

Late Jurassic Epithermal Ag-Au Mineralization in Southeast Coastal China: Evidence from U-Pb Dating of Hydrothermal Monazite at the Dongji Deposit

Lina Yi¹, Xianwu Bi¹, Ming-Liang Huang¹, Wei Gao¹, Yanwen Tang¹, Xingchun Zhang¹

¹Institute of Geochemistry Chinese Academy of Science, Guiyang, China

The Southeast Coastal Metallogenic Belt of China is extensively covered by Yanshanian volcanic rocks and hosts numerous epithermal Ag-Au deposits, the ages of which remain highly controversy. This severely hinders understanding of ore genesis and the relationship between regional mineralization events and geodynamic settings. The Dongji Ag-Au deposit (Au: 12.5 t, 4.27 g/t) in the Zhenghe ore district of Fujian province is a typical epithermal Ag-Au deposit hosted within quartz porphyry. In this study, hydrothermal monazite intergrowing intimately with Au-bearing pyrites, which is distinctly different from sparsely distributed magmatic monazite, was identified for the first time in typical ore samples from the 170-m level of the Dongji deposit. In-situ U-Pb isotopic dating of this hydrothermal monazite was performed using Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS) with a beam diameter of 10 μm . The analyses yielded a high-precision, low-dispersion weighted mean U-Pb age of 150.5 ± 1.7 Ma ($n = 28$, MSWD = 0.30). This age is indistinguishable, within analytical error, from the formation age of the host quartz porphyry (154 ± 2 Ma, indicating that the mineralization is genetically linked to the emplacement of the quartz porphyry intrusion. This result constrains the main mineralization age of the Dongji Ag-Au deposit to the Late Jurassic (~ 150 Ma), which is distinct from the known Early Cretaceous epithermal mineralization event (e.g., Zijinshan, ~ 100 Ma) and probably defines a new Late Jurassic Ag-Au mineralization event in the Southeast Coastal Metallogenic Belt of China. This discovery provides crucial new chronological constraints on regional epithermal mineralization and their genetic linkage to concealed porphyry Cu systems in Southeast China.