

THE BRIGHT OPTICAL FACE OF FERSMANITE

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The short characteristic of fersmanite, rare mineral of alkaline magmatites, pegmatites and hydrothermalites is given. The mineral is called in honor of Alexander Evgen'evich Fersman, the well-known mineralogist, the geochemist, the traveler, the geographer, the poet of a stone. The microphotographs showing a bright optical face of fersmanite are given.

3 figures, 10 references.

Keywords: A.E. Fersman, fersmanite, microphotographs in transmitted light.

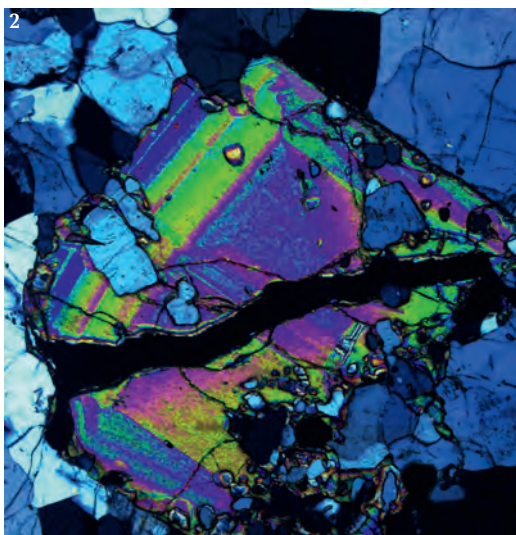
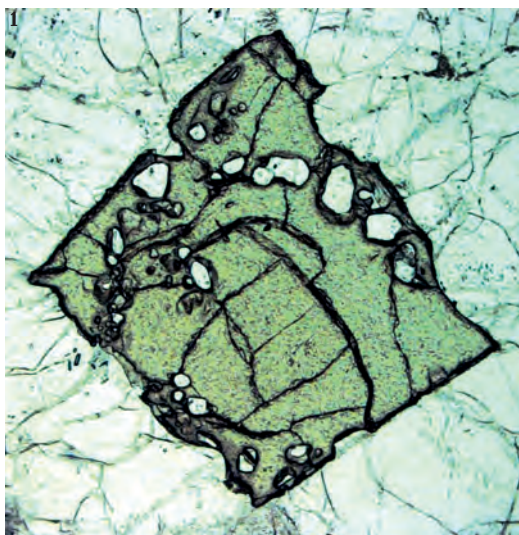
Fersmanite — the rare, but characteristic mineral of the alkaline pegmatites and alkaline hydrothermalites which are rather widely developed in the central part of the Khibiny intrusive, firstly was opened and studied by A.N. Labuntsov (Labuntsov, 1929; Labuntsov, 1933; Sokolova, 1986). The mineral is called in honor of Alexander Evgen'evich Fersman — the well-known mineralogist, geochemist, geographer, traveler, the poet of a stone. So far in addition to Khibiny Mountains fersmanite is established in alkaline formations of Brazil (Atencio *et al.*, 1999) and Rhine graben (Hentschell, 1993). Optical properties of fersmanite were defined by I.D. Borneman-Starynkevich (Starinkevitsch-Borneman, 1939). For this monocline mineral the characteristic optical properties are as follows: high relief with $n_g =$

1.91–1.94, very strong double refraction of $n_g - n_p = 0.04 - 0.05$, sometimes zonal structure, a small angle of optical axes (less than 7° is characteristic) are characteristic. The composition and structure of fersmanite were refined in 1977 (Machin, 1977). V.V. Ilyukhin with colleagues for the first time determined an accurate formula $\text{Ca}_4(\text{Na,Ca})_4\text{Ti}_3(\text{Nb,Ti})_1(\text{Si}_2\text{O}_7)_2\text{O}_8\text{F}_3$ and solved completely the crystal structure of fersmanite from Khibiny (Morocco *et al.*, 1984). Their version of fersmanite structure and its formula is confirmed in Elena Sokolova's article (Sokolova *et al.*, 2002). Fersmanite is the tetramer, similar to batisite (Nikitin, Belov, 1962).

Thin sections with fersmanite are prepared of samples which are collected on the Eveslogchorr Mountain, in the Vuonnemiok river

Fig. 1. Relatively regular fersmanite crystal with a high relief in the nepheline – K-Na feldspar matrix. Transmitted light at a single nicol. Width of the field of view is 5 mm.

Fig. 2. A zoned fersmanite crystal. Transmitted light, crossed polars. A crack in the center of a crystal is defect of a section. Width of the field of view is 5 mm.



valley, Khibiny Mountains. Fersmanite associates with feldspar, nepheline, aegirine, pectolite. A form of crystals is various, from xenomorphic to rather regular. In transmitted light with a single nicol, fersmanite (Fig. 1) resembles titanite (sphene). A distinct zoned crystals structure of the Khibiny fersmanite and its bright optical face illustrate microphotographs in a transmitted light at crossed nicols (Figs. 2, 3).

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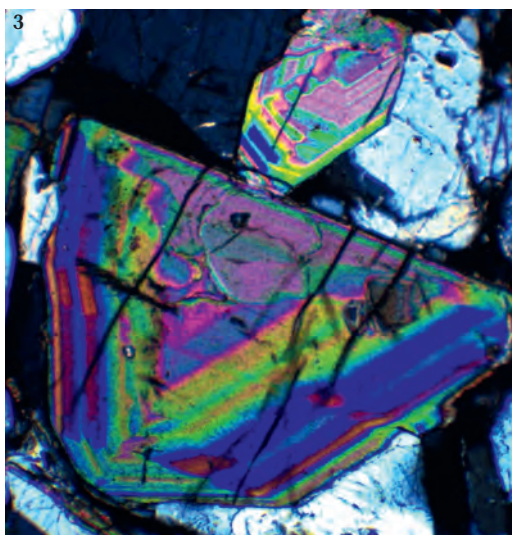


Fig. 3. Intergrowth of zoned fersmanite crystals. Transmitted light at a single nicol. Width of the field of view is 5 mm.