专刊

Transfer characterization of sulfur from coal-burning emission to plant leaves by PIXE and XANES

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摘要

The impact of coal-burning emission on sulfur in camphor leaves was investigated using Proton Induced X-ray Emission (PIXE) and synchrotron radiation technique X-ray Absorption Near-Edge Structure (XANES) spectroscopy. The PIXE results show that the sulfur concentrations in the leaves collected at the polluted site are significantly higher than those in controls. The Sulfur XANES spectra show the presence of organic (disulfides, thiols, thioethers, sulfonates and sulfoxides) and inorganic sulfur (sulfates) in the leaves. The inorganic sulfur in the leaves of camphor tree polluted by coal combustion is 15% more than that of the control site. The results suggest that the long-term coal-burning pollution resulted in an enhanced content of the total sulfur and sulfate in the leaves, and the uptake of sulfur by leaves had exceeded the metabolic requirement of plants and the excess of sulfur was stored as SO_4^{2-}. It can monitor the sulfur pollution in atmosphere.

关键词 sulfur, PIXE, XANES, atmospheric particulate patter, SO_2, leaf

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