Environmental Engineering and Management Journal xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
http://omicron.ch.tuiasi.ro/EEMJ/

"Gheorghe Asachi" Technical University of Iasi, Romania

LEACHABILITY OF HEAVY METALS FROM SLAG RESIDUES UNDER INTENSE TEMPERATURE AND STIRRING CONDITIONS

Konstantinos Moustakas[1G], Alexandros Mavropoulos[1,2], Katherine-Joanne Haralambous[1], Maria Loizidou[1]

[1]National Technical University of Athens, School of Chemical Engineering, Unit of Environmental Science & Technology, 9, Heroon Polytechniou Street, Zographou Campus, P.C. 15773, Athens, Greece
[2]D-Waste, 141 B, Acharnon Street, PC 104 46, Athens, Greece

Abstract

Air cooled and water cooled slag samples were obtained from a demonstration plasma gasification/vitrification unit. The leachability of the major heavy metals presents (Cr, Cu, Mn, Fe, Pb and Zn) in both the air cooled and water cooled slag when in contact with acidic solutions was investigated under different temperature, stirring and contact time conditions. Water cooled slag showed better resistance to heavy metals leaching. The vitrification process immobilised Cr and Pb. The leachability of Cu, Fe and Zn increased by heating and stirring, whereas the leachability of Mn was not affected by temperature and it was found to decrease with combined heating and stirring.

Key words: gasification – vitrification unit, metal leachability, slag, stirring, temperature

Received: September, 2014; Revised final: April, 2015; Accepted: April, 2015

[*]Author to whom all correspondence should be addressed: e-mail: konmoust@central.ntua.gr; Phone: +30 210 7723108/2334; Fax: +30 210 7723285