

THE POSSIBILITY OF PROSPECTING SUPERLARGE QUARTZ-CARBONATE GOLD DEPOSIT IN SINO-KOREAN ARCHEAN CRATON

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The gold deposits in Archean greenstone belts are most important gold resources in the world. Quartz-carbonate gold deposits are important components of gold deposits in Archean greenstone belts, they were emplaced in shear zones at or above the brittle-ductile transition. Some of the largest deposits are known to have formed along major long-lived transcurrent shear zones. One of the most constant features of quartz-carbonate gold lodes is carbonate alteration, which may extend kilometres away from major deposits. Their ^{13}C signature is consistent with a mantle source for the CO_2 . They formed chiefly in late Archean time, 2.5-2.9 Ga, with huge reserves.

Sino-Korean Archean craton was not very stable, its greenstone belts were smaller and with higher grade metamorphism. The Zhangjiakou gold mine is a typical quartz-carbonate gold deposit in China, lies within the high-rank metamorphic greenstone belt in north margin of Sino-Korean Archean craton. In field investigation, we discovered that ferroan dolomite alteration with a mass of gold, replaced early gold-quartz vein and mylonite, and formed rich gold lode. The gold-bearing ferroan dolomite in the mine has average $\delta^{13}\text{C}$ of -4.13% , its Pb-Pb isochron age is $2,711 \pm 238$ Ma. After the geological and geophysical exploration in south area of the mine, we found an IP anomaly in depth of 350-450m, more than 8 km^2 , where a 2.85m thick gold ore body has been revealed in first drill hole, average grade is 1.3g/t, highest in 4.8g/t. We believe a large rich gold deposit will be determined by more drilling holes.