

## NEW MINERAL NAMES\*

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### Antitaenite

D.G. Rancourt, R.B. Scorzelli (1995) Low-spin  $\gamma$ -Fe-Ni ( $\gamma_{LS}$ ) proposed as a new mineral in Fe-Ni-bearing meteorites: Epitaxial intergrowth of  $\gamma_{LS}$  and tetrataenite as a possible equilibrium state at ~20–40 at% Ni. *Jour. Magnetism Magnetic Materials*, 150, 30–36.

The meteoritic paramagnetic Fe-Ni phase detected by Mössbauer spectroscopy is proposed to be a low-spin phase that always occurs in close microstructural association with tetrataenite. The low-spin phase is suggested to contain ~25–30 wt% Ni and to have the same cell parameter as tetrataenite, thus accounting for the lack of X-ray detection in meteoritic samples. Etched taenite showing a two-phase intergrowth in the Saint Séverin LL6 chondrite is proposed to be an intergrowth of the low-spin phase and tetrataenite. Because the low-spin phase is a taenite distinguishable by its antiferromagnetism, the new name antitaenite has been proposed.

**Discussion.** The proposal has not been submitted to the CNMMN for a vote. J.L.J.

### Mg-dominant asbolane

A.I. Gorshkov, Yu.A. Bogdanov, A.V. Sivtsov, A.V. Mokhov (1995) A new Mg-Al-Ni asbolane. *Doklady Akad. Nauk*, 342(6), 781–784 (in Russian).

Energy-dispersion analyses of several grains (mean of 12 analyses, normalized to 100 wt%) gave MgO 9.96, Al<sub>2</sub>O<sub>3</sub> 4.12, K<sub>2</sub>O 0.69, CaO 2.06, MnO 76.83, NiO 6.34, corresponding to the structural formula  $[\text{Mn}^{4+} \text{O}_{1.6} (\text{OH})_{0.4}]^{0.4+} [(\text{Mg}_{0.28} \text{Al}_{0.09} \text{Ni}_{0.1}) \text{Ca}_{0.04} \text{K}_{0.02} (\text{OH})_{1.53}]^{0.4-} \cdot n\text{H}_2\text{O}$ , in which OH exists by analogy with that in other asbolanes. Electron diffraction study showed the structure to consist of two hexagonal sublattices, with  $a = 2.83$ ,  $c = 9.30$  Å, and  $a = 3.03$ ,  $c = 9.30$  Å (referred to as I and II, respectively). The structure has ordered layers (ABAB), with  $a$  of sublattice I corresponding to octahedron layers filled with Mn<sup>4+</sup>, whereas II contains the larger cations (Mg, Ni, and presumably Al); the length of  $c$  equals the sum of the thicknesses of the I and II layers. Electron diffraction patterns also showed a practically uninterrupted gradation from asbolane to busenite (= 10 Å man-

ganite). The mineral occurs in manganiferous crusts recovered by the drilling vessel JOIDES Resolution at the Wodejebato guyot in the northwestern Pacific Ocean. N.N.P.

### K-barytolamprophyllite

R.K. Rastsvetaeva, V.G. Evsyunin, A.A. Konev (1995) Crystal structure of K-barytolamprophyllite. *Krystallografiya*, 40(3), 217–219 (in Russian).

The mineral occurs as light brown, nonpleochroic, lamellar crystals, 0.1–0.5 mm, in syenitic pegmatite in the Murunsk massif, Yakutia, Russia. Electron microprobe analyses (not given) correspond to  $(\text{K}_{0.98} \text{Ba}_{0.84} \text{Sr}_{0.21})_{22.03} [\text{Na}(\text{Na}_{1.2} \text{Fe}_{0.41} \text{Mn}_{0.42} \text{Ca}_{0.27})_{22.3} (\text{TiO}_2)_{1.26}] [(\text{Si}_2\text{O}_7)_2 \text{Ti}_2\text{O}_2]$ . Single-crystal X-ray structure study ( $R = 0.0345$ ) indicated monoclinic symmetry, space group  $C2/m$ ,  $a = 20.086(8)$ ,  $b = 7.099(3)$ ,  $c = 5.411(1)$  Å,  $\beta = 96.65(3)^\circ$ ,  $D_{\text{calc}} = 3.61$  g/cm<sup>3</sup> for  $Z = 2$ .

**Discussion.** Corresponds to the K analog (K > Ba) of barytolamprophyllite. The mineral and new name have not been submitted to the CNMMN for a vote. J.L.J.

### K-Cr priderite

Huyun Zhou, Qi Lu (1994) K-Cr priderite—A new facies of the priderite series found in the Mengying kimberlite, Shandong Province—II. Ti, Cr, Fe oxide minerals containing LIL elements in the upper mantle. *Acta Mineral. Sinica*, 14(3), 234–240 (in Chinese, English abs.).

