Origin and distribution of sedimentary organic matter in Yellow Sea and northern East China Sea studied with carbon and nitrogen stable isotopes and radiocarbon

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In order to investigate the source and distribution of organic matter in the surface sediment of Yellow Sea and northern East China Sea, we have collected surface sediment samples from more than 300 sampling sites, and have measured their stable carbon and nitrogen isotope ratios. The distributions of organic carbon and nitrogen stable isotopes ratios are described in the entire Yellow Sea and northern East China Sea, indicating apparently lighter carbon isotope ratios at the sites near Sangdong Peninsular. In addition, 14C values of organic carbon at the surface sediments are also determined at the same sites. 14C values of organic carbon range from 10930±80 to modern. In the near Sangdong Peninsular, the oldest 14C age of organic carbon corresponds to the lighter stable carbon isotopes ratios, reflecting large contribution of terrestrial organic carbon. However, 14C value of organic carbon in the central basin of Yellow Sea is close to modern, which is mainly contributed by marine organic carbon. Other sites in the shelf regions show around 2000 of 14C age. Some sedimentary organic carbon was younger than 2000 14C age in the northern East China Sea where is the area affected by Tsushima Current. In the current study, the 14C values of organic carbon in the surface sediment of Yellow Sea and northern East China Sea seems to be strongly influenced by the transport of terrestrial organic carbon as well as petroleum derived organic carbon from the coastal regions.

Mineralogical characterization of thermal treated chrysotile and tremolite asbestos in soils

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Asbestos-containing soils occur mainly at ultramafic rocks and hydrothermally altered carbnate rocks in S. Korea. Remediation of asbestos-containing soils is considered a high priority by the Korean Government because these soils, if left untreated, represent a hazard to the environment and human health. Thermal transfomation asbestos-containing waste used to detoxify asbestos may potentically be adapted to achieve remediation of the asbestos-containing soils. The objectives of this study were to provide information related to the thermal effects on asbestos and to examine mineralogical characteristics of the thermal treated asbestos-containing soils.

Two soils, a soil weathered from serpentinite rock and a soil weathered from hydrothermally altered carbonate rocks, were selected for thermal treatment and mineralogical characterization. The mineralogical characterization approach was designed to obtain basic information relating to the nature of asbestos in the soils. TG-DTA anlysis was used to find the optimum temperature for thermal treatement of the two asbestos-containg soils. PLM, XRD, SEM, TEM and EDS analyses were used to examined the mineralogical properties of asbestos in soils before and after the thermal treatment.

PLM, SEM and TEM analyses showed chrysotile contained in the soil weathered from serpentinite rock and tremolite asbestos contained in a soil weathered from hydrothermally altered carbonate rocks. Chrysotile and tremolite asbestos in soil were transformed to forsterite and diopside at 820℃ and 1060℃, respectively. Chrysotile fibers were transformed into rod-shaped forsterite at 820℃. Tremolite asbestos was transformed into non-fibrous diopside 1060℃. The theramal treated asbestos, chrysotile and tremolite asbestos, was non-fibrous. These results indicated that thermal treatment of asbestos-containing soils was effective for detoxification of the asbestos and can be applied to treat the asbestos-containing soils.

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