SEG 2024 Conference: Sustainable Mineral Exploration and Development

Morphochemical and Isotopic Analysis (δ65Cu) of Gold from the Serra Dourada and Bananal Placer Deposits in the Aguapeí Belt, Southwest of the Amazonian Craton, Brazil

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And understanding of the composition of gold and its morphochemical evolution in supergene environment is important for the development of prospecting techniques for new deposits. In in this work, we study the morphochemical and isotopic footprint ($\delta^{65}Cu$) of gold from the Serra Dourada (SD-primary) and Bananal placer (BP-alluvial) deposits. The latter formed after the erosion and transport of gold from SD. In both deposits, the core of the gold (Au1) is formed by a ternary alloy of Au-Ag-Cu, with variable composition and isotopic footprint ($\delta^{65}Cu$), divided into 3 geochemical groups: SDG, composed of $Au_{99-100}Ag_{0-0.1}Cu_{0-0.1}$-($\delta^{65}Cu$ = + 0.30%), formed by SD crystals, and groups BG1 and BG2, formed by BP nuggets, with compositions $Au_{98-99}Ag_{1-2}Cu_{0-0.03}$-($\delta^{65}Cu$ = + 0.10%) and $Au_{87-99}Ag_{1-13}Cu_{0-0.17}$-($\delta^{65}Cu$ = - 1.45%), respectively. These values are typical of hypogene gold and indicate a compositional and isotopic zoning of the primary deposit. In addition to Au1, the BP nuggets contain golds Au2 and Au3, which exhibit high purity (aprox. 100% Au wt) and signs of leaching (Au2), dissolution (Au3) and reprecipitation (Au3), result of the chemical refinement of gold in supergene environments. Morphologically, the size of gold in SD and BP varies between 1 and 11 mm and comprises 3 morphological populations. SDP, formed by SD crystals, exhibits primary morphologies. In BP the nuggets comprise two morphological groups differentiated by the contrast the degree of morphological maturity of the nuggets, caused by different transport conditions. BP1 is formed by nuggets with primary morphological features. BP2 is formed by rounded nuggets. The mean values of the flatness index related to the transport distance Cailleux Flatness Index y Shilo are 2.11-1.11 and 2.67-1.67 for BP1 and BP2. These values suggest a transport distance between 2 and 4 km from their source, consistent with the distance between SD and BP.