SCHETELIGITE, A NEW MINERAL

PRELIMINARY NOTE

BY

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In the present paper a short description is given of a new granite pegmatite mineral which I have named after my late chief and teacher Professor Jacob Schetelig, director of the Mineralogical Museum in Oslo, unquestionable the best judge of Norwegian pegmatite minerals in his time.

The last find of a new Norwegian mineral (1910) was Schetelig's detection of thortveitite, a silicate of scandium.

The mineral scheteligite was found in the summer of 1933 in a small pegmatite dike at Torvelona about 200 m east of the farm Øvre Ljosland in Iveland. That summer only one crystal of the mineral was found, and X ray spectrograms showed it to be a hitherto undescribed mineral. Not until the summer 1936 sufficient material for a chemical analysis could be collected. In all 20 30 rock samples containing small crystals of the mineral were found. The largest crystal had a weight of a little more than 0.5 gr.

Description. The powdered mineral is pale yellow to greyish, under the microscope translucent in reddish-brown colors. Large pieces are brilliantly black with perfect conchoidal fracture; cleavage none, isotrope, hardness 5.5, sp. gr. 4.74.

It usually occurred imbedded in quartz, more seldom in feldspar. The crystals exhibit an orthorhombic habit, with pyramide faces developed on only one side while the other parts of the crystals were without crystal outlines. Owing to the roughness of the crystal faces and the fact that only two faces were present in any one zone it has not been possible from the material available to determine the exact crystal symmetry of the mineral. Nor did X ray powder diagram of the heated mineral give any result.

Chemical analysis. An amount of 0.9 gr. of mineral substance was picked out for chemical analysis, and a series of X ray spectrograms was carried out to make sure that the material was homogeneous.

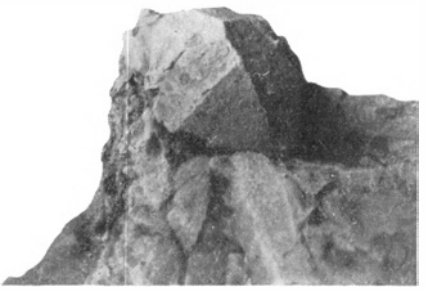

Fig. 1. Scheteligite in quartz. Torvelona, Iveland. 5 x.

The mineral contained, however, always small inclusions of microcline and quartz which were hard to get rid of. Particularly microcline stuck tenaciously to the powder, thus constituting the chief contamination in the sample prepared for chemical analysis. The amount of SiO_2 found in the analysis was therefore calculated as microcline.

The chemical analysis was carried out at the Mineralogical Institute of the University by Mr. B. Bruun, M. A. with kind permission and helpfulness of the director, Professor Dr. Tom. Barth. Owing to the unusual combination of elements, the chemical analysis was very difficult. The X ray spectral analyses were made by me.

The mineral powder was insoluble in strong acids but was brought into solution by digestion with H F. Sb and Bi were precipitated as sulphides, and Ti, Nb, Ta, and W were precipitated together as oxydes. Of the oxydes TiO_2 was colorimetrically determined, while no chemical separation of the other oxydes was effected. The relative content of these oxydes was determined from intensity data of their lines in an X ray spectrogram. For the other elements the usual chemical methods were used.

All chemical precipitates were tested on purity by X ray spectroscope analyses and in a few cases of incomplete separation the chemical procedure was repeated. Analytical errors of any consequence were in this way eliminated.

According to the analysis (table 1) scheteligite has the formula:

$$(Ca,\ Fe,\ Mn,\ Sb,\ Bi,\ Y)_2\ (Ti,\ Ta,\ Nb,\ W)_2\ (O,\ OH)_7$$

Since the composition of scheteligite differs very much from any previously described mineral the present data are not sufficiently complete for a full discussion of the systematic relations of the mineral. I hope, however, to be able to take up this problem in a later paper.

Occurence and paragenesis. The pegmatite dike in which the scheteligite was found is exposed in a road-cut and forms a small lense-shaped body imbedded in amphibolite. Much of it had been quarried as road-metal. Later the pegmatite was mined in search for scheteligite so today but little is left of it. The pegmatite differs from the ordinary granite pegmatites in Iveland by being composed chiefly

of plagioclase feldspar with only subordinate amounts of microcline. It is relatively rich in tourmaline, and constitutes the only known occurrence of native bismuth in Iveland. The complete mineral paragenesis is: Alvite, euxenite, monazite, scheteligite, biotite, muscovite, ilmenite, magnetite, bismuthinite, native bismuth, thortveitite, beryl, spessartite, tourmaline, microcline, plagioclase, and quartz.

Table 1.

Chemical analysis of Scheteligite from Torvelona, Iveland.

	%	Calculated		
CaO	10.73	Ca 187		
FeO	1.88	Fe 26		
MnO	6.19	Mn 87	412	X_2
Sb_2O_3	7.77	Sb 53		
Bi_2O_3	2.54	Bi 11		
Y_2O_3 (280)	6.00	Y 48		
TiO_2	18.73	Ti 234		
Ta_2O_5	20.—	Ta 90		
WO_3 33.65 %	5.—	W 22	410	Z_2
Nb_2O_5	8.65	Nb 64		
Loss on ignition	2.00			
SiO_2 6.00 % calculated as microcline	9.70	O 1396		
	99.19			

Formula:

X_2	Z_2	O_7
206 · 2	205 · 2	199 · 7

Many of the rare minerals of this pegmatite exhibit a peculiar thin prismatic habit: Euxenite in needle-shaped or in thin blade-like crystals; alvite and monazite in long prismatic crystals. Thortveitite is interesting; it is present in small well developed crystals frequently less than 1 mm across. It occurs imbedded in spessartite, beryl, and magnetite. The color is greenish, grey, yellow to white. Small crystals of beryl occurr abundantly. A more complete description of scheteligite and the mineral paragenesis of the dike will be given later.

I want to express my best thanks to the Fridtjof Nansen Fund for grants given to me for investigation of the Iveland pegmatites. I am also greatly indebted to Olav Landsverk Iveland who has helped me with the field work and to Miss Lily Monsen for the photograph.

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