

## NEW MINERAL NAMES\*

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### Ferrobustamite

P. A. RAPOPORT, AND C. W. BURNHAM (1973) Ferro-bustamite: the crystal structures of two Ca, Fe bustamite-type pyroxenoids. *Z. Kristallogr.* **138**, 419-438.

Two samples, one a synthetic crystal of  $\text{CaFeSi}_2\text{O}_6$ , the other "iron rhodonite" from Skye, Scotland, are shown to have the structure of bustamite, not of rhodonite. They are triclinic, space group  $A1$  or  $A\bar{1}$ , with unit cells, resp.,  $a$  7.691, 7.832;  $b$  7.112, 7.229;  $c$  13.765, 13.925 Å,  $\alpha$  90°22', 90°1';  $\beta$  95°19', 95°24';  $\gamma$  103°58', 103°21'.

Analyses of the second sample by H. C. G. Vincent (in Tilley, *Am. Mineral.* **33**, 736-738 [1948]) gave  $\text{SiO}_2$  50.00, FeO 9.29, MnO 1.22, CaO 38.66, MgO none, insol. 0.45, sum 99.82 percent. It had  $G$ . 3.09,  $\alpha$  1.640,  $\gamma$  1.653,  $2V = -60^\circ$ ,  $X' \wedge c = 44^\circ$  in section perpendicular to the zone of cleavages. A new probe analysis gave  $\text{SiO}_2$  53.30, FeO 10.44, MgO 0.06, MnO 1.58, CaO 34.63, sum 100.01 percent. These correspond, respectively to  $\text{Ca}_{1.58}\text{Fe}_{0.38}\text{Mn}_{0.04}\text{Si}_2\text{O}_6$ .

The limits of solid solution are discussed; the data of Rutstein (*Am. Mineral.* **56**, 2040-2052) indicate that ferrobustamite can take up more Fe than wollastonite.

### Ortho-armalcolite, Para-armalcolite

S. E. HAGGERTY (1973) Ortho and para-armalcolite samples in Apollo 17. *Nature Phys. Sci.* **242**, 123-125.

Two paragenetically contrasting forms of armalcolite (*Am. Mineral.* **55**, 2136) are present in basalts from the Apollo 17 landing site. "These differ in optical properties,

in crystal habit, and in distribution between coarse and fine-grained rocks."

The name ortho-armalcolite is used for the blue-gray mineral found in fine-grained and vitrophyric basalts. The name para-armalcolite is proposed for tan euhedral crystals occurring in medium- to coarse-grained basalts, strongly anisotropic in reflected light and of a slightly higher reflectivity than ortho-armalcolite.

The two forms are compositionally indistinguishable (ranges and averages of probe analyses are given). The ortho-form is considered to be a primary crystallization product, the para-form to be the result of the decomposition of a pre-existing solid solution. "I do not intend at this stage to suggest that ortho and para-armalcolite are different minerals, although this may indeed turn out to be the case when X-ray crystallographic studies are complete."

### Discussion

The proposal is a disservice to mineralogical nomenclature; in the absence of definitive X-ray data, armalcolite, type I and type II, would have been adequate interim terms.

### Sapphirine-1Tc

STEFANO MERLINO (1973) Polymorphism in sapphirine. *Contrib. Mineral. Petrol.* **41**, 23-29.

Sapphirine from granulites near Wilson Lake, Labrador, is triclinic,  $a$  10.04,  $b$  10.38,  $c$  8.65 Å,  $\alpha$  107°33',  $\beta$  95°07',  $\gamma$  123°55', hence a polymorph of normal sapphirine (= sapphirine - 2M), which is monoclinic,  $a$  9.783,  $b$  14.401,  $c$  9.1929 Å,  $\beta$  110°17'.

## NEW DATA

### Dimorphite

LEAH S. FRANKEL, AND TIBOR ZOLTAI (1973) Crystallography of dimorphites. *Z. Kristallogr.* **138**, 161-166.

Re-examination of a sample of Vesuvian dimorphite showed that crystals of two distinct types are present (see Dana's *System*, 7th ed., v. 1, p. 197). Dimorphite I (identical with synthetic  $\text{As}_4\text{S}_8$ ) has space group  $Pnma$  or  $Pn2_1$ ,  $a$ ,  $a$  9.07,  $b$  8.01,  $c$  10.30 Å, strongest lines 6.27 **50** 011, 5.16 **100** 111, 4.16 **40** 201, 3.12 **62** 212, 2.96 **50** 122. Dimorphite II has space group  $Pnma$  or  $Pn2_1a$ ,  $a$  11.24,  $b$  9.90,  $c$  5.56 Å,  $Z = 4$ ,  $G$  3.60 calc, 3.58 meas, strongest lines 4.89 **100** 111, 210, 020; 3.91 **40** 211; 214 **50** 241, 430; 1.620 **50** 143, 541, 423.

\* Minerals marked with an asterisk after the name were approved before publication by the Commission on New Minerals and Mineral Names, International Mineralogical Association.

### Garrelsite

H. H. ULBRICH, AND D. GHOSE (1973) A note on the chemical composition of the silicoborate garrelsite. *Schweiz. Mineral. Petrogr. Mitt.* **53**, 199-202.

S. GHOSE, AND H. H. ULBRICH (1973) The crystal structure of garrelsite,  $\text{NaBa}_3\text{Si}_2\text{B}_7\text{O}_{18}(\text{OH})_4$ . *Naturwissenschaften*, **60**, 349-350.

