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Povondraite-rich tourmaline from the Darasun gold deposit, Transbaikalia, Russia

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A ferric-iron-rich tourmaline was recently described from the Darasun gold deposit, Transbaikalia, Russia (Baksheev et al., 2011). A structure refinement of a single crystal has shown that significant amounts of Fe occupy also the Z site. The R value (∼3.8%) is, compared to similar tourmalines, relatively low. Considering the chemical composition, the final crystal-chemical formula of this tourmaline can be expressed as ${}^{X}(Na_{0.8}Ca_{0.2})$ ${}^{Y}(Fe^{3+}_{1.4}Mg_{1.0}Fe^{2+}_{0.6})$ ${}^{Z}(Al_{3.4}Fe^{3+}_{1.9}Mg_{0.7})$ $(Si_{5.9}Al_{0.1}O_{18})$ $(BO_3)_3$ ${}^{V}(OH)_3$ ${}^{W}[O_{0.8}(OH)_{0.2}]$. Hence, this tourmaline has a povondraite component of ∼30 mol.-%. The lattice parameters are relatively high (a = 16.10, c = 7.33 Å), which is in agreement with a substantial povondraite component. The distance for $<Y$-O$>$ = 2.05 Å and for $<Z$-O$>$ = 1.97 Å. Usually the $<Z$-O$>$ bond-length varies from 1.91-1.93 Å in Fe- and Mg-bearing tourmalines, which don't contain a significant amount of Fe at the Z site. Povondraite-rich tourmalines occur worldwide only in a very few localities.

References

Baksheev, I.A., Prokof'ev, V.Yu., Yapaskurt, V.O., Vigasina, M.F., Zorina, L.D., Solov'ev, V.N. (2011): Ferric-iron-rich tourmaline from the Darasun gold deposit, Transbaikalia, Russia. Can. Mineral., 49, 263-276.