

## **GOLD METALLOGENESIS OF THE EASTERN PART OF THE BORBOREMA PROVINCE, NORTHEASTERN BRAZIL**

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Structurally hosted gold deposits of high grade and low tonnage are common in greenschist-amphibolite facies metamorphic terranes of the Borborema Province, Northeastern Brazil. They consist of vein systems confined to second-order structures related to the shear zone of the Patos/Pernambuco Lineament and were formed during the Brazilian/Pan-African event (~600 Ma). In the province, these deposits are hosted by any type of lithology, with an ore assemblage composed mainly of pyrite, pyrrhotite and chalcopyrite. Locality, galena (mica schist), arsenopyrite (orthogneiss) and bismuthinite (skarn rocks) are important phases, and in some deposits gold appears associated with Fe-Ti oxides and Fe-garnet-bearing veins. The mineralizing fluids comprise low salinity H<sub>2</sub>O-CO<sub>2</sub>-H<sub>2</sub>S solutions which, except for H<sub>2</sub>S, show the same composition of the regional metamorphic fluid. Mass balance analyses reveal that iron, together with the components of the different sulfides, Cu, Bi, As, Pb, were yielded by the hydrothermal alteration of the host rocks. The gold mineralizing processes in the Borborema Province are associated with the establishment of convection cells within the shear planes, caused by the thermal anisotropy created by the Brazilian granitic intrusions. In this context, the gold Clark content would be dissolved by H<sub>2</sub>O-CO<sub>2</sub>-H<sub>2</sub>S fluids from a large volume of deformed rocks in the lower level of the cells and, subsequently, precipitated together with sulfides, along small volumes of high grade, cigar-shaped ore shoots. Gold precipitation from thiocomplexes may have been caused by a decrease in fluid sulfur activity, as a consequence of the availability of iron in the fluid liberated by the hydrothermal alteration of the host rocks, causing the precipitation of iron sulphides.