

XAFS spectrum observation system at BL01B1

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It has been attempted to construct a XAFS spectrum observation system at BL01B1 of SPring-8. The project consisted of two parts, that is, development of software and improvement of the hardware for the measurement of XAFS spectra. The former aimed at a user-friendly software, ie., anyone can use the system easily and get spectra in good and proper quality. From a user's point of view the evaluation of hardware environment, constructed by JAERI-RIKEN SPring-8 Project Team, has been done in the latter part. These two parts is inseparably related to each other.

The constructed software includes the control of the hardware in the experimental hatch and the measurement of XAFS spectra. The software, using a graphical-user-interface for easy operation, has been programmed using the DELPHI® on the Windows NT® operating system. The user-interface for the measurement was modeled after the code, HX6814, being used at BL-7C, 10B and 12C of Photon Factory, KEK, eg., the parameter file for measurement condition was similar one. But the output format in a data file is quite different from so-called "PF-Format" used in the HX6814. The format is now under discussion to unify the XAFS data format between SPring-8, PF and UVSOR, IMS, which avoids for users to prepare several platforms to read the data file got at the different SR facilities and contributes the standardization of the XAFS data.

As a result of the evaluation of XAFS spectra obtained at BL01B1, the followings have been extracted as problems to be solved; 1) poor S/N ratio of both I_0 and I , 2)

discrepancy in degree of parallelization between two monochromator crystals, 3) divergence between the angle set via BL-WS and that monitored by the encoder, 4) too long time required for a measurement and so on. Some of these has already been resolved.

The first one was mainly due to a vibration of monochromator crystal by cooling water and the vibration has decreased by decreasing both water pressure and the quantity of water. It was found out that another source of the poor S/N ratio was owing to bad quality in installation of electrodes in a gas ionization chamber. After then the chamber was improved. The second subject has been solved by tuning delta theta of first crystal with a piezo-electric element during the measurement. The back-rush has been claimed to resolve the third point but efficacy of the back-rush to the problem is now under investigation.

The fourth subject is for the requirement of extreme long time to regulate the monochromator. From the view point of the specification of the monochromator at BL01B1, moreover, a scanning angle of a monochromator from lower angle to higher angle is desirable but such scan, ie., higher energy to lower energy, does not take to the spectrum measurement. These problems are due to very the monochromator.

Several problems depending on the hardware are resolved day by day by staffs of the JASRI and corresponding improvements on the software are also forwarded by us now.

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