Ex-situ evaluation of bauxite residue as an amendment for trace metals stabilization in composted sediments

M.TANEEZ[1], C. HUREL[1]*, G. LEFEVRE[2] AND N. MARMIER[1]

[1]University of Nice -Sophia Antipolis, Faculty of Sciences, EA 4228 ECOMERS, Parc Valrose, 06108 Nice Cedex 02, France

[2]Institut de Recherche de Chimie de Paris - UMR8247 Chimie ParisTech – CNRS, France

(*correspondence: Charlotte.HUREL@unice.fr)

Stabilization of aquatic sediments contaminated with multi-elements is a challenging task in choosing the appropriate sorbent and application dosage. The present study investigated the possibility of using bauxite residue (bauxaline and bauxsol) as an amendment for the treatment of multi contaminated sediments. Adsorption experiments are carried out to determine the removal efficiency of solid and surface complexation modeling is used to model the adsorption data. The solids are subjected to CEC, XPS and BET analyses. 5% bauxaline and 5% bauxsol is used for the treatments of sediment to immobilize As, Cd, Cu, Mo, Ni, Cr and Zn. pH, ionic conductivity, temperature, and leached metal concentrations are measured regularly during the experiment. The results showed that after 3 months of treatment, Cd, Cu, Zn and Ni can be effectively immobilized but increased leaching of As, Cr and Mo is observed as compared to control. The leachates are then evaluated for acute toxicity using estuarine rotifers *Brachinous plicatilis*. Suitable treatment of bauxite residue can make it an effective choice for remediation in future.

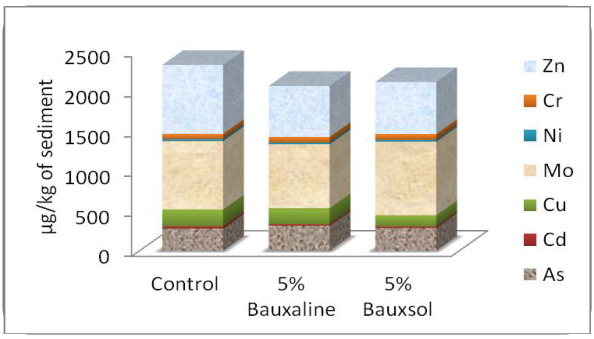

Fig.1. Total amounts of pollutants released after three months from control sample and stabilized sediments