

A STUDY OF SOLIDIFICATION/STABILIZATION PROCESS FOR DISPOSAL OF PENTACHLOROPHENOL

SHYAM S. SHUKLA

Department of Chemistry, Lamar University, P.O. Box 10022, Beaumont, TX 77710 (U.S.A.)

and

KWUN-CHI LEE

Department of Chemistry, Florida State University, Tallahassee, FL 32306 (U.S.A.)

Abstract

Solidification/Stabilization (S/S) are emerging technologies for disposal of toxic waste. However, they have been applied mostly to inorganic toxic wastes. In the present study, we investigated the applicability of S/S technologies for disposal of a widely used toxic organic compound, pentachlorophenol (PCP), in the cementous matrix. Effect of a number of parameters (temperature, pH, sonic energy, method of mixing) on the ability of cement to hold PCP was examined. UV-VIS spectrophotometry was used to determine the leaching of PCP from cement and FT-IR was employed to study the mechanistic details. The results of the present work indicate that PCP can be almost fully retained by the cement. A very small amount of PCP that leaches from the surface of the solidified product can be reduced to a negligible amount by encapsulating it with a cement jacket.

MICROBIAL DEGRADATION OF HAZARDOUS WASTES TO NON-TOXIC END-PRODUCTS

EMILY McCREARY¹, AYDIN AKGERMAN², ROBIN L. AUTENRIETH¹ and JAMES S. BONNER¹

¹*Civil Engineering Department, Environmental & Water Resources Engineering, and*

²*Chemical Engineering Department, Texas A&M University, College Station, TX 77843-3285 (U.S.A.)*

Abstract

The generation of large quantities of toxic wastes in the form of phenolic compounds, halogenated hydrocarbons, and volatile organic chemicals has resulted in requirements for new and environmentally safe methods for elimination. One method used to reduce the volume of toxic waste chemicals is the construction of microbial reaction systems that are capable of degrading toxic