

Johnkoivulaite, Cs(Be₂B)Mg₂Si₆O₁₈, a new mineral of the beryl group from the gem deposits of Mogok, Myanmar

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ABSTRACT

A new mineral of the beryl group, johnkoivulaite, Cs(Be₂B)Mg₂Si₆O₁₈, was recovered from the gem gravels in the Pein Pyit area of the Mogok region in Myanmar. Thus far, only a single crystal has been identified. It has dimensions of about 5.8 × 5.7 × 5.5 mm. This specimen has an irregular shape but still has discernible crystal form with geometric growth patterns observed on the crystal faces. The crystal of johnkoivulaite is grayish-violet in color and strongly pleochroic, going from nearly colorless with E||c to dark bluish-violet with E||a. Johnkoivulaite has a Mohs hardness of about 7½ and a measured density of 3.01(10) g/cm³. It is uniaxial (–) with ω = 1.607(1) and ε = 1.605(1) (white light). Electron microprobe analyses gave the empirical formula of (Cs_{0.85}K_{0.10}Na_{0.01})(Be_{1.88}B_{1.12})(Mg_{1.66}Fe_{0.27}Mn_{0.01}Al_{0.05})(Si_{5.98})O₁₈ with Be calculated by stoichiometry and confirmed by LA-ICP-MS measurements. Johnkoivulaite is hexagonal, *P6/mmc* (no. 192) with *a* = 9.469(2), *c* = 9.033(2) Å, *V* = 701.5(3) Å³, and *Z* = 2. Johnkoivulaite is isostructural with beryl and exhibits partial substitution of B for Be at the distorted tetrahedral site, Mg for Al at the octahedral site, and Cs in the channel sites within the stacked Si₆O₁₈ rings. This substitution can be written as (CsMg₂B)(□Al₂Be)_{–1}. Johnkoivulaite, the seventh member of the beryl group, is named in honor of gemologist John Koivula in recognition of his contributions to mineralogy and gemology.

Keywords: Beryl group, new mineral, gemology, johnkoivulaite, Mogok, Myanmar