

Origin of the giant South China Mesozoic low-temperature metallogenic domain

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Low-temperature metallogenesis in a huge area is very special in the world. The giant South China low-temperature metallogenic domain (SCLTMD) covers an area of around 500,000 km² in the southwestern Yangtze Block in South China, and is composed of the Chuan-Dian-Qian Pb-Zn, Youjiang Au-As-Sb-Hg and Xiangzhong Sb-Au metallogenic provinces. The SCLTMD hosts numerous Carlin-type gold deposits, MVT Pb-Zn deposits and vein-type Sb, Hg and As deposits, which were hosted by sedimentary rocks, formed under low temperature conditions (~100-250 °C) and controlled by fault and fracture systems. Recent studies have shown that the deposits formed dominantly at 200-230 Ma and 130-160 Ma, corresponding to Indosinian (Triassic) and Yanshanian (Jurassic to Cretaceous) orogenies, respectively. Indosinian mineralization is recognized in all three provinces, but Yanshanian mineralization occurred only in the Youjiang and Xiangzhong provinces. The Indosinian orogeny, which involved collision of the Indochina Block with the South China Craton, resulted in circulation of basinal brines that leached ore-forming elements from adjacent sedimentary strata to form the Chuan-Dian-Qian Pb-Zn province. Deep-seated granitic magmas generated during this orogeny caused extensive circulation of meteoric water that mobilized ore-forming elements from the sedimentary strata to form the Carlin-type Au deposits in the Youjiang province, and the Sb-Au deposits in the Xiangzhong province. The Indosinian orogeny was the key factor in establishing the metallogenic framework of the SCLTMD. The Yanshanian metallogeny was less important and overprinted the Youjiang and Xiangzhong provinces.