The mineral occurs as irregular-shaped particles, generally 20–50  $\mu\text{m}$  and up to 100  $\mu\text{m}$  across, in microfractures in mathiasite, which is a minor constituent of the Mengying kimberlite, Shandong Province, China. Electron microprobe analyses (given to three decimal places) of ten grains gave SiO<sub>2</sub> 0.000–0.678, Al<sub>2</sub>O<sub>3</sub> 0.000–0.240, TiO<sub>2</sub> 58.170–67.648, FeO 1.838–5.594, MgO 0.110–0.938, K<sub>2</sub>O 6.453–8.834, Na<sub>2</sub>O 0.162–0.520, CaO 0.000–0.015, BaO 1.998–7.768, ZrO<sub>2</sub> 0.843–2.574, SrO 0.000–0.308, MnO 0.000–0.460, V<sub>2</sub>O<sub>5</sub> 0.765–1.652, Nb<sub>2</sub>O<sub>5</sub> 0.230–1.212, La<sub>2</sub>O<sub>3</sub> 0.000–2.051, Ce<sub>2</sub>O<sub>3</sub> 0.000–0.628, Ta<sub>2</sub>O<sub>5</sub> 0.000–0.995, ZnO 0.000–0.413, sum 98.404–101.929 wt%; the average corresponds to  $(\text{K}_{1.256} \text{Ba}_{0.241} \text{Na}_{0.085} \text{La}_{0.046})_{21.628} (\text{Cr}_{1.317} \text{Fe}_{0.321} \text{Mg}_{0.085} \text{V}_{0.093})_{21.816} (\text{Ti}_{6.015} \text{Zr}_{0.075} \text{Nb}_{0.029})_{26.119} \text{O}_{16}$ , simplified as  $\text{K}_2\text{Cr}_2\text{Ti}_6\text{O}_{16}$ , which is the Cr analog of priderite and the K analog of redledgeite ( $\text{K}_2\text{Fe}_2\text{Ti}_6\text{O}_{16}$  and  $\text{BaCr}_2\text{Ti}_6\text{O}_{16}$ , respectively). It is suggested that the nomenclature of the priderite-type

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

minerals be revised so that mannardite becomes Ba-V priderite, redledgeite becomes Ba-Cr priderite, and the mineral from the Mengying kimberlite be known as K-Cr priderite.

**Discussion.** Neither the new name nor the proposed revision in nomenclature has been submitted to the CNMMN for a vote. **J.L.J.**

### Pingguite\*

Zhifu Sun, Keding Luo, Falan Tan, Jingyi Zhang (1994) Pingguite, a new bismuth tellurite mineral. *Acta Mineral. Sinica*, 14(4), 315–321 (in Chinese, English abs.).

The mean and range of 15 electron microprobe analyses gave Bi 71.36 (68.45–72.81), Te 16.13 (14.99–18.70), O 12.24 (12.07–12.55), sum 99.73 (99.69–100.50), corresponding to  $\text{Bi}_{5.80}\text{Te}_{2.15}\text{O}_{13}$ , ideally  $\text{Bi}_6\text{Te}_2\text{O}_{13}$ . Occurs as granular aggregates, to 0.5 mm in diameter, that consist of tabular grains up to 0.6  $\mu\text{m}$  long. Yellowish green color, vitreous to adamantite luster, transparent, brittle,  $VHN_{50} = 449\text{--}572$ ,  $D_{\text{meas}} = 8.44$ ,  $D_{\text{calc}} = 8.64 \text{ g/cm}^3$  for  $Z = 1$ . TGA showed no significant weight loss, and DTA showed a small endothermic peak at about 800 °C. Reflectance percentages (SiC standard, air) are 14.84(470 nm), 13.03(546), 13.25(589), and 13.64(650); biaxial,  $n_{\text{calc}} = 2.145$  at 589 nm. Electron diffraction patterns ( $a$  and  $b$  determined) and refinement from the X-ray diffractometer pattern gave orthorhombic symmetry,  $a = 5.689(1)$ ,  $b = 10.791(1)$ ,  $c = 5.308(1) \text{ \AA}$ ; strongest lines of the powder pattern are 3.146(100,121), 2.841(80,200), 2.694(20,040), 1.956(10,240), 1.695(20,321), and 1.631(10,161), in good agreement with data for the synthetic analog, for which XPS showed  $\text{Te}^{4+}$  and  $\text{Bi}^{3+}$ . A synthetic tetragonal analog is also known.

The mineral occurs in the oxidation zone of a small gold deposit in Pinggu County (hence the new name) near Beijing. Associated minerals are malachite, pyromorphite, bismutite, gold, quartz, scheelite, and iron oxides. Type material is in the Geological Museum of China [Beijing?]. **J.L.J.**

### Triclinic slawsonite

T. Tagai, T. Hoshi, M. Suzuki (1995) A new modification of slawsonite,  $\text{SrAl}_2\text{Si}_2\text{O}_8$ : Its structure and phase transition. *Zeits. Kristallogr.*, 210, 741–745.

