

GOLD-BEARING AND BARREN VEINS OF THE NOVA XAVANTINA REGION, MATO GROSSO STATE, CENTRAL BRAZIL: A COMPARATIVE FLUID INCLUSION STUDY

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The Nova Xavantina region is one the most important gold district in the easternmost sector of the Mato Grosso State. This region comprises a Neoproterozoic low-grade volcano-sedimentary sequence which has been correlated to the Cuiabá Group in the Araguaia Belt. It is composed, from bottom to top, of mafic to intermediate volcanics, with interlayered chemical sediments (BIF's and cherts), and clastic sediments.

The volcano-sedimentary sequence is crosscut by a series of fault/fracture systems, which are generally filled with meter-wide gold-bearing and barren quartz veins. The gold-producing veins are particularly those hosted by mafic volcanics and BIF's, with associated carbonaceous phyllites, and which are found enclosed in an ENE-WSW ductile-brittle dextral shear zone. These auriferous veins contain significant amounts of base metal sulfides (pyrite, sphalerite, galena, chalcopyrite and bornite) and comprise the major lode-gold systems of the Garimpo dos Araés deposit.

Petrographic, microthermometric, and laser Raman micro-spectroscopic studies identified two main types of fluid inclusions in the investigated auriferous and barren quartz veins: low-salinity (2-4 eq.wt%NaCl) H₂O-CO₂ inclusions, and low-salinity (<3 eq.wt%NaCl) H₂O inclusions. Important differences regarding the mode of occurrence and temperature-composition data for these inclusion fluids in the auriferous and barren veins include: (1) populations of H₂O-CO₂ fluid inclusions are much more abundant than populations of H₂O inclusions in the mineralized veins, whereas the latter dominates over the former in the barren veins; (2) N₂-CH₄ are generally present in subordinate amounts

(<10 mol%) in the H₂O-CO₂ inclusions (lowest TCO₂-melting= -58.7°C) of the mineralized veins; whereas in the barren veins they are generally absent; (3) although the range of total homogenization temperature, in the liquid state, is similar for the H₂O-CO₂ inclusions in both types of veins (T_{ht}= 300-347°C), the H₂O inclusions of the mineralized veins display a higher range of values (T_{ht}= 274-287°C) than in the barren veins (T_{ht}= 215-258°C).

On the basis of this comparative study, it is concluded that a fluid regime dominated by a low-salinity CO₂-rich aqueous fluid, at T= 300-350°C and P= 3 kb, was of fundamental importance to the transport and deposition of the gold and base metal sulfides at the Garimpo dos Araés deposit. The deposition of the metal may have occurred in response to reduction-driven reactions during fluid-carbonaceous matter interaction (decrease in (O₂), and/or fluid immiscibility (decrease in (S₂). The mineralizing H₂O-CO₂ fluids are interpreted as deep-seated sourced, probably of metamorphic origin. A magmatic contribution cannot be discarded, however it seems unlikely, since the closest granitic intrusion is located 150 km away from the deposit.

Taking into account that veins formed under the influence of an aqueous-dominated regime are generally barren, the fluid inclusion characteristics may also be considered as an additional factor in assessing potential gold-bearing lodes in the Nova Xavantina region.

HIDROTERMALISMO E INCLUSÕES FLUIDAS NA SUÍTE VILA NOVA NA SERRA DO IPITINGA (NOROESTE DO ESTADO DO PARÁ)

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Doze tipos de inclusões (com subtipos) são identificados nas rochas da Suíte Vila Nova, com a caracterização de dois sistemas de fluidos, relacionados a três eventos hidrotermais peculiares. As rochas ricas em quartzo-clorita, hospedeiras da mineralização sulfetada, contêm onze tipos, havendo todavia oito tipos que lhes são exclusivos, permitindo considerá-las resultantes da primeira ação de fluidos, relacionada ao primeiro evento hidrotermal. Essas rochas foram afetadas por um sistema de fluidos aquo-carbônico heterogêneo, constituído principalmente por CH₄ e H₂O e traços de N₂ e H₂S. O CO₂ é muito subordinado em relação ao CH₄, ocorrendo com traços de CH₄, H₂S e N₂. Apenas em um tipo de inclusão ele ocorre puro. Um sistema de fluidos aquosos salinos, com salinidades diferentes e temperaturas decrescentes, relacionado ao cisalhamento regional, também afetou essas rochas. A predominância do CH₄ sobre o CO₂ no sistema de fluido aquo-carbônico é condizente com modelos aceitos para

geração de depósitos hidrotermais sindeposicionais, em ambiente submarino exalativo. Além disso, os estudos acerca da origem do metano apontam a abiogênese como a principal fonte desse fluido em sistemas hidrotermais de alta temperatura das dorsais meso-oceânicas, nas quais o metano é derivado da própria rocha. Assim, a existência de inclusões de metano nas rochas a quartzo-clorita reforça a caracterização do evento M1 como um processo metamórfico/hidrotermal de fundo oceânico, bem como sugere um ambiente semelhante aos dos atuais centros de expansão oceânica, para geração dessas rochas, ao mesmo tempo que as caracteriza como basaltos hidrotermalizados. As isócoras de CH₄ e o intervalo de 250°C - 450°C considerado para geração das rochas a quartzo-clorita, permitiram admitir intervalos de pressões de 0,7kb a 2,3kb para a geração da mineralização sulfetada.