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Abstract title

FLUID INCLUSIONS IN GRANULITES AND RETROMETAMORPHIC P-T-T PATHS FOR THE JUIZ DE FORA COMPLEX, SOUTHEASTERN BRAZIL

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Abstract

Fluid inclusion analyses in granulitic rocks are presented as an important source for relevant petrogenetic data for the study of the metamorphic evolution of the Juiz de Fora Tectonic Domain (DTJF) - Ribeira Belt, in the southwest Juiz de Fora (MG) region. The area is characterized by an intense "mixing" between basement units, composed by hornblende gneisses and orthogranulites of the Juiz de Fora Complex, and metasedimentary units, correlated to the Andrelândia Group.

The fluid inclusions are typical of granulite facies, as they consist of 81 to 93% CO₂ with moderate densities, varying between 0.79 and 0.94 g/cm³, for the basement rocks; and 92 to 100% CO₂, and moderate to high densities varying from 0.916 to 1.068 g/cm³ for the metasediments of DTJF.

The fluids associated to basement rocks have shown that the latest formed inclusions (trails) present systematically higher densities than the earlier ones (isolated), pointing to a near isobaric cooling retrometamorphic path, during the Transamazonian Event.

The likely P-T-t path for the Andrelândia Group supracrustal rocks, defined by a pattern of progressive lowering in inclusion densities (from D2-phase to D4-phase associated samples), indicates a more significant decrease in pressure than temperature after the metamorphic peak, suggesting an isothermal decompression situation, with a clockwise P-T-t path for the Brasiliano Event.

The available data for structural domains where basement rocks prevail indicate that the granulite facies metamorphism can be related to a Transamazonian extensional tectonic event, associated to magmatic intra and underplating, providing CO₂-rich fluids derived from mafic rocks and the necessary excess heat to the older granulite metamorphism (4-6kb/800-850oC).

During the Brasiliano, the collisional event that generated the Ribeira Belt caused intense anatexis that possibly removed large amounts of H₂O from the system, leading the metasediments to reach granulite facies metamorphism during the Brasiliano Event, with temperatures not higher than 800oC and pressures between 6-7 kb.

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