Adapted BLEG method in stream sediment geochemistry at Régua-Verin Structure (Portugal)

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Introduction

Régua-Verin Fault System is part of a major lineament that runs on a 020ºN trend from the Atlantic coast in central Portugal to the Bay of Biscay in Spain. Exploration in the Portuguese sector was carried out in this multiple braided strike-slip system within a corridor approximately 20km wide, by Minas Romanas (MR) in the late 90's. The gold mineralization occurs, in late to post kinematic quartz veins and stockworks, associated with arsenopyrite and pyrite.

Extensive alluvial, eluvial and coarse grained hard rock gold has been mined in the past. Romans produced more than 40 million ounces from northern Portugal and north west Spain (Harford et al. 1998).

BLEG stream sediment geochemistry

The aim of the use of Bulk Leach Extractable Gold (BLEG) in the geochemistry exploration program was to find the refractory, fine grained, invisible and covered gold deposits not exploited by the Romans.

Very large sample volumes were required (from 8 to 25kg) because in northern Portugal, samples are saturated by contrast with samples collected in western USA or Australia. Sample sites were chosen such that an average of 1 square kilometre of drainage was covered. In the field, every tenth sample was duplicated in order to check the reproducibility of the sample sites, the fines volume and the assay laboratory. Despite the low quantity of fines, the assay laboratory had difficulty with the fines and so leach solution volumes were changed in the laboratory.

Conclusions

The exploration by MR in northern Portugal has shown that BLEG is a successful technique for the delineation of both known and unknown gold mineralisations. These results show that BLEG sampling differentiates between coarse grained alluvial and eluvial gold in drainage systems and gold that has derived from refractory, fine grained, invisible and covered gold systems.

Reference

Harford P., Plimer I., Da Silva R. and Lima A.M.C., (1998), Minas Romanas Concession Annual Report, 41p.

Re-Os age for molybdenite from the Dexing porphyry Cu-Au deposit of Jiangxi Province, China

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The Dexing porphyry deposit including Tongchang, Fujiawu and Zhushahong deposit in northeastern Jiangxi Province of China is tectonically located in the eastern sector of the Mid-Proterozoic Jiangnan orogenic belt and occurs in Jiuling Terrane to the west of Northeast Jiangxi Deep Fault which represents the suture zone between the Juling Terrane and the Huaiyu Terrane. The Early Jurassic granodiorite porphyry stocks related to the deposit t are calc-alkaline and high in SiO_2 (60.81~66.25wt%), and show a narrow range in Na_2O+K_2O values (5.31~6.84wt%) These porphyries are enriched in Ba, Rb, Th, U, LREE, and chalcophile elements, depleted in Nb, Y and Yb, and have no obvious Eu anomaly. The SHRIMP zircon U-Pb ages of both the Fujiawu and the Tongchang porphyries are 171±3Ma (Wang et al.,2004).

Metallogenic epoch is very important to study on matallogenesis. But the formation age of the Dexing deposit have been not exactly defined. The aim of this paper is to date the highly precise Re-Os age for molybdenite from the deposit and to give constraint on an exact age of ore formation for the deposit. The eight molybdenite samples analyzed in this study were separated from the Tongchang deposit. The eight samples give a good ^{187}Re-^{187}Os isochron. The ^{187}Re-^{187}Os isochron age is 170.4±1.8Ma (MSWD=0.40). This age represents the age of Cu-Au mineralization of the Dexing deposit and is remarkably consistent with that of the Tongchang porphyry, suggesting that the formation of the Cu-Au ores is genetically related to magmatism. Cu isotope study also indicated the copper was derived from the magmatic rocks (Lu et al., 2004). The time interval between the metallogenic age and the formation age of the porphyry is little, suggesting that the mineralization occurred rapidly after emplacement of the porphyry magma.

This work was financially supported by Natural Science Foundation of China (No.40373025) and the Major State Basic Research Program of China (No.1999043209).

References

Lu J.J., Hua R.M. and Jiang S.Y. et al.,(2004), Geochimica et Cosmochimica Acta. 11S, A302.

Wang Q., Zhao Z.H. and Jian P. et al., (2004), Acta Petrologica Sinica.2, 315-324.