Geochemical characteristics of granites and their relationship to gold mineralization in Yangshan gold deposit, Gansu Province, China

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Yangshan gold deposit, hosted in the Devonian stratum on the north margin of Bikou Terrane, western Qinling orogenic belt, is a super-large carlin-like gold deposit discovered recently in Gansu Province,China. Many granitic dikes were found in the deposit and had spatially relationhsip to gold ore bodies. But the genetic relationship between them is still controversial. Studies show that the SiO_2,K_2O and Al_2O_3 of the granites range from 60.64% to 80.77%,2.27% to 4.32% and 11.83% to 23.71% respectively,and the A/CNK varies from 1.24 to 4.29,which indicate the granites are belong to prealuminous,calc-alkaline.The Granites are also enriched in Cs,U,K,Pb , and depleted in Ba,Nb,La,Ce,Sr,Ti. Rare earth elements (REE) content of the granites is between 14.45×10^{-6} and 143.14×10^{-6}(average 70.31×10^{-6}),with La_N/Yb_N ratios of 1.48- 37.26(average 17.08). Light rare earth elements (LREE) are concentrated evidently and heavy rare earth elements (HREE) are deficient with LREE/HREE ratios of 1.39-19.52(average 10.12).The REE patterns are characterized by slightly negative Eu anomalies,withδEu=0.50-1.21(average 0.77). Combining with the analytical data of the major and trace elements, geochronology and Sm/Nd, Rb/Sr and Pb isotope of Yangshan granites,Bikou group volcanic rock and Devonian Sanhekou section stratum from previous work,it is proposed that the granites were derived from partial melting of deep thickening crust(Bikou group volcanic rock) and mixed with Devonian stratum during ascent.That is to say that the ore-forming material of Yangshan gold deposit directly derived from granitic magma,and the Bikou group volcanic rock and Devonian stratum should be the primary source.

Source of fluid during continental subduction and exhumation: *In situ* LA-ICP-MS analysis of Sr-isotope in barite of eclogite from the Sulu UHP terrane, eastern China

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Barite occurs as an fluid-bearing mineral in eclogite cores distributed at 0-3000 m depth intervals of the main-hole of the Chinese Continental Scientific Drilling (CCSD) in the Sulu UHP terrane. Based on the petrographic features, barite can be divided into three types, including as inclusions of garnet at the peak ultrahigh-pressure (UHP) metamorphic stage, and as matrix mineral at the early retrogressive eclogite-facies stage and the late retrogressive amphibolites-facies stage. Its formation was genetically associated with fluid activity and metamrphic P-T conditions. This study introduces a new method of *in situ* $^{87}Sr/^{86}Sr$ analyses on the barite grains by LA-ICP-MS, and obtains three groups of Sr-isotope ratios related to the different metamorphic stage. The analyzed results show that $^{87}Sr/^{86}Sr$ ratios of barite is about ~0.7050, ~0.7067 and 0.7080~0.7125 for the peak UHP metamorphic stage, the early retrogressive eclogite-facies and the late amphibolites-facies stage, respectively, and display an increase trend from UHP metamorphism until late retrogression. This evolutional characteristics of $^{87}Sr/^{86}Sr$ ratios reveal the genetic information of fluid activity during UHP metamorphism and late retrogression. Thereinto, the fluid was mainly a mixed phase from mantle and crust source during the continental subduction, then more external crustal fluid was added during the early exhumation, and finally external crustal fluid became the dominant source when the Sulu UHP terrane was exhumed to the upper crust level.

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