XAFS

X-ray absorption spectroscopy attracted the attention of only a handful of professional people in the early days, and no one was sure what kind of structural information could be extracted from the measurement. Around 1980, however, a new theory emerged which showed that distances to neighboring atoms from a selected element in amorphous materials can be determined by Fourier analysis of the wigglers that appear in absorption spectra. At the same time, several synchrotron radiation facilities started to supply intense white X-rays, improving the quality of the data by several orders of magnitude.

Since then, X-ray absorption fine structure spectroscopy or XAFS has been thriving at every synchrotron facility around the world, the number of which is increasing year by year. Unfortunately, however, X-rays available at most SR facilities are up to 25 keV or so, limiting such K-edge XAFS studies to elements with an atomic number less than ~ 45.

Now at SPring-8, X-rays up to almost 100 keV are available with sufficient intensity for XAFS studies. Hence, heavy elements can be investigated by K-edge XAFS, without resorting to L edges. By increasing the storage current in the near future, in addition to the high brilliance already achieved, various ambitious XAFS studies will be possible, from very dilute biological materials to very small samples in high-pressure vessel. While the search continues for scientific culmination, various routine XAFS measurements will also be carried out for both basic scientific and industrial applications .

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