

Mineralogical characteristics of asbestos in soil at Susan, Jecheon, Chungbuk, South Korea

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Naturally occurring asbestos (NOA) occurs in rocks and soil as a result of natural geological processes. The objective of this study was to characterize naturally occurring asbestos in soil from Susan, Jecheon, S. Korea.

The geological setting of Susan area consisted of dolomite, limestone and lime-silicate rock of the great limestone series of Ordovician, afterward, biotite granite of Bulguksa series of Cretaceous intruded in part. The dolomite was hydrothermally altered by the intrusion of biotite granite. Soils containing NOA sampled from three areas: (1) a soil sample weathered from the hydrothermally altered dolomite quarry (2), 27 soil samples weathered from hydrothermally altered dolomite (3), 39 soil samples weathered from lime-silicate (D area). Mineralogical characteristics of the soils (< 2 mm) were examined by XRD, PLM, SEM and EDS analyses.

XRD analysis showed the soils from three areas contained tremolite or actinolite. PLM and SEM-EDS analyses showed soils from J and G areas contained 2 % and 0.75 ~ 2.75% tremolite asbestos, respectively. And soils from D area contained 0.5 ~ 1% actinolite asbestos. Fibrous form of tremolite asbestos was dominant in J and G areas, but actinolite asbestos in D existed as cleavage fragment. These results indicated that mineralogy and form of naturally occurring asbestos depend on the parent rocks. Natural weathering and human activities may disturb the NOA-bearing soil and release mineral fibers into the air, which pose a greater potential for human exposure by inhalation.