ENVIRONMENTAL





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SCIENCE

SR-based XRF and XAFS methods are frequently used for investigations in environmental science, such as element mapping and speciation of environmental samples because research targets are often very dilute and amorphous forms with complex composition.

At SPring-8, XRF and XAFS studies were mostly conducted in hard X-ray beamlines. In 2011, XRF and XAFS measurement systems in the soft X-ray region, including scanning microscopy, were installed at BL27SU. New findings using these measurement systems are now being published.

Here we highlighted four topics. Yoshimura *et al.* investigated element profile and chemical state of sulfur in shells in relation to seasonal changes in the environment over long periods using μ -XRF and S *K*-edge XANES. Using XAFS, Takahashi *et al.* examined the seasonal changes in the species and concentration of Fe in an aerosol, which is a significant factor for the amount of soluble Fe in the North Pacific region and may affect the carbon cycle on the Earth's surface. Yokoyama *et al.* clarified the immobilization mechanism of As by calcite in the groundwater by determining the oxidation state and local structure of As using XAFS. Additionally, Fujimori *et al.* investigated the thermochemical behavior of Pb in fly ash during formation of chlorinated aromatics in solid waste incinerators by XAFS at combustion temperatures.

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