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Pyrite textures and compositions from the Qiucun Au deposit, Dehua-Youxi-Yongtai ore district, SE China: implication for ore-forming processes

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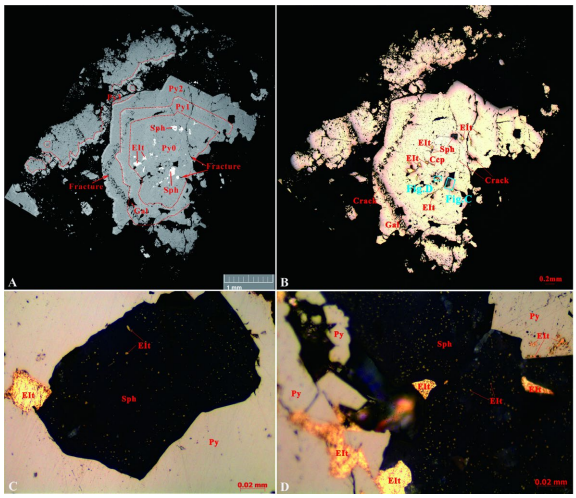

The Qiucun Au Deposit is a typical low-sulfidation epithermal gold deposit in central Fujian Province, with pyrite as the main ore mineral. Pyrite is favourable for deciphering hydrothermal and ore-forming processes. Based on optical characteristics, BSE observation and NanoSIMS mapping, four generations of zoned pyrite was determined, including the pyrite with Nos. of 2, 1, and 0 at an early stage and Pyrite 3 at the main ore-forming stage. Among them, Pyrite 0 is irregular and has low concentrations of As, Sb, Au, Ag, Pb, Zn, and Cu. Pyrite 1 precipitated with Pyrite 0 and shows oscillatory zoning, of which the slightly bright edges have high content of As, Ag, Sb, and Cu while the dark bands have low content of As, Au, Ag, Pb, Zn, and Cu. Pyrite 2 precipitated with Pyrite 1 and also shows oscillatory zoning, of which the bright edges have high content of As, Au, Ag, Sb, Cu, Pb, and Zn. The oscillatory zoning represents the separation of fluid phase with ore-forming elements that occurred around the crystals of Pyrite 1. Pyrite 3 is on the edge of Pyrite 2 and along cracks of pyrite that occurs with sphalerite, galena, chalcopyrite, and electrum. The pyrite was likely crushed due to a tectonic-magmatic event and then Au-rich hydrothermal fluids filled into its cracks. The $\delta^{34}S$ values of the pyrite suggest a magmatic sulfur source. The Rb-Sr geochronological age of the epithermal pyrite from adjacent Donghua is 153.7 ± 2.4 Ma[1], and the Re-Os isochron age of the molybdenite in adjacent Qiucheng Mo Deposit is 150.8 ± 1.6 Ma[2], suggesting that the gold metallogenic event was coincident with the tectonic-magmatic event around 150 Ma that is related to the subduction of the Pacific Plate.

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References

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