Electron microprobe analysis of slawsonite from Sarusaka, Kochi Prefecture, Japan, gave  $\text{SiO}_2$  36.63,  $\text{Al}_2\text{O}_3$  31.30, SrO 29.99, BaO 1.53,  $\text{K}_2\text{O}$  0.06, sum 99.51 wt%, corresponding to  $(\text{Si}_{0.95}\text{Ba}_{0.03})\text{Al}_{2.01}\text{Si}_{2.00}\text{O}_8$ . Single-crystal X-ray structure study ( $R = 0.049$ ) gave triclinic symmetry, space group  $P\bar{1}$ ,  $a = 6.145(1)$ ,  $b = 8.987(2)$ ,  $c = 7.456(3) \text{ \AA}$ ,  $\alpha = 90.01(3)$ ,  $\beta = 90.34(3)$ ,  $\gamma = 89.98(3)^\circ$ ,  $Z = 4$ . Heating experiments showed that the mineral transforms to the monoclinic,  $P2_1/a$  structure previously determined on calcian slawsonite from Wallowa County, Oregon. **J.L.J.**

### Tungstibite\*

K. Walenta (1995) Tungstibite,  $\text{Sb}_2\text{O}_3 \cdot \text{WO}_3$ , a new mineral from the Clara mine near Oberwolfach in the central Black Forest. *Chem. Erde*, 55, 217–224 (in German, English abs.).

The mineral occurs as thin tabular crystals that form globular aggregates to 1 mm in diameter. Electron microprobe analysis gave  $\text{Sb}_2\text{O}_3$  55.5 (range 54.1–56.8),  $\text{WO}_3$  43.6 (42.7–44.1), sum 99.1 wt%, corresponding to  $\text{Sb}_{2.01}\text{W}_{0.99}\text{O}_6$ , ideally  $\text{Sb}_2\text{WO}_6$  or  $\text{Sb}_2\text{O}_3 \cdot \text{WO}_3$ . Crystals are flattened on (001), elongate to 0.5 mm, and some are spear shaped; green color and streak, dull to pearly luster, perfect {001} cleavage, irregular fracture,  $H = 2$ , translucent to opaque, nonfluorescent,  $D_{\text{calc}} = 6.90 \text{ g/cm}^3$  for  $Z = 4$ . Stable on heating to 600 °C; synthesized hydrothermally at 240 °C. Optically biaxial positive,  $\alpha = 2.285$ ,  $\beta = 2.40$ ,  $\gamma = 2.58$ ,  $2V_{\text{calc}} = 82^\circ$ , strong dispersion  $r \ll v$ ; pleochroism  $X$  dark green to brownish green,  $Y$  dark green,  $Z$  pale green to yellowish,  $Z = c$ . Orthorhombic symmetry deduced from the X-ray powder pattern (57 mm camera,  $\text{FeK}\alpha$  radiation, 21 lines listed);  $a = 8.59(2)$ ,  $b = 9.58(2)$ ,  $c = 6.12(2) \text{ \AA}$ , possible space group  $P22_12_1$ ; strongest lines are 3.32(100,211), 3.06(100,002), 2.98(40,130), 2.73(60,310), 2.46(50,122,320), and 1.919(40,322).

The mineral occurs as an oxidation product deposited on quartz, barite, fluorite, tetrahedrite, and chalcopyrite, and some is intergrown with cervantite. The new name alludes to the chemical components, tungsten and antimony. The repository for the type material is not given. **J.L.J.**

### Varennesite\*

J.D. Grice, R.A. Gault (1995) Varennesite, a new species of hydrated Na-Mn silicate with a unique monophyllosilicate structure. *Can. Mineral.*, 33, 1073–1081.

