MICROSTRUCTURES, LATTICE PREFERRED ORIENTATION AND DEFORMATION MECHANISMS IN GRANULITE-MYLONITES FROM THE RIBEIRA BELT, SOUTHEASTERN BRAZIL

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In the northern domain of the Ribeira Belt, the NE-trending Além Paraíba shear zone (APSZ) is a main transcurrent fault zone that formed in response to transpressional during the Neoproterozoic orogeny. Deformation in the APSZ started under granulite facies conditions (0.6-0.7 GPa, 680-700°C). Mylonites microstructure is therefore typical of HT-mylonites: The HT synkinematic microstructure was deeply transformed by long lasting annealing. The foliation is characterized by compositional layering resulting from phases segregation. The mineral stretching lineation is marked by elongated crystals and boudinage. The planar and linear structures are difficult to observe and was mapped using the magnetic susceptibility anisotropy technique. For a better understanding of the deformation mechanisms active in granulite-mylonites, we have performed a detailed study of the microstructures coupled with systematic measurements of the lattice-preferred orientation (LPO) for the various minerals. LPO measurements were performed using a scanning electron microscope equipped for electron back scattered diffraction (EBSD). Indexation of diffraction patterns allows to determine the true LPO for all classes of crystallographic symmetry and to map the repartition of crystallographic orientations. LPOs of plagioclase, quartz, orthopyroxene, K-feldspar, amphibole, biotite, garnet and oxydes have been measured, and are discussed in terms of grain-scale processes during and after deformation. The intracrystalline slip, recrystallization processes (subgrain rotation and grain boundary migration) and annealing are the principal mechanisms. 3-D seismic properties of these granulite-mylonites have been calculated using the measured LPO. This allows us to evaluated the potential of granulitic shear zones to provide specific signals in seismic reflection/refraction or seismic anisotropy studies.