NOTES AND NEWS

A DISCUSSION: BIXBYITE—SITAPARITE—PARTRIDGEITE

In the September, 1942, issue of *The American Mineralogist* there appeared an abstract of a paper by B. Mason: "Bixbyite from Långban. The identity of bixbyite and sitaparite,"[1] and in a discussion of this paper Michael Fleischer proposes that the name sitaparite be dropped. As a result of a study of the Postmasburg manganese ores I am, however, of the opinion that the name, which is well-established, could with advantage be used to denote a manganese-iron sesquioxide whose composition falls between certain defined limits.

It may be of interest to give here the results of analyses of sitaparite from Postmasburg, carried out by Dr. C. F. J. van der Walt of the Division of Chemical Services. The analyzed specimens were polished on three sides and the amounts of the impurities (psilomelane and pyrolusite) estimated by inspection under the reflecting microscope. In the case of sample No. 1 these were judged at 1% and in the case of sample No. 2 at 2%. The latter contained in addition a fair percentage of ephesite (soda margarite), the bulk of which was removed by separation in methylene iodide prior to analysis. The reason for the low total of the analysis of sample No. 2 is thought to be due to the presence of residual ephesite.

ANALYSES OF SITAPARITE

No.	1	2
MnO_2	44.2	43.5
MnO	33.0	34.0
Fe_2O_3	21.9	19.3
SiO_2	0.1	0.5
CaO	0.2	0.1
BaO	0.1	0.2
	99.5	97.6

Sp. Gr. = 5.00

From the above analyses a formula of the type R_2O_3 may be deduced if the small percentages of MnO_2, which are in excess of the requirements of the formula, be regarded as representing admixed manganese peroxides. These percentages (3% in the case of No. 1 and 2% in the case of No. 2) agree satisfactorily with the amounts of psilomelane and pyrolusite estimated microscopically.

[1] *Geol. Fören. Förhandl.*, **64**, 117–125 (1942).

Determinations of Fe_2O_3 were made by van der Walt on two other samples of fairly pure sitaparite. Results of 14.4% and 25.6% Fe_2O_3 were obtained.

The Fe_2O_3 content of sitaparite thus varies between wide limits and a complete series apparently exists between this mineral and bixbyite. As the original bixbyite contains 47.98% Fe_2O_3, a logical distinction between the two minerals could be made on a basis of Fe_2O_3 content. I suggest that the name partridgeite[2] be applied to those manganese-iron sesquioxides containing less than 10% Fe_2O_3, sitaparite to the sesquioxides containing between 10% and 30% Fe_2O_3, and bixbyite to the mineral with more than 30% Fe_2O_3.

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It has been known for some years[3] that pure Mn_2O_3 has the same crystal structure as the mineral bixbyite, $(Mn,Fe)_2O_3$. It would have been reasonable to expect that naturally occurring material would show the entire range of composition. However, all the analyses of bixbyite until recently were made on material of pneumatolytic origin and all were very high (42–59%) in Fe_2O_3 content. Very recently Mason[4] showed that sitaparite from India with 27.6% Fe_2O_3 belongs to this series and also gave an analysis of material from Långban with only 21.9% Fe_2O_3. The gap down to nearly pure Mn_2O_3 has now been filled by the work of Gruner[5] and of de Villiers on material from Postmasburg, so that the series is known from essentially iron-free Mn_2O_3 to material with 59% Fe_2O_3. The upper limit of possible iron content is not known.

De Villiers suggests that three names be used for the series. Mason proposed that the name bixbyite be used for the entire series. He wrote: "... then the mineral name bixbyite may be defined precisely as including all specimens with manganese, iron, and oxygen as principal components, and having the same crystal lattice as the original bixbyite from Utah." Arguments can be advanced for both views. It seems to the writer to be chiefly a matter of convenience. As there are only six verified occurrences, the use of three names for the series seems to be an unnecessary elaboration. It is therefore recommended that the name sitaparite be dropped.

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[2] De Villiers, J. E., A preliminary description of the new mineral, partridgeite: *Am. Mineral.*, **28**, 336–338 (1943).

[3] Zachariasen, William, *Zeits. Krist.*, **67**, 455–401 (1928).
Pauling, Linus, and Shappell, M. D., *Zeits. Krist.*, **75**, 128–142 (1930).

[4] Mason, Brian, *Geol. För. Förh.*, **64**, 117–125 (1942).

[5] Gruner, J. W., *Am. Mineral.*, **28**, 174 (1943).