

RESEARCH ON METALLOGENETIC THERMAL HISTORY OF XIAYINGFANG GOLD DEPOSIT, EASTERN CHINA, BY FISSION TRACK METHOD

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Xiayingfang gold ore district occurs in Yanshan platform fold belt of eastern Yinshan-Yanshan EW tectonic belt. A granite-porphyry intrusion is close related to the gold mineralizing process. The rock body outcrops about 0.65 km². Both rhyolite-porphyry and magma breccia distribute outside the granite-porphyry. There are strong alterations of quartz-sericitization, potassium feldspathization and veinlet silicification. The quartz-sericitization is prevalent and is stronger in upper part of the body than in the deep. The gold deposits generally occur in inner and contact zone of the granite-porphyry and associate with quartz-sericitization. The measured fission track ages of both zircon and apatite range from 153.9 Ma to 103.3 Ma, indicating a more than 50 Ma metallogenetic duration. The age data and quantitative modelling of apatite fission track show that there are two stages of gold mineralization, in which the first stage is of higher temperature and cooling rate than the second stage and the turning point between them is about time 120 Ma and temperature 100°. The first stage of mineralization results from the intrusion of granite-porphyry and take place in about 150 Ma, and second stage of mineralization is related to both rhyolite-porphyry and magma cryptoexplosive breccia and occurs in about 135 Ma. Combined with the mineralogenetic temperature of 370°, 290°, 230°, 170° and 150°-80° in early-, main- and late-mineralization period respectively, the fission track ages of zircon and apatite correspond to the main- and late-mineralization period separately.