

## Factors affecting the leaching behaviors of magnesium phosphate cement-stabilized/solidified Pb-contaminated soil, Part II: Dosage and curing age

\*Ping Wang<sup>1</sup>, Qiang Xue<sup>1</sup>, Zhenning Yang<sup>2</sup>, Jiangshan Li<sup>1</sup>, Tingting Zhang<sup>1</sup>, Qian Huang<sup>1</sup>

1. State Key Laboratory of Geomechanics and Geotechnical Engineering, Institute of Rock and Soil Mechanics, Chinese Academy of Sciences, 2. Department of Civil and Environmental Engineering, University of Massachusetts Amherst

Magnesium phosphate cement (MPC) is frequently used to dispose synthetically spiked Pb contaminated soils by means of stabilization/solidification (S/S) technology. Leaching behaviors of heavy metal represent the most important parameters for MPC-treated metal-contaminated soil. Little information is available for the effectiveness evaluation and leaching mechanism investigation of MPC treatment. Moreover, various factors in the S/S process would affect its effectiveness, especially leaching behaviors. Part I presented the effect of original Pb concentration in soil and water-to-cement ratio on leaching behaviors of MPC treated synthetically spiked Pb contaminated soil, and this part investigated the effect of dosage and curing age on leaching behaviors of MPC treated waste. Leaching behaviors were investigated via Toxicity Characteristic Leaching Procedure (TCLP) and semi-dynamic leaching test about different MPC dosage and curing age. Results showed that both the MPC dosage and curing age would change the leaching behaviors of MPC treated synthetically spiked Pb contaminated soil. The TCLP leaching concentration of Pb decreased with the increasing MPC dosage and curing age. The calculated effective diffusion coefficients and leachability index indicated that the MPC treated Pb contaminated soil could be used for utilization after S/S treatment. The controlling leaching mechanism of Pb appeared to be diffusion for S/S products with different MPC dosage and curing age.

Keywords: Stabilization/solidification, Leaching, Water-to-Solid ratio, Magnesium phosphate cement