6-3 - SR-ENRICHED HIGH-PRESSURE TOURMALINE FROM A MAFIC ECLOGITE

Sunday, 22 September 2019 8:50 AM - 9:05 AM Phoenix Convention Center

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##### Abstract

An Eoalpine mafic eclogite, which occurs in the Kreuzeck Mountains (Austroalpine basement), Eastern Alps, Austria, contains tourmaline crystals, that contain the highest amount of Sr2+ (up to 0.68 wt% SrO) known to date. This tourmaline exhibits unit-cell parameters with a = 15.944(1), c = 7.202(1) Å. Analyses by a combination of electron microprobe, optical absorption spectroscopy and crystal-structure refinement result in the structural formula X(Na0.85Ca0.08Sr0.06K0.01)Σ1.00 Y(Mg1.7Al0.7Fe3+0.4Ti4+0.1Fe2+0.1)Σ3.00 Z(Al5.1Mg0.8Fe3+0.1)Σ6.00 T(Si5.8B0.1Al0.1O18)(BO3)3 V(OH)3 W[O,(OH)]. The T site contains mainly Si and additionally small amounts of B and Al. Optical absorption spectroscopy was used to estimate the percentage of Fe2+. For this purpose the band near 1120 nm was used, because it is the band that is best separated from other bands. According to this estimation, the Fe3+/Fe ratio is ca. 80%, suggesting that this high-pressure tourmaline crystallized under oxidizing conditions. Therefore it contains a significant oxy-dravite component. There is no evidence for significant X-site vacancy in the investigated tourmaline zones.

A crustal source of B would be consistent with relatively high Li concentrations up to 8 mg g-1 Li in zircons, intergrown with the tourmaline [3]. Commonly**,** tourmaline-bearing pegmatites of the Austroalpine basement units are in contact with marbles. A pegmatite from the Austroalpine basement was found at the Koralpe, Eastern Alps, Styria, Austria, that is in contact with both a mylonitic garnet-mica schist and with marble. It contains Al-rich tourmaline with 189 ppm Sr [1]. Magnesium-rich tourmalines from the contact zone of Permian pegmatites with mica schists and marbles from different localities of the Austroalpine basement units (Rappold Complex) in Styria, Austria, contain up to 142 ppm Sr [2]. It can be concluded that tourmaline-bearing pegmatites, which seem to be the original boron sources for this tourmaline crystallization in the investigated eclogite, were influenced by a Sr-enriched metacarbonate. Some of these marbles contain Sr contents up to 1300 ppm [4].

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**References**

[1] Ertl, A. et al. (2006), Am. Mineral., **91**, 1847-1856.

[2] Ertl, A. et al. (2010), Mineral. Petrol., **99**, 89-104.

[3] Konzett, J. et al. (2012), J. Petrology, **53**, 99-125.

[4] Puhr, B. et al. (2008), Abstr., DMG 86th Annual Meeting 14-17 Sept. 2008, Berlin, Germany, 307.

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