Electron microprobe analyses of three grains gave an average and range of  $\text{Na}_2\text{O}$  19.25 (18.50–19.85), CaO 0.11 (0.06–0.19),  $\text{K}_2\text{O}$  0.21 (0.08–0.31), SrO 0.15 (0.15–0.16), MnO 6.50 (5.45–8.40), FeO 3.25 (2.96–3.71),  $\text{TiO}_2$  2.56 (1.55–3.28), MgO 0.03 (0.00–0.08),  $\text{SiO}_2$  48.26 (47.55–49.22),  $\text{Al}_2\text{O}_3$  0.48 (0.22–0.78),  $\text{SO}_3$  1.02 (0.98–1.07), Cl 2.20 (2.05–2.39),  $\text{H}_2\text{O}$  (calc.) 18.47 (18.37–18.68), O = Cl 0.50, sum 102.00 wt%, corresponding to  $(\text{Na}_{7.64}\text{Ca}_{0.02}\text{K}_{0.06}\text{Sr}_{0.02})_{27.74}(\text{Mn}_{1.13}\text{Fe}_{0.56}\text{Ti}_{0.39}\text{Mg}_{0.01})_{22.09}(\text{Si}_{9.88}\text{Al}_{0.12})_{210.00}\text{O}_{25.35}[\text{Cl}_{0.76}(\text{OH})_{1.24}]_{22.00} \cdot 12\text{H}_2\text{O}$ , ideally  $\text{Na}_8\text{Mn}_2\text{Si}_{10}\text{O}_{25}(\text{OH},\text{Cl})_2 \cdot 12\text{H}_2\text{O}$ . Occurs as pale brownish yellow to orange, tabular crystals to 4 mm length, elongate [001] and showing {100}, {010}, {101}, and {001}. White streak, vitreous luster, translucent to transparent, brittle,  $H = 4$ , good {010} cleavage, conchoidal fracture, nonfluorescent,  $D_{\text{meas}} = 2.31$ ,  $D_{\text{calc}} = 2.32 \text{ g/cm}^3$  for  $Z = 4$ . Optically biaxial positive,  $\alpha = 1.532(2)$ ,  $\beta = 1.540(2)$ ,  $\gamma = 1.550(2)$ ,  $2V_{\text{meas}} = 89(1)$ ,  $2V_{\text{calc}} = 84.1^\circ$ , weak dispersion  $r > v$ ; yellow-green ( $Z$ ) to pale yellow ( $X$ ) pleochroism,  $Z > Y > X$ ; orientation  $X = c$ ,  $Y = a$ ,  $Z = b$ . Single-crystal X-ray structure study ( $R = 0.063$ ) indicated orthorhombic

symmetry, space group  $Cmcm$ ,  $a = 13.461(2)$ ,  $b = 14.981(1)$ ,  $c = 17.506(2)$  Å as refined from a 114 mm Debye-Scherrer pattern (CuK $\alpha$  radiation) with strongest lines of 10.049(100,110), 8.823(50,002), 5.025(20,113), 3.806(20,223), and 2.718(50,423).

The mineral occurs as a late-stage primary phase associated with microcline, albite, aegerine, natrolite, serandite, mangan-neptunite, eudialyte, and zakhstanite in the Cretaceous Saint-Amable alkaline sill, related to Monteregean plutonism, at the Demix-Varennes quarry. The quarry is near the village of Varennes (hence the new name) in Verchères County, approximately 20 km east of Montreal, Quebec. Type material is in the Canadian Museum of Nature, Ottawa, J.L.J.

#### Vlodavetsite\*

L.P. Vergasov, S.K. Filatov, G.L. Starova, G.L. Matusevich, T.M. Filosoza (1995) Vlodavetsite,  $AlCa_2(SO_4)_2F_2Cl \cdot 4H_2O$ , a new mineral from volcanic exhalations. *Doklady Akad. Nauk*, 343(3), 358–360 (in Russian).

G.L. Starova, S.K. Filatov, G.L. Matusevich, V.S. Fundamensky (1995) The crystal structure of vlodavetsite,  $AlCa_2(SO_4)_2F_2Cl \cdot 4H_2O$ . *Mineral. Mag.*, 59, 159–162.

Electron microprobe analyses of 11 microcrystals gave a mean and range of  $Al_2O_3$  12.37 (11.21–13.41),  $CaO$  25.11 (23.07–26.55),  $SO_3$  35.97 (32.15–38.08),  $Cl$  4.59 (3.50–6.00),  $O \equiv Cl$  1.03 (0.79–1.35), sum 77.01 (75.01–80.73) wt%; an analysis of the water-soluble fraction, containing some volcanogenic impurities, gave  $Cl$  6.08 and  $F$  8.1 wt%. The ratio  $Cl:F:H_2O = 1:2:4$  was established by the crystal-structure determination; the empirical formula is  $Al_{1.09}Ca_{2.00}(SO_4)_{2.01}F_{1.94}Cl_{0.77} \cdot 4H_2O$ . The mineral occurs as plastic (resembling wet clay) yellowish coatings consisting mainly of flakes, tablets, and plates, about 0.1–0.3 mm. Square plates show {100} and {001}. Colorless, transparent, vitreous luster, perfect {100} cleavage,  $D_{calc} = 2.10$  and  $2.35$  g/cm<sup>3</sup> for the empirical and ideal formulas, respectively, and  $Z = 2$ . Readily soluble in acids. Optically uniaxial positive,  $\epsilon = 1.526(3)$ ,  $\omega = 1.509(2)$ . Single-crystal X-ray structure study ( $R = 0.046$ ) indicated tetragonal symmetry, space group  $I4/m$ ,  $a = 6.870(1)$ ,  $c = 13.342(2)$  Å. The powder pattern (21 lines given) has strongest lines at 6.67(60,002), 3.92(50,112), 3.73(40,103), 3.431(100,200), and 3.335(80,004).

