

Geology and geochemistry of the Lincang superlarge Germanium deposit hosted in coal seams, Yunnan, China

RUIZHONG HU, HUAWEN QI, XIANWU BI,
WENCHAO SU AND JIANTANG PENG

State Key Laboratory of Ore Deposit Geochemistry, Institute of Geochemistry, Chinese Academy of Sciences, Guiyang, China (huruizhong@vip.gyig.ac.cn)

The Lincang germanium deposit, with ca. 1000 t germanium reserve, is one of the largest Ge deposits hosted in coal seams in the world. The deposit located in the Tertiary fault-controlled Bangmai coal-bearing basin, Lincang county, western Yunnan province of China. Strata in the basin can be divided into three coal-bearing cycles (N_{1b}^2 , N_{1b}^4 , N_{1b}^6). Coal seams in N_{1b}^2 are interbedded with siliceous rocks and clastic rocks, while coal seams in N_{1b}^4 and N_{1b}^6 are only interlayered with clastic rocks. The rocks in basement of the basin are granite, with average Ge content of 3.9 ppm which is much higher than the Clack value (1.4 ppm) of the equivalent rocks.

The Ge of the deposit occurs in the coal seams interlayered with siliceous rocks in N_{1b}^2 . Orebodies have equant or elongated configurations and mainly distributed at fault intersections. Ge in mineralized coal seams is mainly combined with and partially absorbed by organic matters, and appears to be concentrated at the top and bottom of coal seams where they mainly contact with siliceous rocks.

In this work, detail geological and geochemical research on the deposit has been done. A new model to link the formation of the deposit to surrounding rocks is proposed. The model suggests that: (1) the siliceous rocks interlayered with mineralized coal seams are hydrothermal in origin, (2) the sites of fault intersections are possibly the access channels of Ge-bearing hydrothermal fluids from which the interlayered siliceous rocks deposits, (3) the Ge in Ge-bearing hydrothermal fluids is derived from the Ge-enriched granite, and (4) the organic matters in coal seams presents an ideal barrier for germanium.

This work was supported by the Chinese Academy of Sciences Innovational Program (KZCX3-SW -125).