

Effects of Immobilization with Phosphate on the Extraction and Bioavailability of Heavy Metal- Contaminated Soils

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ABSTRACT

Phosphorous additions are being proposed as a promising technology for heavy metal-contaminated soils. Single metal contaminated soils by Pb, Cd, and Zn and mine tailings were immobilized by KH_2PO_4 . After immobilization at each times and the same addition rate, the TCLP and five-stage sequential extraction procedure applied on the treated soil samples. The metals were determined after division into five fractions by sequential extraction with (1) Exchangeable, (2) Bound to carbonates, (3) Bound to Iron and Maganese Oxides, (4) Bound to Organic Matters, and (5) Residual. They showed a remarkable shift of metals towards more stable forms. The extracted concentration of metals by TCLP was decreased by reaction time. The residual fraction of Pb and the reducible fraction of Zn, Cd, Cu were increased especially while a corresponding decrease of all metals accured in the mobile fractions(exchangeable and bound to carbonates).

Key words: Heavy Metal, Immobilization, Sequential extraction procedure, TCLP, Lead, Cadmium, Zinc, Copper