



KINEMATICS, NATURE OF DEFORMATION AND TECTONIC SETTING OF THE TAXAQUARA SHEAR ZONE, A MAJOR TRANSPRESSIONAL ZONE OF THE RIBEIRA BELT (SE BRAZIL)

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RESUMO: In this paper we have investigated the Taxaquara Shear Zone (TSZ), a major strike-slip structure within the Ribeira Belt (RB, SE Brazil) in order to assess its kinematics, the nature of deformation of rocks affected by the TSZ and its tectonic setting. The TSZ presents a vertical NE-trending mylonitic foliation and ENE- to WSW stretching lineation with variable plunge. Granitic rocks are intensely deformed giving rise to mylonites with newformed matrix assemblage (quartz + oligoclase + K-feldspar + biotite + muscovite + rutile + magnetite). This assemblage within a pseudosection couple with muscovite-biotite thermometer helps to constrain a metamorphic condition during deformation which spans ~513–525 °C and ~3.9–4.4 kbar with mean peak at ~520 °C and ~4.0 kbar. Quartz accommodates deformation through dislocation creep achieving subgrain rotation with minor contribution of grain boundary migration at a mean strain rate of 10^{-13} – 10^{-12} s⁻¹. Feldspar porphyroclasts record brittle deformation (microfaults) and evidences of dislocation creep (e.g., kink twinning). The CPOs for monomineralic quartz ribbons display monoclinic pattern and activation of 'basal- $\langle a \rangle$ ' + 'rhom- $\langle a \rangle$ ' slip systems during deformation. However, the CPOs for quartz and feldspar from fine-grained polyphase matrix show a switch in deformation mechanism from dislocation creep to diffusion creep. The vorticity and three-dimensional finite strain data results suggest that the TSZ was developed under a moderate to high strain conditions and a transpressional sub-simple shear environment, with predominance of simple over pure shear. Regional correlation with other structures from the Ribeira Belt and African Belts based on finite strain quantification support that a major transpressional system was mainly responsible for the shear zones development during late stages of Brazilian-Pan African orogeny.

PALAVRAS CHAVE: Ribeira belt; Shear zones; Transpression; Microphysical analyses; Quartz and feldspar CPO; Thermodynamic modelling