

Maria Lázara gold deposit (Goiás State, Brazil): An example of intense fluid/rock interaction associated with a triple point structure

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ABSTRACT : Since 1970, the Crixás region has been the aim of important gold exploration targets. The Maria Lázara gold deposit is one of the more recently exploited ore fields, and shows structural, mineralogical and geochemical features which reveal keys to the gold mineralization processes in the Guarinos greenstone belt. These include the remarkable Au-Bi-Te-S mineral association characterized by the uncommon geothermometer gold + maldonite, and the link between shear zone deformation processes in greenstone belts and local ballooning strain fields which result in the development of transtension zones providing sites for gold concentration.

1 GEOLOGICAL SETTING

The Maria Lázara gold deposit is situated in the Guarinos greenstone belt 45 km from Crixás city (Goiás, Brazil). The Archean volcano-sedimentary formation of the Guarinos forms a belt about 40 km long and 6 km wide, stretching in a NW-SE direction (Saboia & al 1979). It comprises a komatiite and metabasalt sequences with intercalations of metapelites, bifs, orthoquartzites and carbonaceous phyllites.

Maria Lázara gold mineralization is restricted to mylonitized metabasalts which mark the tectonic contact between the Guarinos greenstone belt and the granite-gneissic Moquem block. The shear zone evolution process is marked by the intrusion of successive granitoid rocks of variable dimensions. The Guarinos dome is one such syntectonic trondhjemitic intrusion emplaced during the regional transcurrent shear zone system

chloritization, biotitization, sericitization, sulphidization and tourmalinization alteration processes.

2 TIMING OF THE MINERALIZATION

The Maria Lázara gold deposit occurs into a triple point structure (Brun & Pons 1981) developed by the Guarinos trondhjemitic intrusion during a wrench deformation (Pulz 1990). The Guarinos dome is elongated parallel to the stretching lineation of the shear zone and the regional foliation is often parallel to pluton boundaries. The long x axis of the strain ellipsoid is sub-horizontal in almost all the shear zone, except in a small zone in which gold mineralization was deposited, on the inner side of the triple point where the x axis shows a rake of 60°-70°S. This deposit is epigenetic and gold deposition is synchronous with shear zone

Additionally, higher finite strains expressed by C-C' fabrics in intense hydrothermal alteration halos, compared with S and S-C foliations in less altered zones, also require a synchronism between the hydrothermal fluid circulation and shear zone deformation.

3 STYLES OF MINERALIZATION

Gold-bismuth-tellurium disseminated mineralization of the Maria Lázara deposit is found in : (i) hydrothermal alteration halos (potassic and sericitic zones) (ii) quartz-carbonate veins (iii) albite-carbonate veins. Irregular zoning, abun-

5 DISCUSSION

At the regional scale, the intrusion of the synkinematic Guarinos dome, during the evolution of the transcurrent shear zone permitted the development of a triple point structure favourable for intense fluid-rock interaction.

At the gold district scale, the occurrence of small trondhjemitic dykes transformed into albite-carbonate veins, and the association of gold with a Bi-Te-S-As-B-P-Mo paragenesis within a potassic and sericitic alteration zone, suggests that these magmatic intrusions played a notable contribution in ore genesis.