

## NEW MINERAL NAMES

### Perite

MARIANNE GILLBERG. Perite, a new oxyhalide mineral from Långban, Sweden. *Arkiv Mineral. Geol.*, 2, No. 44, 565-570 (1960).

The mineral occurs in the Råmen drift (130 m. level) as sulfur-yellow plates about 0.5 mm. in size in fissures in a skarn of hausmannite, calcite, a ludwigite-like mineral, and a few crystals of a red unidentified mineral. Analysis by Alexander Parwel gave  $\text{PbCl}_2$  26.33,  $\text{PbO}$  23.69,  $\text{Bi}_2\text{O}_3$  45.74,  $\text{MnO}$  0.46,  $\text{CaO}$  1.44,  $\text{MgO}$  0.07,  $\text{CO}_2$  1.19,  $\text{H}_2\text{O}^-$  0.04,  $\text{H}_2\text{O}^+$  0.10, insol. 1.00, sum 100.06%. After deducting calcite and hausmannite, the unit cell content is  $\text{Pb}_{4.03}\text{Bi}_{3.94}\text{O}_{7.93}\text{Cl}_{3.80}(\text{OH})_{0.22}$  or  $\text{PbBiO}_2\text{Cl}$ , the Bi analogue of nadorite. Easily soluble in dilute acids. The mineral is sulfur-yellow with adamantine luster.  $G$ .  $8.00 \pm 0.01$ , corrected for impurities 8.16.  $H$ . 3. Does not fluoresce in long- or short-wave ultraviolet radiation. Habit tabular. Cleavage relatively distinct perpendicular to the  $c$ -axis. The  $n$  could not be determined because the mineral reacts with S-Se melts, but is probably above 2.4.

Weissenberg and Guinier photographs gave for natural and synthetic perite, respectively, orthorhombic,  $a$   $5.627 \pm 0.05$ ,  $5.593 \pm 0.002$ ;  $b$   $5.575 \pm 0.02$ ,  $5.558 \pm 0.002$ ;  $c$   $12.425 \pm 0.09$ ,  $12.428 \pm 0.008$  Å.; these are very close to the data for nadorite. Space group *Bmmb*. Indexed  $x$ -ray powder data are given; the strongest lines for the mineral are 2.86 (10) (113), 1.620 (9) (133, 313), 3.77 (8) (111), 1.251 (420, 240).

The mineral was synthesized by fusing  $\text{PbO}$  and  $\text{Bi}_2\text{O}_3$  with an excess of  $\text{BiCl}_2$ , and leaching the excess  $\text{PbCl}_2$  with cool water.

The name is for Per Geijer, Swedish geologist.

MICHAEL FLEISCHER

### Freudenbergite

GERHARD FRENZEL. Ein neues Mineral: Freudenbergit.  $(\text{Na}_2\text{Fe}_2\text{Ti}_7\text{O}_{18})$  *Neues Jahrb. Mineral., Monatsh.* 1961, No. 1, 12-22.

The mineral occurs in an apatite-rich alkali syenite from Michelsberg, Katzenbuckel, Odenwald, as small, mainly xenomorphic grains averaging 0.15 mm. long, 0.05 mm. thick. The rock contains sanidine 62 vol. %, diopside-aegirine pyroxene 15, apatite 11, amphibole 6, zeolitized feldspar 4, freudenbergite 2, plus traces of biotite, hematite, ilmenite, and sphene. Freudenbergite occasionally occurs in parallel intergrowths with hematite.

The mineral was purified by treatment with cold 40% HF for 4 days (the mineral was only slightly attacked) followed by separation with bromoform. Two analyses were made by Fresenius and Schneider, after dissolving by boiling repeatedly with  $\text{HF-H}_2\text{SO}_4$  and fusion with  $\text{KHSO}_4$ . Loss on ignition (thought to be high because of the presence of material decomposed by the HF treatment) and  $\text{SiO}_2$  were determined on a separate portion. FeO was not determined and may have been present. Analyses gave  $\text{Na}_2\text{O}$  6.90, 7.15;  $\text{K}_2\text{O}$  1.33, 0.37;  $\text{MnO}$  0.26, 0.14;  $\text{MgO}$  0.47, n.d.;  $\text{Fe}_2\text{O}_3$  18.94, 20.19;  $\text{Al}_2\text{O}_3$  0.47, n.d.;  $\text{TiO}_2$  63.62, 64.43;  $\text{Nb}_2\text{O}_5$  2.73, 2.97;  $\text{SiO}_2$  2.03, ign. loss 2.98, sum 99.73, 100.26%. These correspond closely to  $\text{Na}_2\text{Fe}_2(\text{Ti}_{6.81}\text{Nb}_{0.19})\text{O}_{18}$ . Spectrographic analysis showed traces of Cd, Cu, Ca, Sr, Ba, but no Ta.