The mineral occurs on the walls of open fractures, at a depth of >1 m and at ~100 °C, in the second cone of the Northern Breakthrough of the Main Tolbachik Fracture Eruption (1975–1976) at Kamchatka, Russia. The coatings also contain gypsum, sellaite, hydrophilite, bischofite, various chlorides, and fragments of altered volcanoclastics. The new name is for volcanologist V.I. Vlodavets (1893–1993). Type material is in the Mining Museum of the Saint Petersburg Mining Institute, Russia. N.N.P.

#### PtRuRh<sub>0.5</sub>, Rh<sub>5</sub>S<sub>4</sub>

T. Augé, P. Maurizot (1995) Stratiform and alluvial platinum mineralization in the New Caledonia ophiolite complex. *Can. Mineral.*, 33, 1023–1045.

#### PtRuRh<sub>0.5</sub>

The mineral occurs in several grains of isoferroplatinum from chromitiferous beach sand collected at the estuary of the Ni River, New Caledonia. Electron microprobe analyses of two grains gave Os 2.15, 2.22, Ru 25.96, 25.52, Pt 54.16, 54.28, Cr 0.10, 0.05, Ir 2.93, 3.11, S 0.01, 0.00, Fe 1.19, 0.76, Rh 13.68, 14.00, Cu 0.10, 0.18, Ni 0.04, 0.12, sum 100.31, 100.23 wt%; the general formula is  $Pt_{0.36-0.44}Ru_{0.26-0.37}Rh_{0.08-0.21}Fe_{0.02-0.1}Ir_{0.01-0.07}Os_{0.01-0.04}$ , simplified as  $PtRuRh_{0.5}$ . Occurs among the interstices of rounded grains of Pt<sub>3</sub>Fe, possibly suggesting high-temperature exsolution; also as droplets, 2–3 µm across, and as larger grains enclosed in a host of isoferroplatinum.

#### Rh<sub>5</sub>S<sub>4</sub>

The mineral occurs in isoferroplatinum containing bowieite and inclusions of laurite. Two electron microprobe analyses of a grain, about 20 µm across, gave Pt 4.27–4.28, Cr 0.07–0.12, As 0.06–0.11, Ir 1.36–1.36, Pd 0.23–0.63, Co 0.06–0.10, S 19.97–20.03, Fe 0.93–1.16, Rh 70.42–71.02, Cu 0.92–1.06, Ni 0.84–0.91, sum 99.65–100.26 wt%, corresponding to  $(Rh_{4.44}Pt_{0.14}Fe_{0.13}Cu_{0.11}Ni_{0.09}Ir_{0.05}Pd_{0.01})_{24.97}S_{4.02}$ , ideally  $Rh_5S_4$ . The mineral possibly is the S analog of luberoite Pt<sub>5</sub>Se<sub>4</sub>. Occurs in alluvium at the estuary of the Ni river.

**Discussion.** Me:S of the  $Rh_5S_4$  mineral is close to those of the  $Me_{1-x}S$  minerals from Russia, abstracted in *Am. Mineral.*, 80, p. 1330 (1995). J.L.J.

#### (Fe,Ru)S<sub>2</sub>

A.Yu. Barkov, Ye.E. Savchenko, A.A. Zhangurov (1995) Fluid migration and its role in the formation of platinum-group minerals: Evidence from the Imandrovsky and Lukkulaivaara layered intrusions, Russia. *Mineral. Petrology*, 54, 249–260.

Electron microprobe analysis of a grain, about 10 × 15 µm, gave Ru 10.1, Rh 0.4, Os 0.7, Ir 0.4, Fe 37.5, Ni 0.2, S 48.7, sum 98.0 wt%, corresponding to  $(Fe_{0.87}Ru_{0.13})S_{1.98}$ . Occurs in a hydrosilicate host in the Imandrovsky intrusion, Kola Peninsula, Russia. May be a PGE-rich variety of pyrite. J.L.J.

#### AuO(OH,Cl)·nH<sub>2</sub>O

M.I. Novgorodova, M.E. Generalov, N.V. Trubkin (1995) New gold in weathering crusts of the southern Urals. *Geol. Ore Deposits*, 37(1), 32–43.

