

# **Petrogenesis and tectonic environment of Neoproterozoic calc-alkaline magmatism in the southern portion of Socorro-Guaxupé Nappe: comparative study of pre-collisional orthogneisses and post-collisional granitoids**

BÁRBARA BUENO TOLEDO<sup>1</sup>, VALDECIR DE ASSIS  
JANASI<sup>2</sup>, MAX W. SCHMIDT<sup>3</sup> AND ANTONIO CARLOS  
VASCONCELLOS<sup>4</sup>

<sup>1</sup>Geoscience Institute - University of Sao Paulo

<sup>2</sup>Instituto de Geociências - Universidade de São Paulo

<sup>3</sup>ETH Zürich

<sup>4</sup>Independent consultant

Presenting Author: [barbara.btoledo@usp.br](mailto:barbara.btoledo@usp.br)

The Socorro-Guaxupé Nappe (SGN) is a high-metamorphic grade allochthonous terrane in southeast Brazil, interpreted as a segment of a Late Neoproterozoic magmatic arc developed at the active margin of a continental plate. It exposes over 20 km of a crustal section, with granulites, migmatites and charnockites in its basal portions (at ~8-10 kbar) and migmatitic para and orthogneisses intruded by younger Neoproterozoic (630–580 Ma) granites in the upper portions (at ~4-5 kbar). U-Pb zircon SHRIMP and LA-ICP-MS dating of the whole set of (meta)-plutonic rocks from the Socorro Domain (southern segment of the SGN) reveal an age progression from diverse types of charnockites and orthogneisses (650-640 Ma) intrusive in the lower granulites to the ~620-610 Ma voluminous Socorro Batholith, dominated by high-K calc-alkaline (HKCA) porphyritic biotite-hornblende granitoids of intermediate SiO<sub>2</sub> contents (60-68 wt%), which intruded 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 reveal two main episodes of crustal melting at 625 and ~605 Ma, and mark the last episode of syn-orogenic magmatism; ~580 Ma post-orogenic A-type granites intrude the southern part of the Socorro Domain are related to orogen collapse. A remarkable decrease of eNdt from -4 to -6 in the older and deeper orthogneisses and charnockites to the shallower HKCA granitoids (eNdt < -12) correlates with the age decrease. This is suggestive of an upward propagating magma column that incorporated partial melts from rocks with older crustal residence the middle and upper portions of the SGN crustal section.