GRØNLANDS GEOLOGISKE UNDERSØGELSE
BULLETIN No. 68

CONTRIBUTIONS TO THE MINERALOGY OF ILÍMAUSSAQ

Nos 3–7

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GRØNLANDS GEOLOGISKE UNDERSØGELSE

I.

GENTHELVITE FROM THE ILÍMAUSSAQ ALKALINE INTRUSION, SOUTH GREENLAND

CONTRIBUTION TO THE MINERALOGY OF ILÍMAUSSAQ, No. 4

BY HALDIS BOLLINGBERG AND OLE V. PETERSEN

WITH 2 TABLES IN THE TEXT

II.

ON BERYLLITE AND BERTRANDITE FROM THE ILÍMAUSSAQ ALKALINE INTRUSION, SOUTH GREENLAND

CONTRIBUTION TO THE MINERALOGY OF ILÍMAUSSAQ, No. 5

BY STEEN ANDERSEN
WITH CHEMICAL ANALYSES BY
IB SØRENSEN

WITH 3 FIGURES AND 4 TABLES IN THE TEXT
AND 1 PLATE

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C. A. REITZELS FORLAG
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I.

GENTHELVITE FROM THE ILÍMAUSSAQ ALKALINE INTRUSION, SOUTH GREENLAND

CONTRIBUTION TO THE MINERALOGY OF ILÍMAUSSAQ, No. 4

BY

HALDIS BOLLINGBERG

AND

OLE V. PETERSEN

Abstract

Tiny white or yellow grains of genthelvite have been found in cavities in albititic veins in the Ilímaussaq alkaline intrusion. The veins also contain ægirine, neptunite, catapleiite, eudidymite, epididymite, tugtupite and leucophane.

The mineral has been identified by means of x-ray and spectrographic methods.

Mode of occurrence

Genthelvite has been discovered in an eudidymite-bearing vein of albite on the Taseq plateau in the northern part of the Ilímaussaq alkaline massif. The albitite intersects and impregnates poikilitic sodalite syenite (naujaite).

The eudidymite-bearing albitite veins of the Taseq plateau have been described by SEMENOV and SØRENSEN (1966). In the present paper only the genthelvite will be mentioned.

Genthelvite was found in a specimen (no. 77282e) collected by SEMENOV and SØRENSEN in 1964 and handed over to the writers for closer examination.

The specimen measures 6×3×2 cm and consists of fine-grained albitite with hair-like ægirine, euhedral neptunite and aggregates of fine-grained catapleiite.

Genthelvite occurs as small white or faintly yellow grains up to one mm across associated with very fine-grained (earthy) albite in cavities in the albitite.

The genthelvite is colourless and isotropic in thin sections, with refractive index $\leqq 1.75$. The fracture is subconchoidal.

Table 1 presents the Debye-Scherrer diagrams of genthelvite from Ilímaussaq (column 1) together with those of genthelvite from Jos, Northern Nigeria (column 2) and danalite from Needlepoint Mountain, McDane area, B. C. (column 3).

Chemical composition

The element analysis of the mineral was very difficult because of the small amount available. Only 1 mg powder from the glass fibre used for the X-ray powder diagram, could be analysed.

Spectrographic analysis was the only method possible. But the material had to be diluted to fill one electrode. Silicium-dioxide was chosen as diluter in order to be able to use the established standard curves for beryllium-silicates. This will of course disturb the determination of silicium in the mineral. However, only the quantities of zinc, manganese and iron are important for the identification of the mineral.

Table 1.

GENTHELVITE Ilimaussaq Radiation Fe K_α Mn-filter Camera 2R = 90 mm.		GENTHELVITE Jos, Northern Nigeria ASTM Powder Diffraction File 1963, 13–114.		DANALITE Needlepoint Mountain McDane area, B.C. ASTM Powder Diffraction File 1963, 11–491.	
Int.	d_{hkl}	Int.	d_{hkl}	Int.	d_{hkl}
–	–	40	4.07	10	4.09
2	3.68	40	3.65	40	3.68
10	3.35	100	3.33	100	3.35
1	2.90	40	2.875	10	2.897
1	2.79	–	–	–	–
4	2.60	70	2.577	30	2.591
2	2.36	40	2.351	20	2.368
1	2.28	10	2.258	10	2.274
5	2.19	100	2.174	50	2.193
–	–	–	–	10	2.129*
1	2.05	40	2.036	10	2.052
8	1.932	100	1.918	70	1.932
3	1.834	70	1.822	20	1.833
1	1.790	10	1.778	10	1.790
1	1.752	10	1.735	–	–
4	1.675	70	1.663	30	1.678
2	1.608	40	1.596	20	1.607
–	–	10	1.513	10	1.524
4	1.499	70	1.489	20	1.498
4	1.452	70	1.441	40	1.451
4	1.409	70	1.399	30	1.410
4	1.369	70	1.359	30	1.368
4	1.331	70	1.322	30	1.333
1	1.297	10	1.288	5	1.297
4	1.263	70	1.258	40	1.268
1	1.235	10	1.230	5	1.237
1	1.222	10	1.215	5	1.224
1	1.210	10	1.200	5	1.208
2	1.182	10	1.176	5	1.185
3	1.159	10	1.152	10	1.162
–	–	10	1.119	5	1.128
6	1.114	70	1.109	50	1.118
4	1.075	10	1.072	20	1.079
–	–	–	–	10	1.051
6	1.039	40	1.035	50	1.043
7	1.002	70	1.004	60	1.012
			cont.		cont.
					*unindexed

Table 2. *Spectrographical analysis of genthelvite from Ilímaussaq, with chemical analyses of genthelvite from Lovozero and Colorado.*

(Weight percent)

	Ilímaussaq	Lovozero	Colorado
SiO_2	40	27.35	30.26
BeO	15	12.00	12.70
ZnO	38	40.00	46.20
MnO	0.6	10.21	1.22
FeO	1.2	6.04	6.81
S	–	5.74	5.49
Total	94.8	101.34	102.68
– O = S		2.87	2.74
		98.47	99.94
Analyst	H. Bollingberg	M. E. Kazakova	M. E. Kazakova

The mineral powder was accordingly mixed with silica, strontium carbonate and powdered carbon containing 0.02% paladium in the proportion 1:1:2:8. Strontium and paladium serve as internal standards and give a double check on the determinations. The relative analytical error is estimated to be + 50 – 25%.

A Hilger large quartz spectrograph and Ilford G.30 plates were used. The results of the analysis are recorded in table 2 together with two chemical analysis of genthelvite taken from Eskova (1957) as quoted in Vlasov, Kuzmenko and Eskova (1959).

The chemical analysis, the refractive index and to a lesser degree the X-ray powder diagram all point towards the mineral being genthelvite.

Discussion

The mode of occurrence of the genthelvite of Ilímaussaq recalls that of genthelvite in the Lovozero alkaline intrusion of the Kola peninsula, where genthelvite is a late pegmatite mineral occupying the interstices between the rock-forming minerals. The genthelvite of Lovozero is restricted to "crossed line" pegmatites formed by assimilation of Fe, Mn, Mg and Ca from Devonian volcanic rocks in the pegmatitic solutions (Vlasov *et al.*, 1959, p. 453). In Ilímaussaq the genthelvite-bearing albitites occur rather close to the western contact of the intrusion, but no traces of assimilation of country rocks have been found. The albitite

containing the genthelvite contains in other hand specimens the beryllium minerals eudidymite, epididymite, tugtupite and leucophane (SEMENOV and SØRENSEN, 1966).

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