

The Relationship Between Chert and Gold Orebody in Micro-Disseminated Gold Deposits, China

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Chert widely occurs in the sediment-hosted micro-disseminated gold deposits, China. The cherts are characterized by bedded, laminated, massived and pseudobrecciated structures which change regularly in space. The thickness of a chert bed generally varies from several meters to 200 meters. Host elements are simple and concentrated in the cherts. Besides SiO_2 (96.30% on average), only Fe_2O_3 and FeO reach 1.0%, respectively. The mean ratio of $\text{Al}/(\text{Al}+\text{Fe}+\text{Mn})$ in all chert samples is much lower than 0.35. In Fe/Ti vs. $\text{Al}/(\text{Al}+\text{Fe}+\text{Mn})$ diagram and $\text{Al}-\text{Fe}-\text{Mn}$ diagram, most of the chert samples fall in the hydrothermal field. REEs are characterized by a low content, negative Ce anomaly and a gradually increasing NASC-normalized value with increasing atomic number of REEs. The $\delta^{18}\text{O}$ values of the cherts range from 12.6‰ to 23.24, and the $\delta^{30}\text{Si}$ range from -0.7‰ to 0.8‰. All geological and geochemical characteristics of the cherts show that the chert is product of submarine exhalative sedimentation.

In the light of the relationship between gold orebodies and cherts, gold orebodies occur in cherts, or in the upper of cherts, or in upper rocks of the cherts. Because of the affinity between SiO_2 and gold, gold was rapidly enriched in cherts and then chert-type gold ores were formed, such ores include the famous Laerma, Banqi and Getang gold deposits. In generally, there is no gold orebodies in the early stage of chert sedimentation. With the deposition of SiO_2 , the stability of $[\text{AuH}_3\text{SiO}_4]^0$ complex in hydrothermal was decomposed, leading to the precipitation of hydrothermal gold. Therefore, gold was generally enriched in the upper of cherts or in upper rocks of the cherts. Such a typical sample is Yanshang gold deposit.