Weathering of primary gold mineralization associated

with quartz veins and stringers has led to economic gold concentrations in the residual, untransported crust. In addition to residual native gold (10–30% of total Au), secondary Au occurs in dispersed, polymineral intergrowths in which the Au is present as native gold and as a hydroxide. The latter in reflected light is violet or purple, isotropic. Reflectance percentages (given in 20 nm steps) are 18.3(420), 15.6(460), 13.5(500), 14.5(540), 21.58(580), 16.7(620), 17.7(660), and 18.8(700); the increase at the higher wavelengths is attributed to submicrometer inclusions of metallic Au. Electron microprobe analyses of three grains of the hydroxide gave Au 67.06, Au 61.72, and Au 67.57, Ag 5.53, Si 2.14 wt%; O is generally ~25%, and Cl is insignificant. The analytical results are not attributed to a monomineral phase because admixed native gold is always present. Electron diffraction study indicated cubic symmetry, space group  $Fm\bar{3}m$ ,  $a = 4.95 \text{ \AA}$ ; the strongest diffraction spots are 2.47(002), 2.02(211), 1.75(220), and 1.43(222). Individual grains are round and  $<0.1 \mu\text{m}$  in size. IR spectra of particles of native gold containing rims of the violet-purple phase showed absorption bands at 3480, 3390, 1030, 580–620, and  $530 \text{ cm}^{-1}$ . The absorption bands in the area  $580\text{--}620 \text{ cm}^{-1}$  are characteristic of gold hydroxide, and it is suggested that the data indicate that the compound is of the type  $\text{AuO}(\text{OH}, \text{Cl}) \cdot n\text{H}_2\text{O}$ .

The mineral occurs in an area about 125 km northeast of Orsk in the southern Urals (at approx. long.  $60^\circ$ , lat.  $52^\circ$ ). The polymineral Au-bearing intergrowths also contain feroxyhyte, lepidocrocite, hematite, magnetite, and tellurates of Fe and Bi; deposition of the intergrowths was preceded by the crystallization of goethite. **J.L.J.**

#### $\text{K}(\text{Ti}_5\text{Fe}_3\text{Ca}_2\text{Mg}_2)_{212}\text{O}_{19}$ , $\text{Ba}(\text{Ti}_5\text{Fe}_4\text{Mg}_2\text{Cr})_{212}\text{O}_{19}$

Qui Lu, Huyun Chou (1994) Newly discovered members of the yimengite isomorphous series:  $\text{K}(\text{Ti}_5\text{Fe}_3\text{Ca}_2\text{Mg}_2)_{212}\text{O}_{19}$  and  $\text{Ba}(\text{Ti}_5\text{Fe}_4\text{Mg}_2\text{Cr})_{212}\text{O}_{19}$ . *Acta Mineral. Sinica*, 14(3), 228–233 (in Chinese, English abs.).

The minerals occur in the Mongyin kimberlite, Shandong Province, China, in magnesian ilmenite containing crystallographically oriented exsolution lamellae of spinel. For the K- and Ti-containing mineral, six electron microprobe analyses (cited to three decimal places) gave a range of  $\text{SiO}_2$  0.000–0.245,  $\text{Al}_2\text{O}_3$  0.804–1.198,  $\text{TiO}_2$  38.181–45.442,  $\text{FeO}$  20.710–24.900,  $\text{Cr}_2\text{O}_3$  15.373–20.483,  $\text{MgO}$  6.036–7.864,  $\text{K}_2\text{O}$  3.160–4.204,  $\text{Na}_2\text{O}$  0.329–0.648,  $\text{CaO}$  0.053–0.411,  $\text{BaO}$  0.000–1.251,  $\text{ZrO}_2$  0.145–0.561,  $\text{SrO}$  0.055–0.377,  $\text{MnO}$  0.001–0.457,  $\text{V}_2\text{O}_5$  0.166–1.245,  $\text{Nb}_2\text{O}_5$  0.024–0.582,  $\text{La}_2\text{O}_3$  0.000–0.473,  $\text{Ce}_2\text{O}_3$  0.000–0.021,  $\text{Ta}_2\text{O}_5$  0.000–0.975, sum 98.046–100.455 wt%, with the average corresponding to  $(\text{K}_{0.741}\text{Na}_{0.155}\text{Ca}_{0.028}\text{Ba}_{0.025}\text{Sr}_{0.012}\text{La}_{0.007})_{20.943}(\text{Ti}_{4.915}\text{Fe}_{3.206}\text{Cr}_{2.137}\text{Mg}_{1.506}\text{Al}_{0.186}\text{V}_{0.144}\text{Zr}_{0.029}\text{Nb}_{0.022}\text{Ta}_{0.019}\text{Mn}_{0.016}\text{Sr}_{0.008})_{212.058}\text{O}_{19}$ . The simplified formula is  $\text{K}(\text{Ti}_5\text{Fe}_3\text{Cr}_2\text{Mg}_2)_{212}\text{O}_{19}$ , which is the Ti analog of yimengite,  $\text{K}(\text{Cr}_5\text{Ti}_3\text{Fe}_2\text{Mg}_2)_{212}\text{O}_{19}$ .