Guinier photographs and powder data show freudenbergite to be hexagonal,  $a$  9.62,  $c$  22.40 Å,  $c/a=2.328$ . With d. detd.  $\sim 4.3$ ,  $Z=5.89$  or 6, d. calcd. = 4.38. The unit cell is close to that of hoegbomite, but the  $x$ -ray powder data for the two minerals differ considerably. Indexed  $x$ -ray powder data are given for freudenbergite; the strongest lines are 3.627 (vs) ( $11\bar{2}4$ ), 1.911 (s-vs) ( $23\bar{5}0$ ), 5.81 (s) (0004), 3.101 (s) ( $12\bar{3}1$ ), 3.015 (s) ( $12\bar{3}2$ ), 2.731 (s) ( $12\bar{3}4$ ), 2.712 (s) ( $30\bar{3}2$ ), 2.069 (s) ( $40\bar{4}1$ ), 2.049 (s) ( $13\bar{4}5$ ), 1.596 (s) ( $40\bar{4}9$ ). Cleavage basal and prismatic good.

Color blackish, rutile-like, olive- to steel-gray in fine powder, streak pale yellow-brown; under the microscope transparent, O dark-brown, E yellow-brown. Optically uniaxial, positive,  $n_s$  (Li, in S-Se melts)  $o \sim 2.37$ ,  $e \sim 2.42$ . Reflecting power in air  $R_o$  16.5,  $R_e$  17.2% in oil ( $n$  1.515)  $R_o$  4.8,  $R_e$  5.3%. Yellow-brown internal reflections; weakly anisotropic under crossed nicols. The mineral polishes well; the abrasion hardness is less than that of hematite and diopside.

Freudenbergite is considered to be of late magmatic origin.

The name is for the late Professor Wilhelm Freudenberg, who studied the Katzenbuckel rocks.

DISCUSSION.—Not clearly related to any known mineral, perhaps best placed with the multiple oxides near hoegbomite.

M. F.

### Kennedyite, Karrooite

O. VON KNORRING AND K. G. COX. Kennedyite, a new mineral of the pseudobrookite series: *Mineralog. Mag.*, **32**, 676–682 (1961).

The mineral occurs in a sill at the base of the Karroo volcanic succession, Mateke Hills, Southern Rhodesia, in lath-shaped crystals up to 2 mm. in length in a ground-mass of alkali feldspar. Phenocrysts of olivine and clinopyroxene are also present. Analysis of material purified by magnetic and heavy liquid separations gave (O. v. K., analyst): TiO<sub>2</sub> 60.33, Al<sub>2</sub>O<sub>3</sub> 2.15, Fe<sub>2</sub>O<sub>3</sub> 28.77, Cr<sub>2</sub>O<sub>3</sub> 0.37, FeO 2.00, MnO 0.07, MgO 6.45, CaO trace, sum 100.14%. This corresponds to Mg<sub>0.69</sub>Fe<sup>+2</sup><sub>0.12</sub>Fe<sup>+3</sup><sub>1.56</sub>Al<sub>0.18</sub>Cr<sub>0.03</sub>Ti<sub>3.27</sub>O<sub>10</sub> or approximately MgFe<sup>+3</sup>Ti<sub>3</sub>O<sub>10</sub>, *i.e.*, derived from pseudobrookite by the substitution of MgTi for 2Fe<sup>+3</sup>. Spectrographic analysis also showed traces of Si, Ca, V, Ni, Ga, and Zr.

Indexed *x*-ray powder data are given. The strongest lines of kennedyite are 3.485 (vs) (220, 101), 4.88 (s) (200), 2.743 (s) (230), 1.865 (s) (002), 2.450 (m) (301), 1.970 (m) (331), 1.544 (m). From the powder data, the unit cell has  $a$  9.77,  $b$  9.95,  $c$  3.73 Å.

Kennedyite is black, in small grains dark brown, translucent. Luster metallic, brilliant.  $G$ . (suspension) 4.07. Extinction parallel. In polished section at high magnification, lamellar intergrowths (exsolved rutile?) were seen. Pleochroism not apparent. Under crossed nicols steel-gray to purplish-brown anisotropic effects were noted.

