Characterization of BL01B1

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The beamline BL01B1 is for an x-ray spectroscopy widely receiving from 4keV to 90 keV. One of the important characters is stability of the beam intensity. Here, we examine it though the temperature factors analysis. From it, one can deduce several physical quantities also. On the other hand, however, it would lead erroneous results in XAFS analysis under certain circumstances. Therefore, careful attention and inspection of the temperature factor should be paid, and it should be one of the most importance for inpecting the beamline performance. CuI and CuBr specimens, as those show specific behavior in the temperature factor, are taken up as examples, and the symmetry of lattice vibrations and apparent bond distance originated by the large temperature factor are considered.

It is well known in the XAFS analysis that these specimens show shorter bond distances than real distances with increasing temperature. That is, in spite that the thermal expansion is observed by diffraction methods, XAFS analysis shows the distance shortening with increasing temperature. This result can use to aspect of the beamline performances, because the XAFS spectra must be observed with high S/N ratio to obtain good results. Here, we measure the XAFS spectra of CuI and CuBr carefully and we examine if the shorter bond distances are analyzed with increasing temperature or not. Figure 1 shows the bond distance between Cu and I atoms of CuI crystal as a function of temperature. Though small difference is recognized in low temperature, the agreement with the known result is enough.