5.3.P24

Study on the genesis of Kanggur gold deposit, NW China

W. CHEN[1,2], Y.T. WANG[3], Y. ZHANG[2] AND C.M. HAN[4]

[1] Institute of Geology and Geophysics, CAS, Beijing 100029, China (chenwenf@public3.bta.net.cn)
[2] Institute of Geology, Chinese Academy of Geological Science, Beijing 100037, China (zhangyan@cags.net.cn)
[3] Institute of Mineral Resources, Chinese Academy of Geological Science, Beijing 100029, China (wyt69@263.net)
[4] Institute of High-Energy Physics, CAS, Beijing 100039, China (chunminghan@263.net)

Introduction

The Kanggur gold deposit, located in the northern margin of Tarim plate, NW China, outcrops in the middle part of Quigemingtashi-Huangshan ductile shear zone, so it is, in the long time, considered to be the gold deposit of shear zone type. To inspect whether the above opinion is correct, we dated the relative rocks in Qiugemingtashi –Huangshan ductile shear zone and Kanggur gold deposit.

RESULTS AND DISCUSSION

Five ore samples are collected from the different parts of the well of No. Kanggur gold deposit vein. The K-Ar ages of the whole-rocks are from 290.1Ma to 286.4Ma. These ages are in accordance with the whole-rock Rb-Sr isochron ages of 290±5Ma of Aqishan Formation altered andesite, the ore mineral Sm-Nd isochron ages of 290.4±7.2Ma and Rb-Sr isochron ages of 282.3±5Ma of the fluid fragment contained in quartz. Therefore, we tend to interpret the ages of 290.1Ma-282.3Ma as the ages of the gold metallization.

Five mylonites are collected from the surrounding rock of Kanggur gold deposit. Two a little deformed samples of them show the ages of 236.6±3.8Ma and 231.5±3.6Ma respectively and the other three strongly deformed samples show the accordance ages of 224.8±3.5Ma, 225.7±6.7Ma and 224.8±3.7Ma. the K-Ar ages of ~225Ma is the youngest estimated value of cooling to 300 from 500 for the shear deformation. The above dating results show that the time of the shear deformation in Qiugemingtashi –Huangshan ductile shear zone is later than the time of the gold metallization.

Conclusions

The preliminary geochronology study indicates that the metallogenic epoch is discordant with the deformation age. If the metallization is considered to occur in Heicynian period, ductile shear deformation occurred in the later period is not the key factor of Kanggur gold deposit metallization and it is also limited on the alteration of the gold deposit. Therefore, Kanggur gold deposit is not that of shear zone type.

Acknowledgements

The work was supported by the National Key Basic Research Project of China (No 2001CB409807).

5.3.P25

Sorting out the variable roles of subduction and contamination in the generation of Late Archean alkaline intrusions, western Superior Province

B. LASSEN

Department of Earth Sciences, University of Ottawa, Ottawa, Canada (blassen@science.uottawa.ca)

Late Archean igneous activity within the Quetico metasedimentary belt in the western Superior Province produced a chemically diverse alkaline rock suite. U-Pb ages range between 2683 and 2678 Ma. The intrusions include a wide range of rock types, which display arc-like trace element patterns with strong large ion lithophile element (LILE) and light rare earth element (LREE) enrichment ([La/Yb]N = 5 – 90) and variable high field strength element (HFSE) and heavy rare earth element (HREE) depletions ([Dy/Yb]N = 1.2 – 3.3). Nd and Hf isotope ratios suggest derivation from a depleted mantle source, but Pb-Pb isotope ratios are largely crustal in composition and reflect either input from a subduction-modified mantle source formed by fluid transport of sediment Pb into the mantle wedge or contribution from an older crustal source.

The occurrence of near primary melt compositions provides a window on source compositions and conditions of melting and allows resolution of the effects of crustal contamination and subduction processes. The most primitive samples can be modeled by partial melting of a primitive mantle source mixed with 0.5% subduction component in the garnet-spinel transition zone. Evolved samples have undergone contamination with the surrounding country rocks, but simple bulk mixing models cannot generate the observed trace element variations and mixing models involving variable degrees of melting of the country rocks are incorporated to explain the range in data.

The source region is evaluated with respect to mineralogy and types of metasomatizing agents. Time-integrated depleted Nd isotope signatures suggest that the metasomatic event occurred not long before melting. Superchondritic Nb/Ta is attributed to metasomatism by silicic melts that have left rutile in the residue and the metasomatic agent appears to be a mixture of slab-derived fluids and melts.