XAFS

Structural studies above the X-ray absorption edge have been conducted for some time. Recently, X-ray Absorption Fine Structure (XAFS) has emerged as a powerful and widely used tool for obtaining structural and electronic information around an X-ray absorbing atom. As it is a form of spectroscopy, the energy of incoming X-rays must be varied. Synchrotron radiation is particularly well suited for XAFS, and has been used for that purpose from the outset. Currently, most XAFS studies still rely upon the use of synchrotron radiation.

SPring-8 has opened a new field in XAFS research. In the last issue, the development of a new site-selective XAFS method by using the highly brilliant X-rays from an undulator was reported. Also, X-rays from an undulator will allow fluorescent XAFS to be performed on smaller, or more dilute samples, and will add site and state selectivity. Recently, novel XAFS experiments have been conducted under conditions of high energy, such as the high critical energy from bending magnets. L-edge XAFS of lanthanide series elements and K-edge XAFS of transition elements interferes with each other, which has limited the application of XAFS in many fields. Measurements of K absorption edge of heavy elements including lanthanide series elements, have shown the strength in spite of rather limited energy resolution. Bending magnets are still a useful source for radiation used in XAFS experiments, even at a third generation facility. Examples of such experiments conducted at SPring-8 are compiled in this volume.

XAFS research has been carried out with industrial applications in mind as well as basic science concerns. Such consideration of industrial interests will contribute to the development of new industrial materials.

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