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## Geological and Geochemical Characterization of the Chifumbazi Gold Prospect, Irumide Belt, Tete Province, Northern Mozambique

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The Chifumbazi gold prospect is located in the northwestern part of Tete province, Mozambique. The prospect lies on a northern terrane of Tete Province which is underlain by supra-crustal volcano-sedimentary rocks of the Mualázi Group in the Southern Irumide Belt. Although Mozambique has been geologically mapped on a 1:250 000 scale, gold mineralization studies are lacking in Tete Province. This study aims to describe the gold mineralization and associated hydrothermal alteration in the Chifumbazi prospect, based on petrography, whole-rock geochemistry, and sulfur isotope data.

The mineralization, in the Chifumbazi prospect, occurs as carbonate-quartz-chlorite, quartz, and chlorite veins and veinlets and, sometimes, disseminated in gneiss and meta-granodiorite host rocks. However, the mineralized veins and veinlets occur along with the discordant fracture system within a Pan African shear zone. The meta-granodiorite consists mainly of plagioclase, biotite, hornblende, and quartz, with secondary calcite, dolomite, sericite, and chlorite; while the gneiss is composed of quartz, biotite, and opaque minerals. Hydrothermal calcite, chlorite, and sericite occur either as small veins and veinlets or as replacing primary minerals. Furthermore, the meta-granodiorite shows enrichment in LREE, depletion in HREE, and a negative Eu anomaly.

The ore minerals in the Chifumbazi prospect consist mainly of pyrite, pyrrhotite, chalcopyrite, and minor covellite, galena, magnetite, and bornite. Visible gold was not observed, however, gold contents up to 5 ppm were detected by inductively coupled plasma mass spectrometry. Thus, we suggest that gold in the Chifumbazi prospect occurs as a solid solution in sulfides.

The  $\delta^{34}\text{S}_{\text{CDT}}$  of pyrite and chalcopyrite varies in a narrow range, between +1.1 and +2.9 ‰, suggesting a restricted source of sulfur, which could be magmatic or metamorphic in origin.

Based on geological setting, mineralogy, alterations, and sulfur isotope signatures, the Chifumbazi gold mineralization can be classified as an orogenic-type gold deposit.