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## A Cretaceous granite-related stratiform Cu ore hosted in Triassic basalt, SW China

Zhang, J.W.<sup>1</sup>, Dai, C.G.<sup>1</sup>, Tao, P.<sup>1</sup> and Huang, Z.L.<sup>2</sup>

<sup>1</sup>Guizhou Geological Survey, Bureau of Geology and Mineral Exploration and Development of Guizhou Province, Guiyang 550005, China

<sup>2</sup>State Key Laboratory of Ore Deposit Geochemistry, Institute of Geochemistry, Chinese Academy of Sciences, Guiyang 550081, China

Gejiu is one of the largest tin-polymetallic districts in the world and contains approximately 3 million tons (Mt) of Sn and smaller quantities of Cu, Pb, and Zn. The deposit primarily yields three different types of ore: skarn-hosted ore, basalt-hosted stratiform ore, and carbonate-hosted stratiform ore. Kafang is one of the primary ore deposits in the Gejiu district and is an unusual occurrence hosted in basaltic rocks. Genetic models of the Kafang deposit suggest that it is related either to Anisian (Lower stage of Middle Triassic) Gejiu basalts <sup>[1]</sup> or to Cretaceous Gejiu granite <sup>[2]</sup>.

The trace element ratios of the Gejiu basalts are similar to those of ocean island basalt and have positive  $\epsilon\text{Nd}(t)$  values (ranging from 0.6 to 2.5) and uniform  $(87\text{Sr}/86\text{Sr})_i$  values (ranging from 0.70424 to 0.70488). These ratios are close to those of the Permian Emeishan flood basalt. Thus, the Gejiu basalts may represent coeval volcanisms within the plate involving remelting of the Emeishan plume head through a stress relaxation process after the main plume event.

Our study shows the SIMS zircon U–Pb analyses of the Gejiu basalts yield an age of 244.4 Ma. However, the hydrothermal alteration (85.5–81.9 Ma) <sup>[3]</sup> and the Cu mineralization (84.2–79.6 Ma) <sup>[4, 5]</sup> of the basalts are temporally related to the Cretaceous granite (85.5–83.3 Ma) <sup>[2]</sup>. Based on Pb and S isotopic composition studies, the Gejiu basalts provide ore-forming materials to the Kafang stratiform Cu deposit. The high amounts of K and Mg in the Gejiu basalts can be attributed to hydrothermal alteration, with the granite being the source of K and the wall-rock dolomite being the source of Mg. The Gejiu basalts differ from the basalts that host typical VMS deposits, and thus the Kafang stratiform Cu deposit was formed by Cretaceous granite-related hydrothermal processes.



Figure 1: Outcrop of the Kafang stratiform Cu ore body.

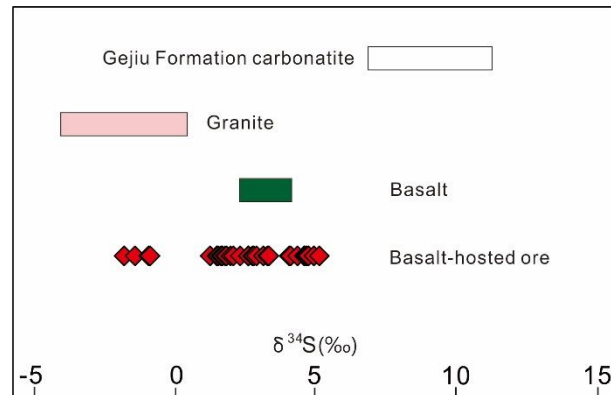


Figure 2: S isotope distribution of the different units of the Kafang stratiform Cu deposit

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