The name is for Professor W. Q. Kennedy of the University of Leeds. The name karrooite is suggested for the end-member MgTi<sub>3</sub>O<sub>10</sub>, one of the major components of the mineral kennedyite.

DISCUSSION.—The nomenclature of intermediate compounds is always difficult. Pseudobrookite, Fe<sub>4</sub><sup>+3</sup>Ti<sub>2</sub>O<sub>10</sub>, is the only end-member of this group that occurs naturally; others that have been named are Al<sub>4</sub>Ti<sub>2</sub>O<sub>10</sub> (tielite), Ti<sub>4</sub>Ti<sub>2</sub>O<sub>10</sub> (anosovite), and now karrooite (Mg<sub>2</sub>Ti<sub>4</sub>O<sub>10</sub>); these have been synthesized and have also been found in Ti-rich furnace slags. None of these should have been given mineral names. There is no satisfactory way of naming the intermediate member of a heteromorphic substitution series, such as kennedyite is, and further new names should be avoided if possible, if additional intermediate members of slightly different composition are found.

M. F.

### Nickelemelane, Cobaltomelane, Nickel-cobaltomelane, Cryptonickelmelane, Alumocobaltomelane, Buryktalskite

I. I. GINZBERG AND I. A. RUKAVISHNIKOVA. Minerals of the ancient crust of weathering in the Urals. Oxides and hydroxides of manganese: *Izdel'svo Akad. Nauk S.S.S.R.*, **1951**, 92–130 (in Russian).

- K. K. NIKITIN. Manganese minerals of the crust of weathering of the Buryktal ultrabasic massif: *Kora Vyvetrivaniya*, **3**, 39-55 (1960) (in Russian).
- I. I. GINZBURG. Nickele- and cobalto-melanes: *Kora Vyvetrivaniya*, **3**, 56-66 (1960) (in Russian).

These are studies of manganese oxides formed by the weathering of ultrabasic rocks in the Urals. Many new analyses were given, with *x*-ray powder data, optical study, and D.T.A. New names used are listed above; they are not specifically defined, but nickelmelanes contain NiO 3.68 to 15.50% with a max. of .045% CoO; nickel-cobaltomelane with Ni > Co, but with high (up to 5.6% CoO); cobaltomelanes with Co > Ni; aluminocobaltomelanes with Co > Ni and a high content of Al<sub>2</sub>O<sub>3</sub> (up to 11%); cryptonickelmelane, close in composition and *x*-ray powder diagram to cryptomelane, but containing much NiO (up to 4.8%) and CoO (up to 2.0%).

The analyses assigned these names differ greatly; so do the *x*-ray powder patterns. The authors recognize that the samples are mixtures; the *x*-ray patterns include lines of goethite, cryptomelane, and "elizavetinskite" (see below). Ginzburg subtracts these and defines as the pattern of the new mineral "buryktalskite" the lines at 4.88 (10), 4.66 (10), 4.61 (10), 1.482 (10), 9.17 (7), 3.09 (7), 1.834 (7), 1.689 (7).

DISCUSSION.—These are obviously not names of minerals, but of complex mixtures. They undoubtedly do contain one or more new minerals, but what these are remains unknown. Many of the lines attributed to "buryktalskite" can be assigned to strong lines of pyrolusite, lithiophorite, or cryptomelane; others cannot be assigned with any confidence. The names are therefore, like limonite and asbolane, merely mineralogical waste baskets.

M. F.

#### Elizavetinskite

- V. I. MIKHEEV. X-ray methods of determining minerals: *Gosgeoltekhizdat* **1957**, 868 pp. (p. 409) (in Russian).
- I. I. GINZBURG. Nickele- and cobaltomelanes: *Kora Vyvetrivaniya*, **3**, 56-66 (in Russian).

The name is given to a black, powdery sample in clay from the Elizavetinsk deposit, Sverdlovsk region, for which *x*-ray powder data are given. The strongest lines are 4.75 (10), 2.350 (10), 1.872 (10), 1.442 (7), 9.68 (6), 1.380 (6), 1.235 (6). These are interpreted as giving an orthorhombic unit cell with *a* 3.725, *b* 12.38, *c* 9.455 Å. The formula is assumed to be (Mn, Co) O(OH). Mikheev states that the *x*-ray pattern is close to that of lithiophorite.

Ginzburg recognizes that some of his analyzed samples give *x*-ray patterns close to those of elizavetinskite and suggests that the formula should be (Mn, Co, Ni) O (OH).

