SCHIST-ASSOCIATED TOURMALINITES AT PASO DEL DRAGÓN COMPLEX, URUGUAY

Peel, E. [1]; De Armas, I. [1]; Silva Lara, H. [1]; Garda, G.M. [2]
[1] Instituto de Ciencias Geológicas - Facultad de Ciencias, Universidad de la República (Uruguay)
[2] Instituto de Geociências - Universidade de São Paulo (Brasil)

ABSTRACT: Paso Del Dragon Complex outcrops in the northeastern region of Uruguay as a N20-EW trending belt. It is constituted by a multi-deformed meta-volcano-sedimentary association, composed by a) quartz-feldspar-muscovite schist, with intercalations of quartzite, felsic meta-volcanic rocks and amphibole-garnet schists; and b) Ultramafic rocks constituted by serpentinites, magnesian schists and amphibole schists. Tourmalinite levels were already recognized and described in association with serpentinites on previous works. Here we present and discuss petrographic data of new tourmalinite levels found in association with quartz-feldspar-muscovite schist. These levels are decimetric and concordant with the schist's S_b. They are tenacious, dark colored and medium to fine grained rocks. The main mineralogical composition is tourmaline in a more or less developed quartz matrix, with tremolite and opaque minerals as principal accessories. The tourmaline crystals have a euhedral tendency, they show a decussate texture and exhibit an important zonation between light brown and bright green, developing four zones. These zones are concentric in basal section, and elongated in concordance with crystal length, but they can also be irregular or patchy. Tourmaline crystals show some inclusions, being the more common quartz and opaque minerals. Scanning electron microscopy using a JEOL 5900 Low Vacuum with coupled NORAN EDS, located at Facultad de Ciencias (Universidad de la República), were used for more detailed studies. The operating conditions were: 20 kV acceleration voltage, 20nA electron beam current and 5 µm spot. Back-Scattered Electron (BSE) images, EDS individual spot analysis and compositional maps were obtained for selected samples. Compositional maps were processed by superposition of different element signals (for example Si-Al, Mg-Fe, Si-Ti, etc.), showing that the zones on the tourmaline are determined by differences in the Fe and Mg contents. It also showed a Fe-Ti distribution on the opaque minerals, who were identified as rutile and ilmenite. Punctual analysis and transects made on tourmaline crystals shown a Mg-dominant character of the mineral (dravite-like tourmaline), like the tourmalines associated with serpentinites. The principal differences between schist-associated and serpentinite-associated tourmalinites is that the last have a chlorite dominated matrix, a big amount of diverse inclusions on tourmaline crystals (quartz, zircon, rutile, tremolite, etc.) and important amount and diversity of accessory minerals (specially monacite and rutile), while the former have a quartz-dominated matrix, less amount and diversity of inclusions in the tourmaline crystals (essentially quartz, rutile and ilmenite) and apparently absent chlorite, monazite and zircon. Mineral chemistry studies and isotopic analysis are being carried out to establish their genesis and tectonic implications.

KEYWORDS: TOURMALINITE, MINERALOGY, PASO DEL DRAGÓN COMPLEX