Japan Association of Mineralogical Sciences

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DISCOVERY OF A NEW TOURMALINE: ADACHIITE

Dr. Daisuke Nishio-Hamane, a mineralogist at the Institute for Solid State Physics of the University of Tokyo, has found and described a new tourmaline, called adachiite, in collaboration with Dr. Tetsuo Minakawa, a professor of mineralogy at Ehime University, and other members of JAMS. The new mineral was found at the Kiura mine, Oita Prefecture, Japan. It is named in honor of Tomio Adachi (b. 1923) (Fig. 1), a well-known amateur mineralogist who has contributed to the field of mineralogy as a local guide. Adachiite has been approved by the IMA Commission on New Minerals, Nomenclature and Classification (#2012-101).

Figure 1 Adachiite is named in honor of Tomio Adachi, a well-known amateur mineralogist in Japan.

Adachiite occurs in "emery," which is an ultrahard rock consisting mainly of corundum, hercynite, and magnetite. Emery deposits were discovered in the Kiura mine in 1959. Emery is mined as a raw material from hard aggregates, and the unmarketable low-grade material is generally discarded. Adachiite was found in a hydrothermal vein in the low-grade material. Adachiite occurs as hexagonal, prismatic crystals (Fig. 2) and forms a zoned structure closely associated with schorl. The massive tourmaline aggregate is black (Fig. 3), while small crystals are transparent with a brownish to bluish purple color (Fig. 2).

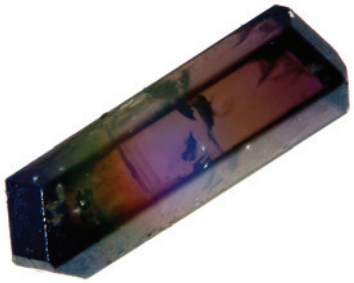

Figure 2 Adachiite in the form of a hexagonal, prismatic crystal with a transparent brownish to bluish purple color

A notable feature of adachiite is its chemical composition. Adachiite, $CaFe_3Al_6(Si_5AlO_{18})(BO_3)_3(OH)_3(OH)$, is characterized by Al in the *T* site, and can be compositionally formed by Tschermak-like substitution ($M^{2+} + {}^{T}Si^{4+} \leftrightarrow Al^{3+} + {}^{T}Al^{3+}$) from calcic tourmaline, $CaFe_3(MAl_5)(Si_6O_{18})(BO_3)_3(OH)_3(OH)$. Adachiite is the first tourmaline formed via Tschermak-like substitution, and conclusively has the lowest Si content. The formation of adachiite is facilitated by the extremely high-Al and low-Si environment in emery.

Figure 3 A massive tourmaline aggregate

JOURNAL OF MINERALOGICAL AND PETROLOGICAL SCIENCES

Vol. 109, no. 1, February 2014

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