Four electron microprobe analyses of the Ba- and Ti-

containing mineral gave  $\text{SiO}_2$  0.000–0.348,  $\text{Al}_2\text{O}_3$  0.391–0.941,  $\text{TiO}_2$  36.644–41.529,  $\text{FeO}$  28.025–30.753,  $\text{Cr}_2\text{O}_3$  7.982–12.883,  $\text{MgO}$  5.431–6.706,  $\text{K}_2\text{O}$  1.804–2.524,  $\text{Na}_2\text{O}$  0.110–0.434,  $\text{CaO}$  0.200–1.027,  $\text{BaO}$  6.613–7.006,  $\text{ZrO}_2$  0.217–0.537,  $\text{SrO}$  0.211–0.539,  $\text{MnO}$  0.118–0.260,  $\text{V}_2\text{O}_5$  0.925–1.104,  $\text{Nb}_2\text{O}_5$  0.000–0.447,  $\text{La}_2\text{O}_3$  0.038–0.476,  $\text{Ta}_2\text{O}_5$  0.000–1.298, sum 97.364–100.200 wt%. The average corresponds to  $(\text{Ba}_{0.506}\text{K}_{0.415}\text{Ca}_{0.109}\text{Na}_{0.106}\text{La}_{0.019}\text{Sr}_{0.018})_{21.235}(\text{Ti}_{4.928}\text{Fe}_{4.050}\text{Mg}_{1.442}\text{Cr}_{1.291}\text{Al}_{0.106}\text{V}_{0.129}\text{Zr}_{0.032}\text{Mn}_{0.026}\text{Nb}_{0.016}\text{Ta}_{0.013}\text{Zr}_{0.017})_{212.050}\text{O}_{19}$ , simplified as  $(\text{Ba}, \text{K})(\text{Ti}_5\text{Fe}_4\text{Mg}_2\text{Cr})_{212}\text{O}_{19}$ , which is the Ti analog of hawthornite,  $\text{Ba}(\text{Cr}_4\text{Fe}_4\text{Ti}_3\text{Mg})_{212}\text{O}_{19}$ . The minerals, which belong to the magnetoplumbite group, occur as subhedral to euhedral tabular microcrystals to  $4 \times 12 \mu\text{m}$ ; aggregates exhibit a dendritic morphology and cut across and segment the host ilmenite. **J.L.J.**

#### $\text{Th}_6\text{B}_8\text{Si}_7\text{O}_{38}$

I.Ya. Nekrasov, R.A. Nekrasova (1995) A new thorium borosilicate from the Tommot deposit. *Doklady Akad. Nauk*, 342(3), 361–364 (in Russian).

Chemical analysis of a sample containing admixed aegirine and apatite, after adjustment on the basis of electron microprobe results, gave  $\text{SiO}_2$  12.97,  $\text{TiO}_2$  1.31,  $\text{CaO}$  0.82,  $\text{ThO}_2$  63.71, REE 0.24,  $\text{B}_2\text{O}_3$  10.77,  $\text{H}_2\text{O}^+$  0.23, admixed impurities 10.41, sum 100.46 wt%, from which the empirically derived formula is  $\text{Th}_6\text{B}_8\text{Si}_7\text{O}_{38}$ . Occurs as dark brown grains to 2 mm and in nodular aggregates to 15 mm across. Light brown streak, vitreous to greasy luster, brittle,  $H_{100} = 578 \text{ kg/mm}^2$  (mean of 15),  $D_{\text{meas}} = 4.12 \text{ g/cm}^3$ . DTA showed endothermic effects at  $165^\circ\text{C}$  (weak) and  $880^\circ\text{C}$ . X-ray amorphous; on heating to  $1000^\circ\text{C}$ , forms a mixture of thorianite,  $\text{ThSiO}_4$ , and a thorium borate isostructural with  $\text{PbB}_2\text{O}_4$ .

The mineral is associated with zircon, titanite, apatite, ilmenite, chevkinite, and is extensively replaced by britholite, in the Tommot deposit, which is in the basin of the Indigirka River in the Republic of Sakha-Yakutiya, Russian Federation. The mineral occurs within boudins of garnet-biotite schists with pegmatite cores; these were metasomatized and formed an innermost zone of britholite  $\pm$  quartz, an intermediate zone of albite and the thorium borosilicate, and an outer zone in which aegirine was added. Type specimens of the thorium borosilicate are in the Fersman Mineralogical Museum, Moscow, Russia. **N.N.P.**

#### New Data

##### Biotite-5M

H. Xu, D.R. Veblen (1995) Periodic and nonperiodic stacking in biotite from the Bingham Canyon porphyry

copper deposit, Utah. *Clays Clay Minerals*, 43(2), 159–173.

