Geophysical Research Abstracts
Vol. 14, EGU2012-10516-1, 2012
EGU General Assembly 2012

Biogeochemistry of tungsten in soils and tailings of mining areas (Northern Portugal)

P. Favas (1,3), J. Pratas (2,3), M.E.P. Gomes (1,3)

(1) University of Trás-os-Montes e Alto Douro, Department of Geology, Vila Real, Portugal (pjcf@utad.pt), (3) Geosciences Center, University of Coimbra, (2) University of Coimbra, Earth Sciences Department, Coimbra, Portugal

We compared five mining areas of Northern Portugal with distinctive paragenesis (Ervedosa Mine with cassiterite and diverse sulphides; Rio de Frades Mine and Regoufe Mine with wolframite, scheelite, cassiterite and sulphides; Adoria Mine with volframite, cassiterite and sulphides; and Tarouca Mine with scheelite, cassiterite and sulphides) for bioavailable levels of tungsten in soils and the resulting bioaccumulate levels in six species of plants (*Erica arborea L.*, *Halimium umbellatum (L.) Spach*, *Pinus pinaster Aiton*, *Pteridium aquilinum (L.) Kuhn*, *Pterospartum tridentatum (L.)* Willk. and *Quercus faginea Lam.*).

The mechanisms relating to the mobility and bioavailability of this metal have been explored using chemical extraction techniques. The procedure adopted in this study allows the separation of the water-soluble fraction, so the extracted chemical elements must be considered highly bioavailable because they are easily mobilised. The elements extracted from the so-called exchangeable fractions, which in this study were leached through the use of NH_4 OAc, are an important part of the potentially available elements and can be considered as an estimate of bioavailability.

Tungsten appears to be relatively immobile in most studied sites, but soils of Tarouca mine show significant increases in bioavailable fraction.

The soils of the Tarouca mine area stand out by their higher content of W in the bioavailable fraction. Probably as a result of easier fragmentation and dissolution of scheelite, compared to wolframite. This is reflected in the bioaccumulated concentrations in the tissues of the studied species at this site. It's in the samples of Tarouca mine that occur higher bioaccumulated levels of W than all five mines. This exemplifies the importance of soil mineralogy, controlling the biogeochemical distribution of elements.