Desalination and Water Treatment
www.deswater.com

doi: 10.5004/dwt.2017.20436

71 (2017) 25–31
April

Evaluation of interactions among sewage sludge bioavailable metals from WWTPs using DTPA agent

Evangelos Giannakopoulos[a], Ioannis K. Kalavrouziotis[a,*], Hlias Dimitrelos[b], Prodromos H. Koukoulakis[c], Soterios P. Varnavas[b], Frantzis Papadopoulos[c]

[a]*School of Science and Technology, Hellenic Open University, Tsamadou 13-15 & Saint Andrea, 262 22 Patras, Greece, email: ikalabro@eap.gr*
[b]*Department of Geology, University of Patras, 26504 Patras, Greece*
[c]*Hellenic Agricultural Organization 'Demetra' Soil Science Institute, Thermi, 57001, Thessaloniki, Greece*

Received 27 September 2016; Accepted 11 December 2016

ABSTRACT

The diethylenetriaminepentaacetic acid extractable metal concentration, i.e., of Fe, Zn, Cu, Mn, Cd, Cr, Co, Ni, Pb, in the sewage sludge from six (6) municipal wastewater treatment plants (WWTPs) of Central Greece was evaluated. Also the elemental interactions occurring in the sludge and their quantitative contribution in heavy metals were studied according to the geographical grouping of the WWTPs in coastal and continental zone. Statistical analysis (ANOVA) between elemental interactions and quantification of their contribution in terms of heavy metals showed a significant difference in available metals between the above zones. Based on the quantification data of the interactions elemental contribution, it was found that more heavy metals were contributed to the sludge of the continental zone than to that of the coastal, due to the fact that more antagonistic interactions occurred in the coastal than in the continental zone.

Keywords: Sewage sludge; Biosolids; Metal interactions; Bioavailability; DTPA

* Corresponding author.