

**DETOXIFICATION OF A HIGHLY TOXIC INDUSTRIAL SOLID WASTE USING
DIFFERENT STABILIZATION METHODS
COMPARISON AND TOXICITY CONTROL**

Th. A. IOANNIDIS, P. ELEFThERIADOU and A. I. ZOUBOULIS*

*Department of Chemistry, Laboratory of General & Inorganic Chemical Technology, Box
116, Aristotle University, GR-540 06 Thessaloniki*

ABSTRACT

Toxic metals are not biodegradable and when contained in a solid waste, they ultimately find a way to migrate into the surrounding environmental media. Different stabilization methods can be used to prevent and avoid this phenomenon. The specific solid waste examined in the present work is the residue ("ash") obtained after thermal treatment (incineration under reduced conditions) of sludges, deriving from tetraethyl-lead fuel storage tanks, which it was found to contain around 30% w/w lead and 33 % w/w iron. For this purpose, some of the most well established stabilization methods were examined such as cement stabilization, and natural fluoroapatite and synthetic hydroxyapatite addition; selected results will be presented and comparison between them, as well as with vitrification would be performed.

Standard leaching tests were applied for the toxicity examination of stabilized products and for evaluation of the effectiveness of applied stabilization methods. DIN 38414 S-4 and TCLP (Toxicity Characteristic Leaching Procedure, according to U.S. EPA) methods were used in order to determine and classify the toxicity of the final (stabilized) products, according to the most stringent environmental legislation. SEM, XRD, AAS, GF-AAS and AES techniques were used for the characterization and analytical determinations of the products.

* To whom correspondence should be addressed, e-mail: zoubouli@chem.auth.gr