

Geochemical characteristics of sulphide minerals from Albanian Cu-mineralisations and mine wastes

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The studied Cu-mineralisations and the related waste dumps are located in the Mirdita Ophiolite Zone of the Albanian Dinarides. Its rocks represent MOR (W) and SSZ (E) geotectonic environments of the Neotethys¹. The deposit of Puka-Kçira is located in the former, while that of Thirra is found in the latter zone.

The studied mineralisations are quartz-sulphide vein type copper deposits. Although they represent 20% of Albania's Cu reserves, their genesis is not clear and the ore minerals have not yet been examined with modern analytical methods. Therefore this study contains results of a wide range of analytical methods to understand the formation processes as well as environmental geochemical characteristics.

We analysed ore and host rock samples from outcrops and waste dumps. The texture of the ore deposits is stockwork in Thirra with chalcopyrite, pyrrhotite, cobaltite, pyrite, sphalerite, arsenopyrite and scorodite content. In contrast, the ore mineral assemblage is composed of chalcopyrite, pyrite and a minor amount of native tellurium, Ni- and Ag-Au-tellurides in Puka-Kçira, occurring in massive to disseminated texture. Mineral chemistry of pyrite, chalcopyrite as well as epidote suggests a VMS deep stockwork zone related origin and whole-rock geochemical analyses classify the deposits as mafic, Cyprus-type. Results of the above mentioned analyses mirror the different geotectonic positions (MOR vs SSZ): higher amount of Ag, As, Co and Zn is found in minerals of Thirra (SSZ), while Puka-Kçira (MOR) contains more Cr, Ni, V and Cu.

As the study areas locate also abandoned mines, this mineral geochemical study is essential to understand the environmental effects showing that weathering and drainage of mine wastes can release heavy and toxic metals, such as As, Cr, Co, Ni and Zn, besides the obvious Cu.

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¹Robertson, A. H. F., Shallo, M. (2000) *Tectonophysics* 316: 197–214