



The mobility of heavy metals in mine tailings associated with polymetallic ore mining activities in the Eastern Carpathians, Romania

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Abstract

The present study was conducted on a series of 20 samples collected from the topstratum of seven mine tailings mounds and one mound of processed ore. The material studied is linked to the mineralization of polymetallic sulphide ore in the Tulgheș metamorphic unit (Eastern Carpathians, Romania). The aim of the study was to quantify the mobile fraction from each sample, for As, Co, Cr, Cu, Fe, Mn, Ni, Pb, Sn and Zn, as well as to investigate its correlation to the pH and Eh conditions within the topstratum. The initial pH and Eh, as well as the initial content, were measured for each sample; the latter was established using XRF. The leaching procedure was performed by means of acetic acid extraction – 0.1M for 1g of sample, while the concentrations of the elements within the extracts were measured using ICP–OES. The results indicate that As and Sn were the least mobile elements, while the highest mobility was found to have been that of Mn and Co. The highly acid environments increased the mobility of Fe and Cr, and decreased that of Pb. The mobility of Zn, Cu and Co was found to be correlated, as they formed a distinct group.

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