



## Do heavy metals existing in abandoned mining sites represent a real health risk? A study case in the SE Spain.

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Mining activities have been carried out for centuries in Sierra Minera (SE Spain) giving rise to a large number of sites distributed throughout the zone in which residues are accumulated. This communication reports studies as regards metal mobilization and analysis of the health risk that could be posed by inhalation, dermic contact or occasional ingestion of this type of sediments. Lead was used as the metal for the studies due to its particular abundance in the zone.

A large number of samples were taken and general analytical determinations (pH, particle size, organic matter, equivalent calcium carbonate content and mineralogical composition) were carried out in order its characterization. An *in vitro* method for obtaining formation on Pb bioaccessibility in these mine waste materials was also carried out.

Our results prove that mineral associations, different alteration states and sorption/desorption processes play an important role in the bioavailability of lead. In addition, it is noteworthy that the metal fraction dissolved by the proposed *in vitro* methodology is lower than 100%, both in the stomach and intestinal phases. Finally an assessment of the risk posed by lead is achieved. To this respect it should be noted that the IRIS database provide cancer slope factor and reference dose, as a way to assess the risk caused by arsenic, cadmium and copper but no for lead, probably due to the wide variety of real situations, and the discrepancy of the sources. The way here suggested is a novelty in this sense, and the results could be extrapolated to other similar zones and be incorporated to the general protocol of risk assessment applied to contaminated sites.