Li stream sediment geochemistry at Barroso pegmatite field (Portugal)

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Introduction

Barroso-Alvão pegmatite field has numerous veins, mostly composed by well mixed aplitic and pegmatitic parts (Charoy et al. 2001). According to Černý's classification, they are rareelement pegmatites of the LCT family and belonging to the complex type. Depending on the dominant lithiniferous phase, they are spodumene sub-type, lepidolite sub-type or petalite sub-type. These intrusive bodies occur in a metasedimentary host in rock of Ordovician-Silurian age. The surrounding area is closed by different granites, some are predominantly biotitic and others are two mica type.

Stream sediment geochemistry

This process has been used for the last fifty years with remarkable success in identifying areas of high mineral potential (Fletcher 1997).

Geochemistry prospecting was carried out by IGM during one year within a 227 Km² area. In this work 665 samples were collected that were analysed for the following elements: Li, W, Sn, Nb and Ta from a fraction lower than 80 mesh. With the obtained results various Li anomalous zones were defined, considering a background value for Li as 99 ppm.

In this study, these anomalous zones were overlapped in the updated pegmatite field geological map. Aware that stream sediment are representative of weathering and erosion products occurred upstream the collected samples, a geological exploration on the 1/10, 000 scale was carried out so that these lithium anomalies could be justified.

Conclusions

This simple methodology allowed the recognition of petalite-bearing pegmatite veins, justifying these lithium anomalies that were, until then, justified by spodumene and lepidolite mineralizations.

References

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Fault tectono-geochemistry and prognosis of concealed ores in the Tongchang Cu-Au polymetallic orefield, Shaanxi, China

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The Tongchang ore-field is located in the centre of the Mianxian-Lueyang-Yangpingguan area that is celebrated as a "gold triangle" area, at the juncture of the latitudinal tectonic zone of South Qinling, the Longmenshan Cathysian tectonic zone and the Sichuan-Yunnan longitudinal tectonic zone, where there are distributed Cu-Au polymetallic ore deposits (occurrences) including the Tongchang, Chenijaba. Qinjiabian, Yinshangou and Xiakouvi ore deposits (mineralization).

The samples were collected predominantly from the sections on the earth's surface in the orefield. 251 fault tectonite samples were collected, and each a sample weighs 1-2 kg. All samples were prepared for analysis by ICP-MS techniques (Qi L. et al., 2000) in the Institute of Geochemistry, CAS. 8 main factors of samples for R-mode factor analysis of 18 elements have been obtained: F₁: Pb, Ag, Mn, Zn, Sn; F₂: Cr, Ti with -Co and -Ni; F₃: As, Bi, Mo: F₄: Zr, Pb, Mo; F₅: Sn, Sr; F₆: Cu, Co; F₇: Ti, V; and F₈: -B, -Ba. In combining with the geological condition, the factor F_1 represents the long-range ore-forming element association of meso-epithermal ore-forming solutions; F₃, the element association of mesothermal gold mineralization; F₆, the of hyper-mesothermal Cu-Co element association mineralization. All these factors reflect the metallogenic features of Cu-Au polymetallic deposits in the Orefield.

Tectono-geochemical characteristics and prognosis of concealed ores: (1) Geochemical-anomalies are distributed by way of overlapping or being close to the known orebodies (mineralization), indicating that the anomalies represent the primary halos of orebodies and the areas where mineralization is concentrated;(2) In the Tongchang area, diorite appears the overlapping of meso-hyperthermal and mesothermal element anomalies; in the east and west contact zones of the diorite appears the overlapping or neighboring of hyper-, meso- and meso-epithermal mineralization anomalies, displaying a horizontal zonation.

Therefore, Tectono-geochemical characteristics provide the basis for the localization prognosis of concealed ores.

References

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