Analysis by electron microprobe gave BaO 51.52 ± 0.30, Na<sub>2</sub>O 3.33 ± 0.20, SiO<sub>2</sub> 13.81 ± 0.30 percent. A new analysis by B. Ingram gave Na<sub>2</sub>O 3.5 percent. Ca and Mg, reported in the original analysis, were absent in inclusion-free samples. These data lead to the formula  $\text{Ba}_3\text{NaSi}_2\text{B}_7\text{O}_{18}(\text{OH})_4$ .

Garrelsite is monoclinic, space group  $C2/c$ ,  $a$  14.639,  $b$  8.466,  $c$ , 13.438 Å,  $\beta$  114.21°,  $Z = 4$ . It contains a pentaborate polyanion ( $\text{B}_5\text{O}_{12}$ )<sup>-</sup>.

**Lovozerite\***

YU. L. KAPUSTIN, A. V. BYKOVA, AND Z. V. PODUVKINA (1973) Mineralogy of the lovozerite group. *Izvest. Akad. Nauk. SSSR, Ser. Geol.* no 8, 106–12 (in Russian).

New occurrences of unaltered material were found in alkaline rocks of the Khiline massif, Kola Peninsula. Two new analyses give the formula  $(\text{Na}, \text{Ca})_3(\text{Zr}, \text{Ti})\text{Si}_6(\text{O}, \text{OH})_{18}$ . X-ray study showed that the mineral was not monoclinic, as previously reported, but rhombohedral, space group  $R\bar{3}m$ ,  $R32$ , or  $R\bar{3}m$ ,  $a_{rh} = 7.32$ ,  $\alpha = 88^\circ 04'$ , or  $a 10.18$ ,  $c 13.10 \text{ \AA}$ .

**Nuffieldite**

IWAO KOHATSU, AND B. J. WUENSCH (1973) The crystal structure of nuffieldite,  $\text{Pb}_2\text{Cu}(\text{Pb}, \text{Bi})\text{Bi}_2\text{S}_7$ . *Z. Kristallogr.* **138**, 343–365.

Nuffieldite was described by Kingston (*Am. Mineral.* **54**, 574) as  $\text{Pb}_{10}\text{Cu}_4\text{Bi}_{10}\text{S}_{27}$ . New study shows the mineral to be orthorhombic, space group  $Pbnm$  (or  $Pbn2_1$ ),  $a 14.387$ ,  $b 21.011$ ,  $c 4.046 \text{ \AA}$ . These space groups require 8 or 4 equipoints, resp., so that the formula is modified to  $\text{Pb}_2\text{Cu}(\text{Pb}, \text{Bi})\text{Bi}_2\text{S}_7$ .

**Khuniite-Hemihedrite**

FRANZ PERTLIK (1973) The probable identity of hemihedrite and "khuniite." *Neues Jahrb. Mineral. Monatsh.*, p. 233–235 (in German).

Khuniite was first described in 1970 (*Am. Mineral.* **55**,

**Tundrite**

Z. V. ZHLYUKOVA, E. V. VLASOVA, M. E. KAZAKOVA, G. O. PILOYAN, N. G. SHUMYATSKAYA, AND B. E. BORUTSKII (1973) New data on tundrite. *Dokl. Akad. Nauk SSSR*, **211**, 426–429 (in Russian).

Infra-red study of tundrite from a new locality in the Khibina massif showed bands of carbonate; this was confirmed by spectra of the Greenland mineral (*Am. Mineral.* **53**, 1780). The mineral is therefore a carbonate-silicate. A new analysis by M. E. K. gave  $\text{SiO}_2$  10.21,  $\text{TiO}_2$  10.29,  $\text{Nb}_2\text{O}_5$  4.90,  $\text{Fe}_2\text{O}_3$  0.24,  $\text{CaO}$  1.26,  $\text{ThO}_2$  0.20,  $\text{TR}_2\text{O}_3$  50.96,  $\text{Na}_2\text{O}$  6.92,  $\text{K}_2\text{O}$  0.36,  $\text{H}_2\text{O}^-$  none,  $\text{H}_2\text{O}^+$  3.75,  $\text{CO}_2$  10.85, sum 99.94 percent, corresponding to  $(\text{Na}_{2.67}\text{K}_{0.09})(\text{TR}_{3.69}\text{Ca}_{0.26}\text{Fe}_{0.03}\text{Th}_{0.01})(\text{Ti}_{1.54}\text{Nb}_{0.44})\text{Si}_{2.03}\text{O}_8(\text{C}_{2.95}\text{O}_9)\text{O}_4(\text{OH})\cdot 2\text{H}_2\text{O}$ , or  $(\text{Na}, \text{K})_3(\text{TR}, \text{Ca})_4(\text{Ti}, \text{Nb})_2(\text{SiO}_4)_2(\text{CO}_3)_3\text{O}_4(\text{OH})\cdot 2\text{H}_2\text{O}$ . X-ray study showed the mineral to be triclinic,  $a 7.51$ ,  $b 13.84$ ,  $c 5.04 \text{ \AA}$ ,  $\alpha 98^\circ 00'$ ,  $\beta 70^\circ 40'$ ,  $\gamma 99^\circ 00'$ , close to previous data. DTA and TGA curves are given.

**Note**

Rare earth compositions are not given, so it is uncertain whether this is tundrite or tundrite-(Nd).

**DISCREDITED MINERALS**

1813); new data were published in 1972, when it was pointed out (*Am. Mineral.* **58**, 562) that it was probably identical with hemihedrite. Pertlik has re-examined khuniite from the type locality and finds the unit cell constants to be identical within the limits of error with those of hemihedrite.