EUGENY V. GALUSKIN
Faculty of Geochemistry, Mineralogy and Petrography, Department of Earth Sciences, University of Silesia, Bedzinska 60, Sosnowiec 41-200, Poland

IRINA O. GALUSKINA
Museum of Earth, Department of Earth Sciences, University of Silesia, Bedzinska 60, Sosnowiec 41-200, Poland

Groat et al. (1998) proposed recently that wiluite, a boron-bearing variety of vesuvianite, is a new mineral species. Unfortunately, the authors did not refer to the results of numerous previous investigators of wiluite, which resulted in the inaccurate description of both the internal structure and optical properties of wiluite crystals. Here, we critically discuss some of their results.

Wiluite has been known more than 200 years (Lyachovich 1954). That it is the boron-bearing variety of vesuvianite was determined by Jannasch (1884). Kurbatov (1946) suggested that the name wiluite was given by Haüy. According to Lyachovich (1954), however, the name originated in Russia. The name wiluite appeared earlier than vesuvianite (Betechtin 1951). One can find in Lyachovich’s work (1954) a complete historical review of investigations of wiluite, which was brought from the shores of Wiluy River by Laksman in 1790 and was described for the first time by Pallas (1793).

Prendel (1887), Lyachovich (1954, 1955) and others observed a zonal-sectoral structure in wiluite crystals. The outer rims of the crystals they studied show oscillatory zoning, with values of the 2V angle attaining 30–35° independently of the growth sector. Thin oscillatory zoning is visible owing to the different optical orientation of the compositional zones (Lyachovich 1954).

Groat et al. (1998) investigated the optical properties of a wiluite crystal with simple forms {100} and {101} and subordinate forms {110} and {001} (structural orientation) in a section perpendicular to Z(?) by means of electron-microprobe analyses (CAMECA SX–50, accelerating voltage 10 kV, beam current 50 nA, counting time 100 s per point) on a single crystal of wiluite to determine the boron concentration. We have observed a heterogeneous distribution of boron, as well as Fe, Ti, Mg and Al, in a zoned crystal with a morphology identical to the crystal investigated by Groat et al. (1998). Most of the analyses gave a boron concentration lower than 2.5 atoms per formula unit [i.e., less than half of the T(boron)] position and less than ~2.8 wt.% B₂O₃, which is typical for boron-bearing vesuvianite and lower than expected in wiluite (Groat et al. 1998). Yet, the crystals have all the properties typical of wiluite.
The heterogeneous distribution of boron in a sector-zoned crystal of wiluite has already been observed by Groat et al. (1992); therefore, the notion of the chemical homogeneity of a wiluite crystal described by Groat et al. (1998) requires further explanation.

It is necessary to emphasize that Yakutian wiluite has a higher concentration of boron than wiluite from other localities. Wherry & Chapin (1908) and Lyachovich (1955) reported 4.14% and 4.66% B$_2$O$_3$, respectively. Groat et al. (1992) disregarded these determinations without explanation, and concluded that the highest concentration of boron (~3.18% B$_2$O$_3$) occurs in vesuvianite (wiluite) from Templeton Township, Quebec and Tulare Country, California. However, our recent determination of boron in the same sector-zoned crystal of wiluite by photometric method and by electron-microprobe analysis gave 4 wt.% B$_2$O$_3$ (analyst L. Pautov, Fersman Mineralogical Museum, Moscow) and 4.86 wt.% B$_2$O$_3$, respectively, thus confirming the high concentrations of boron in wiluite determined by Wherry & Chapin (1908) & Lyachovich (1955).

Groat et al. (1998) did not provide new data on infrared spectroscopy of wiluite. They referred to Groat et al. (1995), in which only the OH region of the infrared spectrum of wiluite was investigated. However, the absorption band at 1300 cm$^{-1}$, ignored by Groat et al. (1998), is a prominent feature of the infrared absorption spectrum of wiluite, and it distinguishes wiluite from vesuvianite (Minerals 1972, Galuskina 1998).

The investigation of wiluite carried out by Groat et al. (1998) showed that wiluite as a new mineral species needs further investigations focused on its growth-induced heterogeneity, which reflects its history of crystallization. A Russian version of this paper was published in the Proceedings of the Russian Mineralogical Society (Galuskin & Galuskina 2000).