

Geochemistry of potentially toxic trace elements in soils of mining area: a case study from Zangezur Copper and Molybdenum Combine, Armenia

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Abstract

The primary aim of the study was the determination and evaluation of the impact of mining activity on soil pollution with application of various pollution indices. In this study we selected 8 zones basing on soil maps and marked 13 points for soil sampling. Soil samples were analyzed for heavy metals using Atomic-absorption spectrometer PG990. During the study 11 metals and nonmetals were analyzed and the greater quantities, as compared with control sample, were observed generally in case of copper and molybdenum. These data were obtained by means of both Contamination factors (*C_f*) and Geoaccumulation index (*I-geo*) during the testing of soil contamination level. The correlation analysis revealed the strongest positive correlation between Cu and Mo and that the high content of these two elements in soil is caused by human activities and the presence of a single pollution source. Contamination assessment based on Degree of contamination (*C_d*) showed, that the 58.4% of A horizon soil samples referred to a moderate degree of contamination, 8.3% - to a considerable degree and 33.3% - to a very high degree of contamination. Obtained results will be useful for implementation of control measures of pollution and the remediation techniques in the study area.

Keywords: heavy metals, soil contamination, Degree of contamination, Geoaccumulation index, Armenia

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