



51º CONGRESSO BRASILEIRO DE  
**GEOLOGIA**

**13 A 17 DE OUTUBRO DE 2024**  
**BELO HORIZONTE - MG**

Centerminas Expo

**ANAIIS**



**ID do trabalho:** 1318

**Área Técnica do trabalho:** TEMA 19 - Magmatismo e Processos Petrogenéticos

**Título do Trabalho:** Xenocryst clues to compositional architecture of the Mantle and Diamond Potential of the Pântano Intrusion (MG), Alto Paranaíba Igneous Province

**Forma de apresentação:** Oral

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**Resumo do trabalho:**

Kimberlites are hybrid igneous rocks of mantle-derived origin, characterized by ultrabasic composition and high volatile content. The hybrid rock consists of three main phases: (1) xenoliths and xenocrysts captured by the kimberlitic magma during its ascension, (2) minerals crystallized from the magma itself, and (3) minerals formed from hydrothermal events. The Pântano kimberlite intrusion, located in Alto Paranaíba Igneous Province – SW of the São Francisco Craton, has already been the subject of petrological studies regarding crustal contamination processes during its magma evolution, but there are still few works about its mantle source. The present study focused on the composition (major, minor and trace elements) of mantle xenocrysts (garnet, clinopyroxene, ilmenite, spinel, and phlogopite), which contributes significantly to the understanding of the petrogenesis of this enigmatic rock. Our main objective is to evaluate the vertical heterogeneities and metasomatic signatures of the mantle column sampled by the kimberlite conduit and the diamondiferous potential of the Pântano intrusion. Clinopyroxene and garnet xenocrysts are mainly from garnet Iherzolites and, to a lesser extent, from eclogite/pyroxenite sources. Clinopyroxene trace element signatures present a normal concave downward pattern, being enriched in light rare earth elements (LREE) and gradually more depleted in heavy rare earth elements (HREE). From the distribution of rare earth elements in garnet populations, it is possible to identify that some of them have a sinusoidal pattern, which typically indicates metasomatic enrichment processes, where light rare earth elements are enriched compared to heavy ones. Furthermore, it can also be suggested that the metasomatic agent had silicate compositions (melt-derived) and the mantle in which the garnet was formed is mainly depleted. The presence of phlogopite xenocrysts mantled by kimberlite-cognate phlogopite confirms that the mantle sampled by the kimberlitic body underwent some metasomatic process. Picro-ilmenite crystals are surrounded by perovskite coronas, but they are within the field of those typically hosted in kimberlites. Regarding intensive parameters, the garnet xenocrysts from Pântano present a temperature range between 815 and 1180 °C, which, when projected in the local geotherm of 39 mW/m<sup>2</sup>, corresponds to depths between 100 and 170 km. This P-T range allow us to say that the Pântano intrusion sampled mantle materials in the diamond stability field and presents at least some potential for exploration.

**Palavras-Chave do trabalho:** Alto Paranaíba Igneous Province; kimberlites; Mantle xenocryst; Pântano;