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A Study of Mineralogy of Pyrite and Au Mineralization in Micro-Disseminated Gold Deposit in Southwest Guizhou, China

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The micro-disseminated gold deposit in Southwest Guizhou is a typical medium-low temperature hydrothermal deposit while the strata-bounded nature of Au mineralization hasn't been clearly understood. We analyze the morphology, composition and distribution of pyrite and the occurrence of Au of the Shuiyindong gold deposit through mineralogy, petrography, EPMA, ESEM and other high-precision in-situ test methods. The results indicate that there are at least three types of pyrite: coarse, fine and framboidal pyrite. The coarse pyrite has a regular core and 2-3 outer part of the secondary enlarged ring belt, which the elements such as S, As and Au show an annular distribution, indicating that the inner and outer zones were formed in different hydrothermal metallogenic stages. The fine pyrite is mostly symbiotic with arsenopyrite and has high content of Au and As. The framboidal pyrite is filled in the biological skeleton (Ty1) and microfracture (Ty2) as aggregates, which is closely associated with organic matter and almost contains no Au and As.

Gold occurs as invisible ions or atoms in lattice or as native micron particles. The former mainly exists in As-rich fine pyrite and the enlarged ring of coarse pyrite while the latter are distributed in vugs, microcracks of the host rock, pyrite, or organic matter, showing typical fracture-controlling characteristics.

The above research on the pyrite shows that this type of gold deposit has the characteristics of multiple overprinting of hydrothermal activities. Furthermore, the structures may provide a conduit for hydrothermal migration while the coexisting of abundant bioclasts in the orebody may play an important role in the strata-bound characteristics of micro-disseminated gold deposit.