GEOLOGY AND GEOCHEMISTRY OF KOMATIITES AND THOLEIITES FROM THE BARBACENA GREENSTONE BELT, MG: REMNANTS OF AN ANCIENT OCEANIC PLATEAU

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Numerous geological models have been proposed to explain the geodynamic environment responsible for the origin of greenstone belts. Such models attempt to explain the structural, stratigraphic or geochemical aspects usually seen in greenstone belts as well as the frequent juxtaposition of allochthonous terranes. The present paper deals with the geology and chemical composition of mafic and ultramafic volcanic rocks of the Barbacena Greenstone Belt in the Nazareno area at the southernmost margin of the São Francisco Craton. The mineralogy and chemical composition of the volcanic rocks provide evidence for their possible geological setting**.**

The Barbacena Greenstone Belt rocks are distributed in two irregular NE-SW stripes, named Nazareno and Rio das Mortes belts, surrounded by intrusive Paleoproterozoic granites. The Nazareno belt is made up mainly by metavolcanic rocks with komatiitic affinity and rare intercalations of gondites, cherts and fine-grained amphibolites. The Rio das Mortes belt is compose mainly by metamafic rocks of tholeiitic filiation represented by fine grained metabasalts, amphibolites and mafic schists with intercalations of metasedimentary rocks.

Komatiitic rocks are Al-depleted and display chemical features similar to classical occurrences of ADK komatiites with $Al_2O_3/ TiO_2 < 20$, ratios between Ti, Zr and Sc distinct from chondritic values, and heavy REE depletion. The combination of these factors suggests Al, Sc and heavy REE retention at the source in some residual fractionated phase, possibly majorite. Considering that garnet becomes progressively more stable at high partial melting

rates as the pressure increases, it is possible to suppose that the komatiites were generated from deep mantle sources between 450 and 650 Km**.** Tholeiitic rocks display transitional features between E-MORB and N-MORB, with respect to the behavior of incompatible HFSE and REE elements, and are similar to basalts from oceanic plateaus generated by mantle plumes at oceanic intra-plate settings.

We suggest that the volcanic rocks from Nazareno area have their origin linked to deep mantle plumes in a tectonic environment similar to that of modern oceanic plateaus. The lines of geological evidence that support this interpretation are: (i) The association of komatiites, tholeiites and pelagic sedimentary rocks is consistent with an intra-oceanic setting similar, for instance, to the present-day Caribbean Plateau; (ii) the absence of terrigenous sediments and the lack of evidences for contamination by continental crust , support an ensimatic origin for this volcano-sedimentary sequence; (iii) tholeiites display incompatible element ratios and near- flat REE patterns typical of basalts from Phanerozoic oceanic plateaus.

Given the fact that oceanic plateaus are normally thicker than normal oceanic crust formed at mid-oceanic ridges and are more buoyant and relatively unsubductable, we propose that the komatiitic-tholeiitic rocks from the Barbacena Greenstone Belt represent remnants of an ancient oceanic plateau sequence accreted along the continental margin, represented by the 3.1 Ga old gneisses and migmatites belonging to the Campo Metamorphic Belo Complex, during late Archean or Paleoproterozoic times.