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Characterization of loess and reactivity of the components

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Air pollution with NOx, SOx, heavy metal and polycyclic aromatic hydrocarbon (PAH) in China has become a serious problem since middle of 1990's. These pollutants have the possibility to be transported to Japan with the Aeolian dust. The Aeolian dust is mixture with clay minerals, quartz, calcite, organic acid, and so on. It is therefore important to determine what component is key material for the transportation of pollutants. In this context, soil samples and yellow sands were collected from loess plateau in the vicinity of Xian and Kanazawa, respectively. The soil samples, identified as a source of loess to Japan, are considered to be material before the contamination. On the contrary, the yellow sands are considered to be material after the contamination. The collected samples were investigated by optical microscopy and X-ray diffraction and compared with each other. The elemental distribution in fractions such as carbonate minerals, poorly crystalline iron oxides, crystalline iron oxides and clay minerals were investigated by 4-step sequential extraction procedure and subsequent ICP-MS and ion chromatography analyses. From the experimental results, clay minerals play a key role for uptake and transport of the pollutant, although the clay minerals are minor component in the soil samples and yellow sands.