

Geology and geochemistry of the Chifumbazi and Mugomo gold prospects, Tete province, Mozambique

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The Chifumbazi and Mugomo Au prospects are located in the northwestern part of Tete province^[1,2]. The studied areas belong to the southern Irumide Belt consisting of the Proterozoic Mualadzi Group and the Furancungo Suite^[1,3]. Gold mineralization of the Chifumbazi and Mugomo prospects has not been characterized yet and the processes of mineralization are still unresolved. Thus, this study aims to characterize the geology, gold mineralization and related hydrothermal alteration based on petrography, geochemical, fluid inclusion and sulfur isotope analyses of the host rocks, veins and ore minerals.

The host rocks of the Mugomo prospect are metavolcanic rocks, schist and silicified rocks cross-cut by quartz veins and epidote veins and veinlets. Pyrite, chalcopyrite, sphalerite, galena and bornite with minor Ag-Te and Bi-Te minerals occur within the quartz-epidote veins, as well as dissemination in the metavolcanic and silicified rocks.

The Chifumbazi prospect is characterized by carbonate quartz-chlorite and quartz veins hosted in granodiorite. Pyrite, chalcopyrite, arsenopyrite, pyrrhotite and bornite with minor sphalerite, covellite, galena and magnetite, occur both in the chlorite, quartz and carbonate-quartz veins and as dissemination in the granodiorite. The mineralization is related to the shear zone associated to a fracture system in different directions. The quartz veins are sub-horizontal, but in some cases, they dip to the south.

The metavolcanic rocks and schist at the Mugomo prospect were altered to quartz, chlorite and epidote, while the granodiorite at the Chifumbazi prospect was altered to illite, calcite and chlorite. Significant Au concentration was measured in the metavolcanic rocks in the Mugomo prospect (2 ppm) and in the quartz-carbonate veins in the Chifumbazi prospect (5 ppm). Sulfur isotopic compositions of sulfides in the Mugomo prospect ($\delta^{34}\text{S} = +2.5$ to $+4.0$ ‰) are slightly higher than those in the Chifumbazi prospect ($\delta^{34}\text{S} = +1.0$ to $+2.5$ ‰).

Keywords: Chifumbazi and Mugomo prospects, hydrothermal alteration, Gold, sulfur isotope