Evaluation of Energy Resolution of BL01B1 Using XANES Spectra of Various Metal Ions

Tsunehiro Tanaka[1] ※ , Takashi Yamamoto[1], Takenaka Sakae[1], Yoshiumi Kohno[1], Yasuo Nishihata[2], Hidekazu Kimura[3], Yoshihiro Kubozono[4], Makoto Harada[5], Masao Takahashi[6], Shuichi Emura[6], Tomoya Uruga[7], Hajime Tanida[8], Yasuhiro Yoneda[2], Akihiro Mitsuda[9]

1) Department of Molecular Engineering, Kyoto University, 2) JAERI Kansai, 3)Fundamental Research Laboratories, NEC Corporation, 4) Faculty of Science, Okayama University, 5) Faculty of Science, Osaka University, 6) ISIR, Osaka University, 7) JASRI, 8) RIKEN, 9) Department of Materials Sceince and Engineering, Kyoto University

Introduction

The beam time of 72 h was shared during the 7th cycle in June, 1997. The evaluation of energy resolution of BL01B1 beam line was carried out by collecting the spectral data during the period in the energy region 4.5 - 60 keV. This is a report of the data for and Yb L_3-edge absorption spectra.

Experimental

Yb/SiO_2 containing 3.4 mmol Yb in 1 g SiO_2 was pressed into a disc sealed with polyethlene film and used as a standard sample for the measurement of Yb L_3 edge absorption spectra. The spectral measurements were performed with Si(111) and Si(311) two-crystal monochromator at BL01B1, SPring-8. As references, the measurements for the same disc sample were performed with Si(111) two-crystal monochromator at Photon Factory BL7C and with Si(311) channel-cut monochromator at PF BL10B. For each measurement, X-ray height was 1 mm.

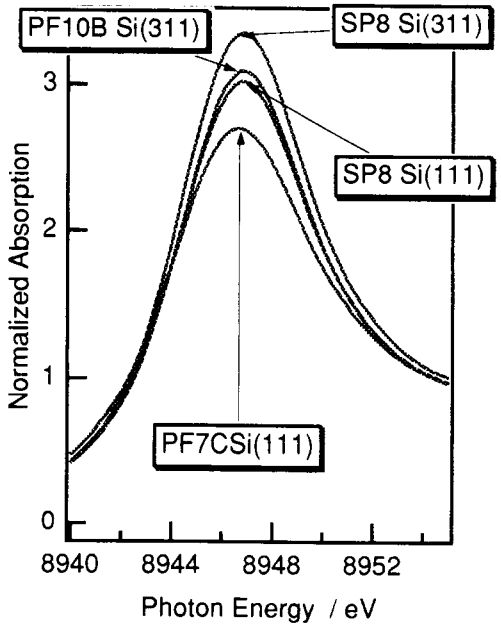

Fig. 1 White line at Yb L_3-edge of Yb/SiO_2 spectra recorded with several monochromators.

Results

Fig. 1 shows the white-lines (WLs) of Yb L_3-edge absorption spectra taken with four monochromators. Each spectrum is normalized and the peak height is a good index for the energy resolution. Evidently, WL for SPring-8 BL01B1 with Si(311) is the highest and WL for SPring-8 BL01B1 with Si(111) exhibits the same height with that for WL for Photon Factpry BL10B Si(311). This is not only due to the difference of the sample distance but due to the difference of the X-ray sourse size between Photon Factory and SPring-8.

The high performance of SPring-8 like this can be expected to be guaranted in whole the energy regions in the specification of BL01B1.