NOTES AND NEWS

GOLDSCHMIDTINE IDENTICAL WITH STEPHANITE

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Goldschmidtine was recently described (1939) as a new mineral occurring at Andreasberg, Harz, in orthorhombic crystals with the composition Ag_2Sb. To test the homogeneity of the crystals two polished sections were made, one of a typical crystal group, the other of a portion of the sample of crystal fragments used for the analysis. These sections showed only one mineral. *X*-ray powder photographs on samples drilled from the sections gave a pattern unlike that of dyscrasite—Ag_3Sb, the name attached to the specimen on which the orthorhombic crystals were found.

More recently Dr. G. A. Harcourt of the International Nickel Company wrote me that he had re-examined the polished sections and powder photographs of goldschmidtine and had found that they are indistinguishable from sections and photographs from two specimens of stephanite—Ag_5SbS_4 from Freiberg, Saxony. Dr. Harcourt also pointed out that the remaining properties given for goldschmidtine agreed with those of stephanite, except the specific gravity and the composition. The corresponding essential data compare as follows:

	GOLDSCHMIDTINE		STEPHANITE
	Analysis	Ideal	Ideal
Ag	64.78	63.9	68.5
Sb	35.01	36.1	15.2
S	0.06	—	16.3
$a:b:c$	0.6312:1:0.6860		0.6291:1:0.6851 (Vrba, 1886)
a_0, b_0, c_0	7.75, 12.32, 8.42 all ±0.05 Å		7.85, 12.48, 8.58 Å
$a_0:b_0:c_0$	0.629:1:0.683		0.629:1:0.687 (Salvia, 1932)
Twin plane	(110)		(110)
Hardness	2½		2–2½
Specific gravity	6.83		6.2–6.3

Dr. Berman kindly redetermined the specific gravity of goldschmidtine with the torsion micro-balance, which was not available when the material was first studied; the new values, 6.26, 6.27, lie within the range given for stephanite. A new analysis on a small sample of clean crystals of goldschmidtine, by the International Nickel Company, yielded: Ag 68.1, Sb 14.4, S 15.6±0.1; total 98.1, in good agreement with the composition of stephanite. It is clear, therefore, that the mineral described as goldschmidtine is in fact stephanite and that the name goldschmidtine must be withdrawn. By an unlucky chance a faulty analysis was compensated by an inaccurate specific gravity, giving an integral cell content and thus concealing the errors.

Since the mineral described as goldschmidtine is stephanite some points of interest may be salvaged from the description. The morphology of stephanite is in fair agreement with that attributed to dyscrasite in the older literature, but it bears no simple relation to the hexagonal structure found by Machatschki (1928) for natural and artificial dyscrasite. This suggests that the early measurements supposed to represent dyscrasite were actually made on associated crystals of stephanite.

In addition to the common and very evident twinning on (110) the crystals from Andreasberg show symmetrical striations on {110} suggesting twinning on (001). This twin law is established on stephanite which is therefore referred to the pyramidal class—*mm*2. Evidence was also found (Figs. 6 and 7) for twinning on (100). The absence of two symmetry planes limited the symmetry to the disphenoidal class—222. The x-ray extinctions noted, hkl with $h+k$ odd, $00l$ with l odd, are the same as those given for stephanite by Salvia. In the class 222 these extinctions admit only one space group, $C222_1$, which thus appears to be confirmed.

However, a new set of x-ray measurements on stephanite, recently made in this laboratory by Mr. E. D. Taylor of Laval University, revealed a further extinction condition which gives a unique space group in the class *mm*2 but is not compatible with the class 222. Without anticipating Mr. Taylor's interesting results, to be given in a forthcoming paper, the geometrical and röntgenographic results are reconciled by the following consideration, for which I am indebted to Professor J. D. H. Donnay: twinning on any one of the missing elements of symmetry in either of the merohedral orthorhombic classes gives one and the same twin orientation, and therefore the merohedral classes (*mm*2 and 222) cannot be distinguished by such twinning alone.

References

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