

## **Mobility indices for the evaluation of metal contamination in soils affected by mining activities**

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This work presents a methodology to assess the environmental potential risk of soils when submitted to different conditions. The potentially toxic elements (PTEs) behaviour was evaluated by single chemical extractions in order to simulate four conditions: PTEs leaching under actual rainfall conditions; acid mine drainage; an anoxic and an oxic environment. Soil pollution assessment was carried out using the contamination factor (CF) and the pollution load index (PLI) for total contents and indicators of mobility were established for each extraction: natural mobility indicator (NMI), acid mine drainage mobility indicator (AMI), oxic mobility indicator (OMI) and anoxic mobility indicator (ANMI).

The total PTEs content in samples was high, and this content decreased when the distance of the sampling site to the source of contamination increased. The results obtained after the extractions suggested that the highest PTEs content were extracted in the acidic medium. These results allow to suggest that acid mine drainage in the studied area is an important problem, especially in samples located close to the contamination sources, where soils could act as secondary contamination sources if they receive acidic waters. In addition, the complexing-medium results suggest that if in sediments close to contamination sources a change from oxidant to reducing conditions takes place, PTEs mobilisation could be an important issue.

The most reactive materials under oxic conditions are, in the study area, the most modern. The proposed indices may constitute a first attempt to define areas with high potential environmental risk, where urgent action is needed. In addition, the proposed methodology could be a valuable tool to prioritise these interventions.