DISCUSSION.—The name has no standing. Every strong line of the *x*-ray pattern corresponds closely to the published data for lithiophorite, a mineral known to contain appreciable amounts of cobalt and nickel. Detailed discussion will be published elsewhere.

M. F.

#### Behierite

- J. BEHIER. Travaux mineralogiques. *Rep. Malgache, Rapport Annual Serv. Geol.* **1960**, 181-199.

A preliminary note. Two small crystals in albite and associated with rubellite were found in the pegmatite at Manjaka, Madagascar, and were thought to be zircon or xenotime. X-ray study by Miss Mary E. Mrose of the U. S. Geological Survey indicates that

the mineral is a tantalum borate, presumably  $TaBO_4$ . The name is for Jean Behier, mineralogist of the Service géologique, Madagascar.

DISCUSSION.—Names should not be published without data.

M. F.

#### Orthopinakiolite

REIN RANDMETS. Orthopinakiolite, a new modification of  $Mg_3Mn^{+2}Mn^{+3}B_2O_{10}$  from Långban, Sweden. *Arkiv Mineral., Geol.*, 2, No. 42, 551–555 (1960).

Bäckstrom (*Geol. Fören. Föhr.*, 17, 257–259 (1895)) described orthorhombic pinakiolite from Långban; his analysis (No. 3, p. 325, Dana's System, 7th Ed., Vol. II) gave the same composition as for monoclinic pinakiolite. Re-examination of 150 samples of pinakiolite in the Swedish Museum of Natural History showed that 12 were orthorhombic, prismatic. Like the tabular monoclinic pinakiolite, they occur in granular dolomite with hausmannite and manganophyllite. The dimorphs were not found together, although Bäckstrom reports that they do occur together. Weissenberg photographs gave the unit cell as  $a 18.45 \pm 0.3$ ,  $b 12.70 \pm 0.2$ ,  $c 6.07 \pm 0.1$  Å.,  $Z=8$ .  $G. 4.03$ . (3.935 Bäckstrom). The space group is  $Pnn2$  or  $Pnmm$ . Indexed x-ray powder data are given; the strongest lines of orthopinakiolite are 2.59 (10) (710, 341); 5.17 (9) (111), 2.52 (9) (531, 621, 150); 2.03 (9) (821, 103); 2.20 (8) (721, 351, 142); 1.523 (8) (281, 12.0.0, 181).

The mineral is considered to be a member of the ludwigite-vonsenite group (erroneously given as ludwigite-paigeite group), but  $a$  and  $c$  of orthopinakiolite are approximately double  $a$  and  $c$  of the group.

M. F.

#### Strontiorborite

V. V. LOBANOVA. A new borate—strontiorborite: *Doklady Akad. Nauk S.S.S.R.*, 135, 173–175 (1960).

The mineral was found in a study of the residue insoluble in water of the saline Kungur strata of the near-Caspian region (could this be the Inder region? M.F.). It occurs as small colorless plates, mostly 0.10–0.15 mm., but up to 2 mm. Biaxial with very large 2 V (about  $85^\circ$ ), usually positive, but sometimes negative, elongation positive and negative, extinction inclined, so probably monoclinic;  $ns$  (all  $\pm 0.002$ ),  $\alpha 1.470$ ,  $\beta 1.510$ ,  $\gamma 1.579$  (these correspond to a positive mineral, with 2 V about  $78^\circ$ . M.F.). The mineral is very brittle.

Analysis by M. M. Vil'ner gave  $B_2O_3$  57.85, CaO 4.15, SrO 21.66, MgO 5.75,  $H_2O$  11.52, sum 100.93%, which corresponds closely to  $4(Sr, Ca)O \cdot 2MgO \cdot 12B_2O_3 \cdot 9H_2O$ , with Sr:Ca = 3:1.

Unindexed x-ray powder data by V. I. Appolonov are given (102 lines). The strongest lines are 7.33 (10), 4.09 (8), 3.50 (7), 3.32 (7), 3.06, (6) 2.033 (6) (not stated whether Å or kX).

The mineral occurs in rock salt with fine-lamellar structure due to the layered distribution of the fine-grained borates boracite, strontiorborite, and halurgite ("galurgit"—I can't identify this. M. F.). Anhydrite is also present.

DISCUSSION.—Requires verification. Some of the data could be construed as indicating a mixture of strontionorite, boracite, and anhydrite.

