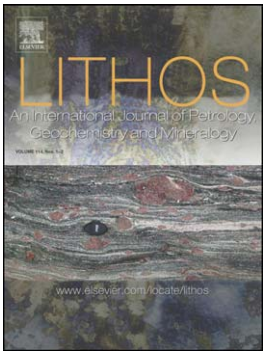


# Timing of anatexis and melt crystallization in the Socorro-Guaxupé Nappe, SE Brazil: insights from trace element composition of zircon, monazite and garnet coupled to U–Pb geochronology

B.C. Rocha, R. Moraes, A. Möller, C.R. Cioffi, M.J. Jercinovic

PII: S0024-4937(16)30105-0
DOI: doi: 10.1016/j.lithos.2016.05.020
Reference: LITHOS 3938

To appear in: *LITHOS*

Received date: 8 January 2016
Revised date: 15 April 2016
Accepted date: 27 May 2016

Please cite this article as: Rocha, B.C., Moraes, R., Möller, A., Cioffi, C.R., Jercinovic, M.J., Timing of anatexis and melt crystallization in the Socorro-Guaxupé Nappe, SE Brazil: insights from trace element composition of zircon, monazite and garnet coupled to U–Pb geochronology, *LITHOS* (2016), doi: 10.1016/j.lithos.2016.05.020

# Timing of anatexis and melt crystallization in the Socorro-Guaxupé Nappe, SE Brazil: insights from trace element composition of zircon, monazite and garnet coupled to U-Pb geochronology

*B.C. Rocha [a,b*], R. Moraes [a], A. Möller [b], C.R. Cioffi [a,b], M.J. Jercinovic [c]*

[a]*Departamento de Mineralogia e Petrologia, Instituto de Geociências, Universidade de São Paulo, Rua do Lago, 562, CEP 05508-080, São Paulo, SP, Brazil*

[b]*Department of Geology, The University of Kansas, 2335 Irving Hill Road, Nichols Hall, Lawrence, KS, 66045-7559, USA*

[c]*Department of Geosciences, University of Massachusetts, 611 North Pleasant Street, Amherst, MA, 01003-9297, USA*

* Corresponding author: brendaroch@yahoo.com.br



## ABSTRACT

The timing of partial melting and melt crystallization in granulite facies rocks of the Socorro-Guaxupé Nappe (SGN), Brazil is constrained using a combination of imaging techniques, LA-ICP-MS and EPMA dating, trace element geochemistry and thermobarometry. (Orthopyroxene)-garnet-bearing migmatite that records extensive biotite dehydration melting shows evidence for a clockwise P-T-t path. UHT peak conditions were attained at 1030 ± 110 °C, 11.7 ± 1.4 kbar, with post-peak cooling to 865 ± 38 °C, 8.9 ± 0.8 kbar. Cryogenian igneous inheritance of *ca*. 720-640 Ma is identified in oscillatory zoned zircon cores (n=167) with steep HREE patterns. Resorbed, Y-rich monazite cores preserve a prograde growth stage at 631±4 Ma prior to the partial melting event, providing an upper age limit for the granulite facies metamorphism in the SGN. REE-rich, Th-depleted monazite related to apatite records the initial