

NOTES – NOTISER

Contribution to the mineralogy of Norway, No. 52

Sn Contents in some Nb-Ta Minerals

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Approximate Sn percentages are given for a large number of samples of columbite, samarskite minerals, ilmenorutile and euxenite minerals from granite pegmatites in southern Norway, especially in the Moss and Iveland-Evje districts. Sn contents in excess of 0.1 % are present in nearly all of the samples. Samarskite minerals from the Moss district often contain more than 1 % Sn, and ilmenorutile, the Sn-richest mineral in Iveland-Evje, usually contains more than 0.5 % Sn.

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Series of optical spectrograms of Nb-Ta minerals from Norwegian granite pegmatites, taken for other purposes, have been re-examined in search for Sn lines. Sn was found in nearly all of the samples. In order to determine the Sn contents approximately, a working curve constructed from spectrograms of amazonite-cassiterite mixtures was used. This curve is itself very satisfactory, but its direct application in the present case may be questioned because of the very great difference between the base substance and the minerals in question. However, the curve has turned out to give fairly reliable results, in particular because its topmost part could be checked by means of Blomstrand's values for the extremely Sn-rich yttrotantalites from Hattevik and Berg in the Moss district, quoted by Brøgger (1906). These high values are probably correct, even if many of the values given for Sn-poorer minerals in the old papers are certainly wrong. These old values are quoted in an earlier paper (Oftedal 1939) on Sn in Norwegian minerals. The present note may be taken as a supplement to that paper. The mineral species examined have been selected because they have earlier been found to contain in general most of the Sn present in their deposits. Estimates of Sn contents lower than 0.05% have not been attempted. The results are summarized in Table 1 (n is the number of spectrograms examined).

The main content of Table 1 is the relatively copious data from the two pegmatite-rich areas near Moss and in Iveland-Evje. Detailed localities and parageneses are given by H. Bjørlykke (1939). Columbite is common in

Table 1. Sn contents in some Nb-Ta minerals from Norway.

	Moss district		Kragerø		Arendal district		Iveland Evje		Hidra (Hitterø)	
	% Sn	n	% Sn	n	% Sn	n	% Sn	n	% Sn	n
Columbite	0.4	2	0.4	3			0.3	2		
	0.3	3	0.2	1			0.2	3		
	0.2	2					0.1	3		
	0.1	3					0.05	5		
	0.05	1								
	<0.05	4								
Yttrotantalite	2.5	2								
	1.5	1								
	1.0	1								
Samarskite	1.5	2			0.05	1	0.4	2		
	1.0	2					0.3	1		
	0.4	4								
	0.3	3								
	0.1	3								
Ilmenorutile					0.4	3	1.0	2		
							0.6	5		
							0.4	2		
Euxenite-blomstrandine					0.3	1	0.4	1	0.4	2
					0.2	2	0.2	5	0.3	1
					0.1	1	0.1	2	0.2	1
							0.05	3		
							<0.05	2		

both areas and also exhibits about the same range of moderate Sn contents. In the Moss district the very characteristic samarskite minerals show the highest Sn contents observed. It may be added that a specimen of the so-called ånnerødite gave about 0.1 % Sn in both the columbite and the samarskite.

In Iveland-Evje samarskite is quite rare, but the few samples examined tended to be somewhat richer in Sn than the associated columbites. The Sn-richest species in Iveland-Evje is clearly ilmenorutile, while the euxenite minerals are about on the same level as columbite. Ilmenorutile in Iveland-Evje is, according to Bjørlykke (l.c.), associated with the following minerals, not all in any single deposit: allanite, thorite, alvite, beryl, thortveitite, monazite, xenotime, fergusonite, euxenite, uraninite. Among these, euxenite and thortveitite (Oftedal 1969) are known to contain notable concentrations of Sn, but much lower than the ilmenorutile.

In conclusion, it has firstly been amply confirmed that in the pegmatites in question samarskite minerals reach by far the highest Sn concentrations. Secondly it has been shown that ilmenorutile, which has not been found associated with samarskite, is by far the Sn-richest mineral in its environment. Such a result had been foreseen by V. M. Goldschmidt (1954) because of the existence of cassiterites rich in Nb, Ta and Fe.

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