M. F.

#### Unnamed

F. T. INGHAM AND E. F. BRADFORD, The geology and mineral resources of the Kinta Valley, Perak Federation of Malaya, *Geol. Survey District Mem. No. 9*, 1–347 (1960) (see p. 105).

A yellow coating on cassiterite crystals from Sungei Lah section, Chenderiang, contained varlamoffite and another secondary mineral of the approximate composition "CaO·SnO·SiO<sub>2</sub>." Analysis gave CaO 19.14, SnO<sub>2</sub> 58.48, SiO<sub>2</sub> 21.26, loss on ignition 0.50, sum 99.38%. (This corresponds to 0.95 CaO·1.07 SnO<sub>2</sub>·0.98 SiO<sub>2</sub>. M.F.).

The mineral is pale yellow to colorless, translucent. G.  $4.3 \pm 0.2$  (Berman balance), H.  $3\frac{1}{2}$ –4. Optically biaxial, negative,  $n_s \alpha$  1.765,  $\beta$  1.784,  $\gamma$  1.799 (all  $\pm .003$ ), 2V (Universal Stage)  $85 \pm 2^\circ$ . From the optics, it is monoclinic or triclinic. The mineral fluoresces yellowish-green under short-wave UV light.

Thin-section study indicates that the mineral was formed by hydrothermal alteration of a cassiterite-quartz assemblage.

M. F.

#### Innelite

YU. A. BALASHOV AND N. V. TURANSKAYA. The lanthanum maximum of the rare earths in lamprophyllite. *Geokhimiya* 1960, No. 7, p. 618–623 (in Russian).

Mention is made of a new barium silicate named innelite, to be described by S. M. Kravchenko. It is from pegmatite, Inagli massif, central Aldan, and contains BaO about 40%. Of the total rare earths, La is 64%, Ce 31%, and Nd 4.5%.

M. F.

#### NEW DATA

##### Dachiardite

GLAUCO GOTTARDI. Sul dimorfismo mordenite-dachiardite: *Periodico Mineralogia (Roma)*, 29, p. 183–191 (1960).

A new analysis of dachiardite from Elba gave SiO<sub>2</sub> 63.00, Al<sub>2</sub>O<sub>3</sub> 14.78, Fe<sub>2</sub>O<sub>3</sub> trace, CaO 5.10, SrO trace, MgO 0.21, K<sub>2</sub>O 1.77, Na<sub>2</sub>O 1.81, H<sub>2</sub>O<sup>110</sup> 2.69, H<sub>2</sub>O<sup>400</sup> 8.87, H<sub>2</sub>O<sup>900</sup> 1.18, sum 99.41%. This corresponds to the formula



or



G. calcd. 2.138, measured 2.206. Dachiardite is therefore a dimorph of mordenite.

M. F.

##### Corrensite

J. L. MARTIN VIVALDI AND D. M. C. MACÉWAN. Corrensite and swelling chlorite: *Clay Minerals Bull.*, 4, 173–181 (1960).

A useful review is given of the various materials that have been described as corrensite. The suggestion is made that the name corrensite be restricted to a 1:1 regularly interstratified chlorite—"swelling chlorite." The nature of "swelling chlorite" is discussed; it appears to be distinct from vermiculite and the montmorillonites.

M. F.

#### DISCREDITED MINERALS

##### Namaqualite (=Kyanotrichite)

BRIAN MASON. The identity of namaqualite with kyanotrichite. *Mineralog. Mag.*, 32, 737–738 (1961).

Optical and *x*-ray study of a sample labelled "namaqualite," that had been supplied by J. R. Gregory, who sent the type material to A. H. Church (1870), showed it to be kyanotrichite. The original analysis agrees with kyanotrichite except that SO<sub>3</sub> was not reported. The original analysis gave H<sub>2</sub>O 32.38%; the formula of kyanotrichite requires H<sub>2</sub>O 22.4, SO<sub>3</sub> 12.4; probably in the original analysis, loss on ignition was determined.

M. F.

#### Ampangabeite (= Samarskite)

L. VAN WAMBEKE. Etude comparative de l'ampangabeite et de la samarskite: *Bull. soc. franc. mineral. crist.*, **83**, 295-309 (1960).

Samples were examined of samarskites from 7 localities and of 6 amphangabeites from 4 localities, including the type locality. *X*-ray powder data (after ignition), D.T.A. curves, and *x*-ray fluorescence analyses are given. Ampangabeite is identical with samarskite. Weathered outer zones of the mineral show leaching of Y, U, Ca, and other rare earths and sometimes are enriched in Pb.

M. F.