

## **Geochemistry of gold mineralization in the Muping-Rushan gold belt, Jiaodong Peninsula, China**

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The Jiaodong Peninsula produces 25 percent of the gold in China and the genetic classification of the deposits remains controversial. Many researchers would classify the gold deposits in Jiaodong as orogenic type, but differences exist in many aspects such as the metallogeny background, mineralization age, and mineral assemblages between ores of the Jiaodong Peninsula and typical orogenic gold deposits. Thus the Jiaodong-type gold deposit theory was established mainly based on the gold deposits in northwestern Jiaodong Peninsula.

The Muping-Rushan gold belt is one of the most important gold belts in the eastern part of the Jiaodong Peninsula and is situated in the Sulu orogen, which was effected by subduction of the Yangtze Plate and Pacific Plate before the main gold event. Gold deposits are mainly hosted in the Late Jurassic Kunyushan monzogranite and controlled by a NNE brittle fault and NW secondary fault. During the mineralization, the faults showed sinistral and extensional movements. The orebodies are mainly the quartz-sulfide vein type and have steep dip angles. The alteration types include K-feldspar, sericite-quartz, pyrite-sericite-quartz, and silification. Pyrite, sphalerite, galena, and chalcopyrite are the main metallic minerals. Free gold mainly occurs in the fractures of quartz and pyrite.

Compared to the gold deposits in northwestern Jiaodong Peninsula, differences occur in some aspects. Gold deposits in eastern Jiaodong Peninsula formed later than those in northwestern Jiaodong Peninsula, with the youngest mineralization ages reported in the Muping-Rushan gold belt. Within the Muping-Rushan gold belt, gold deposits in the west have older mineralization ages than those in the east. The free gold and invisible gold precipitated due to different mechanisms. Fluid unmixing in quartz-sulfide vein type gold deposits is an important free gold precipitation mechanism in northwestern Jiaodong Peninsula, but doesn't apply to the Muping-Rushan gold belt. Fluid unmixing may have happened but prior to the mineralization event. Fluid-rock reaction may be one important mechanism to explain how free gold precipitated within Muping-Rushan gold belt. The invisible gold precipitation is involved with surface absorption by pyrite grains. If reactivation of refractory gold did happen, the invisible gold in the pyrite could only account for a very few percent of the total free gold.

Similar to the gold deposits in northwestern Jiaodong Peninsula, the ore fluid in Muping-Rushan gold belt may have been derived from dehydration of the subducting Pacific slab, and the ore material may come from the lower crust and enriched mantle wedge. Within the Muping-Rushan gold belt, ore material derived from the Phanerozoic Jingshan Group wallrocks may be excluded based upon the fractionated sulfur isotope composition.