OVERVIEW ON THE METALLOGENESIS OF THE CHROMITE DEPOSIT AND NI-CU-PGE MINERALIZATION OF THE JACURICI COMPLEX (SÃO FRANCISCO CRATON)

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The Jacurici Complex, located in the NE of the São Francisco Craton, hosts the largest chromite deposit in Brazil. The mineralized intrusion is considered as a single N-S Paleoproterozoic conolith-type elongated layered body disrupted into many segments by subsequent deformation. The Jacurici Complex also hosts Ni-Cu sulfide mineralization, in the northern part, and PGE mineralization associated to the chromite ore. Four segments located along the belt have been studied: Ipueira, Medrado, Monte Alegre and Várzea do Macaco. Here we integrate all results and discuss the magma chamber process that could explain the formation of the deposit. All segments have a similar stratigraphic succession with an ultramafic zone (250 m thick) that host a 5 to 8 m thick main chromitite layer (MCL) and a mafic zone (40 m thick). The chromite composition of the MCL is similar to those from other thick chromitites and to chromite from chromitites hosted in large igneous complexes such as Bushveld, Stillwater and Great Dyke. The parental magma was very primitive based on olivine (up to Fo_{93}) and orthopyroxene (up to En_{94}) composition and originated from an old subcontinental lithosphere. Os and Nd isotopes suggest that crustal contamination have occurred near to the MCL interval. Mineral inclusions in chromite from the MCL show evidences of H_2O and CO_2 enriched magma during ore formation. Chromite also hosts base metal sulfides and PGM, including laurite that can occur as isolated or as composite inclusions. The association of laurite with base metal sulphides and also the presence of hydrous and CO_2-rich minerals enclosed in chromite could suggest contamination and S-saturation previous or simultaneous to chromite crystallization. Our new findings support crustal contamination as a trigger for the ore crystallization and that fluids may have favored chromite crystallization. However, the anomalous thickness of the chromitite is a difficult feature to explain considering it is hosted in a very thin layered mafic-ultramafic body. The petrologic evolution suggests that a high volume of magma flowed through the sill. We considered a combined model where the chromite crystallized along the margins of a conduit triggered by crustal contamination, producing a semi-consolidated chromite slurry that slumped forming a thick chromitite. Although a connection to a much larger igneous system is assumed, the petrological and tectonic significance of this Paleoproterozoic magmatism and its precise regional geological correlation still require further investigation.

KEY-WORDS: THICK CHROMITITE; NI-CU AND PGE MINERALIZATION; CRUSTAL CONTAMINATION