

EGU21-4850

<https://doi.org/10.5194/egusphere-egu21-4850>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Regional soil geochemistry for Sb and Hg in Guadalmez and Almadén synclines, South-Central Spain

Sofía Rivera Jurado¹, Saturnino Lorenzo¹, Carmelo Monsuy Minang Eyang¹, José María Esbrí Víctor¹, Eric Gloaguen², and Pablo Higuera¹

¹Universidad de Castilla-La Mancha (UCLM), Instituto de Geología Aplicada (IGeA), Spain (sofia.rivera@alu.uclm.es)

²Bureau de Recherches Géologiques et Minières, France

The geochemical similarities between Hg and Sb (along with W and As), have produced ore deposits in which both elements are present. In the present work we investigate the relationships between the Sb deposits of the Guadalmez synclinal and the Hg deposits of the Almadén synclinal, separated only 8 kilometres. To accomplish this purpose a regular sampling grid was used, locating samples in each square (4 km²) according to lithologic criteria. In total, 116 soil samples have been taken at two depths using an Ejkelkamp sampler. The samples have been taken in an area of around 100 m² around the set point at different depths, sample A at 2-15 cm and sample B at 15-30 cm. Each sample represents a composite sample of 3 subsamples taken at different but close locations, randomly chosen. The preparation of the samples has included drying at room temperature to avoid Hg losses, as well as its disaggregation and homogenization, prior to obtaining an aliquot of 100 grams that was ground in agate mortar until obtaining a grain size of less than 100 microns. The geochemical characterization of the samples included the analysis by energy dispersion X-ray fluorescence (EDXRF) to obtain the concentrations of major and trace elements. Total Hg data has obtained by means of Atomic Absorption Spectrometry using a Lumex equipment with a pyrolysis attachment. The distribution of Sb and Hg contents in the two synclines studied has not shown appreciable similarities. The highest concentrations of Sb have been found in the Guadalmez syncline, where the known mines of La Balanzona and Accesos are located. A particularly anomalous zone has been located in the southeaster zone of the Guadalmez synclinal, in the Ordovician age materials. Elevated Sb contents have also been found in the Almadén syncline, especially in the western zone without an observable predominance by lithology using a 4 km² grid size that could be less sensitive to scarce lithologies (e.g dykes). The Hg distribution, on the other hand, offers its maximum contents, as expected, in the Almadén syncline, particularly at the southeast part. Some anomalous Hg values have been found in Devonian materials of Guadalmez syncline. Concentrations of Cr and Ni are clearly related with the volcanic rocks of Almadén syncline, as well as with the presence of diabase intrusions in the Guadalmez syncline. Considering the age, a higher variability is observed in Hg contents than in Sb, especially in Devonian materials. Sb contents show little variability in general, but this is appreciable in the Ordovician materials of the Gualdamez syncline.

This work was funded by the ANR (ANR-19-MIN2-0002-01), the AEI (MICIU/AEI/REF.:

PCI2019-103779) and author's institutions in the framework of the ERA-MIN2 AUREOLE project, as well as by Project SBPLY/17/180501/000273, Consejería de Educación, Regional Government of Castilla-La Mancha, Spain.