

Isotopic Characterization of Two Tourmalines from Wolfram Districts of Sierras Pampeanas Orientales, Argentina.

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In the Sierras Pampeanas Orientales, Argentina, there exist numerous scheelitic districts in a 300 km-length area. Agua de Ramón and Ambul districts, distant 70 km to each other, are related to amphibolites (tholeiitic basalts) and calc-silicate rocks and have lithological and depositional aspects which can be correlated, as the tourmaline occurrence in tourmalinites and in wolfram bearing quartz veins, as well as a volcanic origin. Boron isotopic values obtained in both tourmalines are as follows:

Agua de Ramón district Ambul district

Tourmalinite $\delta^{11}\text{B} = -23.2\text{‰} \quad -18.8\text{‰}$

Veins (remobilized tourmaline) $\delta^{11}\text{B} = -22.1\text{‰} \quad -24.0\text{‰}$

These values would allow to characterize the origin of boron from non-marine evaporites and to differentiate them from the tourmalines related to metasedimentary clastic rocks, submarine hydrothermal fluids or marine evaporites.

Up to now there is not geologic evidences in this region to assess the existence of non-marine evaporites in the sequence. The boron can be derived from metasedimentary and metavolcanic rocks of the basement by circulating submarine hydrothermal fluids, a similar process to the one of many other hydrothermal fluids which form massive sulfide deposits.

The similar isotopic values between tourmaline occurrence in tourmalinites related to stratabound scheelitic mineralization and in wolfram bearing quartz veins suggest a common origin for the boron and support the hypothesis that wolfram and boron would be remobilized products due to effects of regional metamorphism.