

Effects of Mineral and Organic Compositions on Dissolution of Lead from Naturally Polluted Soils Effects of Mineral and Organic Compositions on Dissolution of Lead from Naturally Polluted Soils

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A recent amendment to the Japanese Soil Contamination Countermeasures Act requires the treatment of soils including those naturally polluted by heavy metals. Naturally polluted soils have great variety, and contain different kinds of chemical, mineral and organic compositions. Dissolution and/or leaching of heavy metals from naturally polluted soils can be significantly affected by their compositions, because both clay minerals and organic matters have strong adsorptivity. The knowledge about the effects of mineral and organic compositions on dissolution of heavy metals from naturally polluted soils is of fundamental necessity for the design of remediating naturally polluted sites.

In this study, more than 10 types of naturally polluted soil samples containing the heavy metal of Lead (Pb) were collected from abundant metal mine areas. A series of tests including X-ray Fluorescence Analysis (XRF), X-ray diffraction analysis (XRD), organic matter analysis, standard dissolution tests and sequential leaching tests were performed to exam the effects of mineral and organic compositions on dissolution of Pb from the naturally polluted soils. In addition, an artificially polluted soil by mixing a commercially available natural soil with Pb(NO₃)₂ was also prepared and similar analyses were carried out for a comparison. This presentation illustrates the details of the above experimental study, indicates the difficulties with clean-up of naturally polluted sites and proposes a methodology for assessing the applicability of remediation techniques.

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