



Risk assessment of the soil contamination caused by electrolytic zinc waste

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This communication addresses the possible risks posed to soils and sediments as a result of the waste obtained in a facility for the large-scale electrolytic production of zinc. This process is not as simple as it may seem at first sight, and the presence of massive quantities of soluble salts increases the hazard potential of these residues, mobilizing the potentially toxic elements (PTEs) and creating a potential carcinogenic risk for both children and adults.

To assess such a risk, differential X-Ray diffraction was used to study, in simulated environmental situations, the relevant role played by several mineralogical phases involved in the evolution of this particular type of waste . The natural and forced mobilisation of lead, cadmium and arsenic in the waste was studied with the purpose of establishing possible environmentally relevant damaging levels and associated risks in uncontrolled situations. The study of potential mobility showed that all the samples considered were susceptible of releasing a significant amount of PTEs depending on the particular environmental conditions. Two situations can be considered the most problematic: the natural mobilization of the released cadmium and zinc as a result of rain, and a change in the redox conditions caused by an anoxic environment (flooding and/or incorporation of organic matter). The compositional differences between the samples related to the antiquity and the type of industrial process used are not reflected in the calculations for the risk acceptability.