JAERI memo 05-258 (1993)

Light Source

Bending

Optics

Bent cylindrical mirror [Pt coated SiC] + Double crystal monochromator [InSb(111)]

Photons at sample

Energy range: 1.8 to 6 keV
 Energy resolution: about 1000
 Photon flux: about 10^{11} photon/s or 7 kR/s
 in Vacuum, 1 kR/s in air at 2.1 keV
 Beam size: 20 mm(h) \times 4 mm(v) at biological irradiation chamber

Facilities in Experimental Station

a) Irradiation apparatus for biological samples
 Biological samples can be irradiated both in vacuum and in atmospheric condition. Sample scanning systems can be available in both cases, in order to irradiate samples wider than the beam size. Beam intensity is measured with a specially designed free-air ionization chamber.

Devices in Preparation Laboratories

Biological sample preparation rooms are situated in this hot area. Various incubators for mammalian cells or microorganisms and other preparation or analysis equipment are available.

Other Information

The governmental law strictly limits usable amount of radioactivity. Advance consultation with beamline responsible persons is necessary.

References

- 1) H. Konishi et al., Nucl. Instrum. Methods A372, 322 (1996)
- 2) K. Kobayashi, Proc. International School of Physics, Course CXXVII, p333 (1996)

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