Biotite platelets within primary actinolite in quartz monzonite at the Bingham Canyon deposit consist mainly of the  $1M$  and  $1M_a$  polytypes. SAED and HRTEM determinations showed that the new  $5M_1$  polytype with  $c = \sim 50 \text{ \AA}$  is also present, and its composition approximates  $(K_{0.72} Ca_{0.02})_{20.74} (Mg_{1.80} Fe_{0.92} Ti_{0.22})_{22.94} [(Si_{2.88} Al_{1.08} Ti_{0.04})_{24.00} O_{10}](OH)_2$ . **J.L.J.**

#### Geminite

M.A. Cooper, F.C. Hawthorne (1995) The crystal structure of geminite,  $Cu^{2+}(AsO_3OH)(H_2O)$ , a heteropolyhedral sheet structure. *Can. Mineral.*, 33, 1111–1118.

Single-crystal X-ray structure study ( $R = 0.03$ ) of type geminite from Cap Garonne, France, gave triclinic symmetry,  $a = 9.841(2)$ ,  $b = 10.818(2)$ ,  $c = 15.733(3) \text{ \AA}$ ,  $\alpha = 95.71(2)$ ,  $\beta = 90.94(2)$ ,  $\gamma = 103.11(2)^\circ$ , space group  $C\bar{1}$ ,  $Z = 16$ . The unit cell is new. **J.L.J.**

#### Giannettite

R.K. Rastsvetaeva, D.Yu. Pushcharovskii, D. Atencio (1995) Crystal structure of giannettite. *Kristallografiya*, 40(4), 626–630 (in Russian).

Single-crystal X-ray structure study ( $R = 0.066$ ) of the previously poorly defined mineral giannettite, from the type locality at Minas Gerais, Brazil, showed it to be triclinic,  $a = 9.584(2)$ ,  $b = 7.267(2)$ ,  $c = 5.708(1) \text{ \AA}$ ,  $\alpha = 89.52(2)$ ,  $\beta = 101.22(2)$ ,  $\gamma = 101.03(1)^\circ$ , space group  $P1$ ,  $Z = 1$ . The structural formula is  $Na_2Ca[Ti(O,OH)_2(Si_2O_7)_2] \cdot Ca_3(Ca_{0.7}Mn_{0.1}Fe_{0.1}Ce_{0.1}) \cdot F_2$ . Ordering of Na and Ca, and partitioning of non-Ca atoms, into specific sites distinguish giannettite from rinkite and götz-enite.

**Discussion.** Requires clarification with respect to hainite; the previous discussion pertaining to hainite (*Am. Mineral.*, 75, p. 936, 1990) is still valid. **J.L.J.**

#### Guilleminite

M.A. Cooper, F.C. Hawthorne (1995) The crystal structure of guilleminite, a hydrated Ba-U-Se sheet structure. *Can. Mineral.*, 33, 1103–1109.

Single-crystal X-ray structure study ( $R = 0.047$ ) of guilleminite from the type locality confirmed the orthorhombic symmetry and cell dimensions and established the space group as  $P2_1nm$ . The structure determination showed the composition to be  $Ba(UO_2)_3(SeO_3)_2O_2(H_2O)_3$ . The formula is new. **J.L.J.**

#### Zippeite

R. Vochten, L. van Haverbeke, K. van Springel, N. Blaton, O.M. Peeters (1995) The structure and physico-chemical characteristics of synthetic zippeite. *Can. Mineral.*, 33, 1091–1101.

Synthetic zippeite, which gives an X-ray powder pattern identical to those from natural specimens, has the composition  $K(UO_2)_2SO_4(OH)_3 \cdot H_2O$ . Single-crystal X-ray structure study ( $R = 0.053$ ) showed the mineral to be monoclinic, space group  $C2/c$ ,  $a = 8.755(3)$ ,  $b = 13.987(7)$ ,  $c = 17.730(7) \text{ \AA}$ ,  $\beta = 104.13(3)^\circ$ ,  $D_{meas} = 4.8$ ,  $D_{calc} = 4.696 \text{ g/cm}^3$  for  $Z = 8$ . The formula, symmetry, and cell are new. **J.L.J.**

#### $(K,NH_4)MgCl_3 \cdot 6H_2O$

H.-J. Herbert, W. Sander, H. Blanke, S. Baitz, H. Jacobi, H. Follner (1995) A new anthropogenic  $(K,NH_4)MgCl_3 \cdot 6H_2O$  phase at the location "Bunte First" in the repository for radioactive wastes in Morsleben, Germany. *Neues Jahrb. Mineral. Mon.*, 351–358.

The phase previously abstracted as  $K_2(NH_4)Mg_3Cl_9 \cdot 18H_2O$  (*Am. Mineral.*, 79, p. 1213, 1994) has the composition  $K_{0.64}(NH_4)_{0.36}MgCl_3 \cdot 6H_2O$  and is monoclinic,  $a = 6.66(2)$ ,  $b = 6.68(1)$ ,  $c = 13.22(4) \text{ \AA}$ ,  $\beta = \sim 90^\circ$ . The high ammonium levels required for the formation of the compound were derived by the release of ammonia from the excrement of chickens that were raised in the underground workings. **J.L.J.**