

AU/AG RATIO VARIATIONS AT MINA III AND MINA NOVA GOLD DEPOSITS, CRIXÁS GREENSTONE BELT, CENTRAL BRAZIL

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Mina III and Mina Nova gold deposits occur in the transition between metabasic volcanic rocks and chemical and detrital metasedimentary rocks of the archaean Crixás greenstone belt. Mina III presents three main mineralized zones: the Upper Ore Zone (UOZ: massive sulfide lenses within Fe-dolomitic marbles and Fe and Al-rich rocks); the Lower Ore Zone (LOZ: both a concordant quartz vein and a sulfide-bearing carbonaceous schist); and the Garnet Ore Zone (GOZ: concordant quartz veins within chlorite-garnet schist). At Mina Nova, two main ore zones occur: the Ore Body 1 (OB1: sulfide-bearing carbonaceous schist, in a similar way of LOZ), and the Ore Body 2 (OB2: carbonate-muscovite schist lenses within carbonaceous schist). Mineralogical characterization of the ore bodies indicates gold association at UOZ preferably with pyrrhotite and arsenopyrite, and less often with carbonate, chalcopyrite, quartz, micas and oxides; at LOZ preferably with quartz, carbonaceous matter and arsenopyrite, and less frequently with carbonate, pyrrhotite and micas; at GOZ, mainly with quartz, micas and arsenopyrite, and more rarely with chalcopyrite and oxides; at OB1 with arsenopyrite, pyrrhotite and carbonate; and at OB2 with carbonate, muscovite and arsenopyrite. Microprobe analysis in individual gold grains of all ore zones indicates very low values of other elements and Au/Ag ratio variations intimately associated with host minerals or associated mineral phases of each ore zone, suggesting that initial Au/Ag ratios in source-rocks, transport (sulfide and chloro complexes) and deposition mechanisms (fluid-rock interactions and fluid immiscibility) may have had great importance in the observed chemical variations.