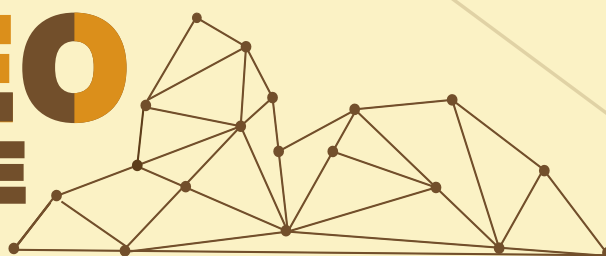


17° GEO SUDESTE

Rio, outubro-2023



Conectando Geociências e Sociedade

08 a 11 de outubro de 2023 - Rio de Janeiro - RJ

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CONTINENTAL SUBDUCTION AND EXHUMATION OF DEEP CRUST: EVIDENCES FROM THE POUSO ALTO NAPPE HP-(U)HT GRANULITE, SE BRAZIL

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The Southern Brasília Orogen (SBO), localized in southeast Brazil, is one of the orogenic belts that evolved during the Gondwana supercontinent assembly, and the Pouso Alto Nappe (PAN) is part of its orogenic wedge hinterland. The PAN is mainly constituted by a K-feldspar-garnet-kyanite-rutile-bearing paragneiss, interpreted as being a residual HP-granulite. A study was addressed to the PAN granulite combining detailed textural and microstructural observations with monazite petrochronology, thermodynamic modeling, and trace elements thermometry. By integrating these data, we were able to reconstruct the PAN granulite P-T-t trajectory and reveals a complex history of orogen evolution during the continental collision, which took place in the deep crust. The results reveal that the prograde subsolidus metamorphic conditions took place between ca. 670 and 620 Ma. Later, the PAN granulite underwent undersaturated-water partial melting during heating and burial achieving peak conditions of ca. 1000°C and 18-19 kbar at a maximum age of ca. 620 Ma. The retrograde path evolved from a continuous cooling and decompression, in which the final melt crystallization, at P-T conditions of ca. 820°C and 11 kbar, took place at ca. 590 Ma. Our P-T data indicate that likely the Pouso Alto granulite is a witness of the continental subduction and reached crustal depths of ca. 70 km, corresponding to the interface between lower crust and lithospheric mantle, in a double thickened crust. It is suggested that the granulite facies metamorphism was attained by combining heat production elements accumulation and mantle heat flow. The exhumation and cooling of the melt-weakened material are thought to be onset after delamination of denser material of the subduction conduit toward the mantle. Consecutively, the previous melt-weakened granulite onset its flow outward, likely driven by the gravitational force. Lastly, it is suggested that the PAN granulite could record the transition from a wedge-shaped orogenic belt to an orogenic plateau during the continental collision development.

PALAVRAS-CHAVE: SOUTHERN BRASÍLIA OROGEN, LOWER CRUST, HP-(U)HT METAMORPHISM, DUCTILE FLOW, MONAZITE PETROCHRONOLOGY