



## NEOPROTEROZOIC GRANITIC MAGMATISM IN A LOWER TO MIDDLE CRUST SECTION (NAPPE SOCORRO-GUAXUPÉ, SE BRAZIL): AGE PROGRESSION AND CRUSTAL ZONALITY EVIDENCED BY Sr-Nd-Hf ISOTOPY

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**RESUMO:** The Socorro-Guaxupé Nappe (SGN) is a highly metamorphic allochthonous terrane in southeast Brazil, believed to be a segment of a Late Neoproterozoic magmatic arc formed along the active margin of a continental plate. The nappe exposes more than 20 km of crustal section, consisting of granulites, migmatites, and charnockites in its lower portions (around ~8-10 kbar), and migmatitic para and orthogneisses intruded by younger Neoproterozoic granites (630–580 Ma) in the upper portions (around ~4-5 kbar). The U-Pb zircon SHRIMP and LA-ICP-MS dating of the entire (meta)-plutonic rocks from the Socorro Domain (southern segment of the SGN) reveals an age progression, starting from various types of charnockites and orthogneisses (650-640 Ma) intruding the lower granulites, to the ~620-610 Ma voluminous Socorro Batholith. The Socorro Batholith mainly consists of high-K calc-alkaline (HKCA) porphyritic biotite-hornblende granitoids with intermediate SiO<sub>2</sub> contents (60-68 wt%) and intrudes the middle to upper part of the crustal section (Al-in hornblende emplacement pressures ~5-6 kbar). Anatectic granites derived from para- and orthogneisses from the upper section indicate two main episodes of crustal melting at 625 and ~605 Ma, representing the final stages of syn-orogenic magmatism. Subsequently, ~580 Ma post-orogenic A-type granites intrude the southern part of the Socorro Domain and are related to the orogen collapse. A significant decrease in  $\epsilon_{\text{Ndt}}$  values, from -4 to -6 in the older and deeper orthogneisses and charnockites to  $\epsilon_{\text{Ndt}} < -12$  in the shallower HKCA granitoids, correlates with the age decrease. These changes in isotopic signatures suggest an upward propagating magma column with an increasing contribution from ancient continental crust sources at shallower levels, while deeper portions are formed predominantly by juvenile material. Additionally, new in situ Pb isotope analyses of alkali feldspar are being used to better understand the sources of this granitic magmatism and to differentiate the crustal reservoirs involved.

**PALAVRAS-CHAVE:** SOCORRO-GUAXUPÉ NAPPE, U-PB DATING, ZIRCON, HIGH-K CALC-ALKALINE GRANITES, ISOTOPIC GEOCHEMISTRY