

Geochemistry of Cerro La Tuna Serpentinites of Paso Del Dragón Complex - Dom Feliciano Belt in NE Uruguay

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Serpentinites are generated in different tectonic environments related with fluid interactions of different origins, either in continental or in oceanic lithosphere. Their study is a major tool to know their geologic and tectonic nature. A serpentinite body, known as Cerro La Tuna, with up to 1500 m long and 700 m width, is part of Paso del Dragón Complex (PDC) [1] in the Dom Feliciano belt at NE of Uruguay. This belt was developed during West Gondwana amalgamation due to the collision between Río de la Plata and Kalahari cratons [2]. The Paso del Dragón Complex comprises deformed and poly-metamorphosed volcanic, sedimentary, and ultramafic rocks. Previous studies of Cerro La Tuna serpentinites only focused on general aspects [1] [3][4]; as a result, the origin of this serpentinite body is still a matter of debate. With the aim to characterize this serpentinite body we provide petrographic and geochemical information. Both pseudomorph (mesh, banded-growth, bastites) and non-pseudomorph (interpenetrative and interlocking) textures occur. Also, several serpentinization episodes are observed. The dominant mineral assemblages are serpentine + chlorite + magnetite and, serpentine + magnetite + chlorite + tremolite + talc, indicating lower greenschist facies conditions. In addition, vestiges of clinopyroxene and spinel suggest former conditions of amphibolite facies metamorphism. The samples have MgO/SiO_2 between 0.60 and 0.99, while $Al_2O_3/SiO_2 < 0.079$ suggesting harburgitic and/or lehrzolithic protolith. The average contents of Co (107 ppm), V (50 ppm), and the elevated Cr (4230 ppm) and Ni (2305 ppm) are consistent with peridotitic values. The total amount of REE varies from 0.71 to 7.68 ppm. Their patterns are slightly depleted in LREE and enriched in HREE ($La_N/Sm_N = 0.17-3.47$; $La_N/Yb_N = 0.24-3.24$; $Sm_N/Yb_N = 0.33-0.79$). Further research (on mineral chemistry and isotopic studies) to elucidate its genesis is being developed.

[1] Peel et al. (2018) JSAES, 85:250-262. [2] Fragoso-César (1980) XXXI Congresso Brasileiro de Geologia 5:2879-2892. [3] Bossi & Navarro (1988) 6° Panel Geol. Litoral - 1ª Reunión Geol. Uruguay. 1, 91-95. [4] Bossi & Schipilov (2003) Rocas ígneas básicas del Uruguay. FAGRO-CSIC, Montevideo, vol. II, pp. 78.