

## New Mineral Names\*

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### IN THIS ISSUE

This New Mineral Names has entries for 10 new minerals, including aluminocoquimbite, bariopharmacoalumite, iangreyite, nordgauite, plumboselite, rakovanite, as well as three unnamed validated minerals. These new minerals come from several different sources including *Can. Mineral.*, *Mineralogical Magazine*, *Mineralogy and Petrology*, *Dokl. Chem.*, and *American Mineralogist*.

### ALUMINOCOQUIMBITE

F. Demartin, C. Castellano, C.M. Gramaccioli, and I. Camprostrini (2010) Aluminocoquimbite,  $\text{AlFe}(\text{SO}_4)_3 \cdot 9\text{H}_2\text{O}$ , a new aluminum iron sulfate from Gortta Dell' Allume, Vulcano, Aeolian Islands, Italy. *Can. Mineral.*, 48, 1465–1468.

Aluminocoquimbite, ideally  $\text{AlFe}(\text{SO}_4)_3 \cdot 9\text{H}_2\text{O}$ , is a low-temperature (<100 °C) fumarolic product from Grotta dell' Allume in the Aeolian Islands (Vulcano), Italy, where it occurs as colorless/pale pink tabular or prismatic crystals (up to 0.5 mm) with alunogen, coquimbite, krausite, tamarugite, voltaite, pickeringite, and metavoltine. Chemical, spectroscopic, and crystallographic data are reported. The mineral is non-fluorescent, has a white streak and vitreous luster. It is uniaxial positive ( $\omega = 1.53$ ,  $\epsilon = 1.56$  at 589 nm).

The empirical formula determined by EDS (O = 21) and with H<sub>2</sub>O calculated by difference, due to scarcity of material is:  $\text{Al}_{1.07}\text{Fe}_{0.92}\text{S}_{2.92}\text{H}_{18.49}\text{O}_{21}$ , leading to the simplified formula  $\text{AlFe}(\text{SO}_4)_3 \cdot 9\text{H}_2\text{O}$ . The infrared spectrum has absorption bands due to SO<sub>4</sub> stretching modes (943, 1034, 1096, 1149 cm<sup>-1</sup>) and H<sub>2</sub>O stretching modes (3040, 3388, 3675 cm<sup>-1</sup>).

The crystal structure was determined by single-crystal X-ray diffraction to final agreement indices of  $R_1 = 0.0218$  and  $wR_2 = 0.0685$ . Aluminocoquimbite is trigonal, space group  $P\bar{3}1c$ ,  $a = 10.7065(7)$ ,  $c = 17.3077 \text{ \AA}$ ,  $V = 1718.2(2) \text{ \AA}^3$  ( $Z = 4$ ). Unit-cell parameters refined from X-ray powder diffraction data are  $a = 10.7078(7)$ ,  $c = 17.3033 \text{ \AA}$ ,  $V = 1718.1(2) \text{ \AA}^3$ . The strongest lines [ $d_{\text{obs}}$  in  $\text{Å}$  ( $I_{\text{obs}}$  %,  $hkl$ )] are: 9.251 (100, 010), 5.310 (83, 110), 3.152 (43,  $\bar{2}24$ ), 4.087 (33, 022), 1.765 (20,  $\bar{5}53$ ), and 2.112 (17,  $\bar{2}51$ ). The structure consists of two non-equivalent Fe<sup>2+</sup> octahedra linked only to SO<sub>4</sub> groups, isolated Al(H<sub>2</sub>O)<sub>6</sub> octahedra and interstitial H<sub>2</sub>O molecules. The Fe octahedra, decorated with SO<sub>4</sub> tetrahedra, form infinite chains extending along [001]. Hydrogen-bonding links these columns with isolated Al(H<sub>2</sub>O)<sub>6</sub> octahedra at 0 and ½ to form large cages in which six molecular

H<sub>2</sub>O groups occur in a cyclohexane-like chain configuration. Aluminocoquimbite differs structurally from coquimbite in having continuous infinite chains of alternating Fe(1) and Fe(2) octahedra that are involved in corner-sharing with six SO<sub>4</sub> groups providing the bridges between Fe octahedra. Coquimbite the “chains” does not have infinite chains, but short triplets of Fe octahedra extending along [001] in which the central octahedron shares corners with six SO<sub>4</sub> groups. The two terminal octahedra are connected to three SO<sub>4</sub> tetrahedra and their remaining oxygen atoms are in H<sub>2</sub>O groups. **M.W.**

### BARIOPHARMACOALUMITE

S.J. Mills, M.S. Rumsey, G. Favreau, J. Spratt, M. Raudsepp, and M. Dini (2011) Bariopharmacoalumite, a new mineral species from Cap Garonne, France, and Mina Grande, Chile. *Mineralogical Magazine*, 75, 135–144.

Bariopharmacoalumite (IMA 2010-041) from the copper mine of Cap Garonne, near the town of Le Pradet, Var, France, ideally  $\text{Ba}_{0.5}\text{Al}_4(\text{AsO}_4)_3(\text{OH})_4 \cdot 4\text{H}_2\text{O}$ , is a new mineral belonging to the pharmacosiderite supergroup. The country rock consists of conglomerates and sandstones of Triassic age, and the minerals present are mainly secondary species derived from the breakdown of tetrahedrite/tennantite and galena. Bariopharmacoalumite occurs as colorless to pale yellow interpenetrating cubes up to 0.5 mm across, associated with mansfieldite, philipsbornite, beudantite, carminite, duftite, mimetite, scorodite, olivenite, arsentsumebite, and lavendulan. Crystals of bariopharmacoalumite are transparent to translucent, with a white streak, adamantine luster, and imperfect cleavage on {001}. The tenacity is brittle, the fracture irregular, and the mineral is non-fluorescent. The Vickers hardness is 234, equivalent to a Mohs hardness of 3.5. Bariopharmacoalumite is isotropic, with  $n = 1.573$  [upper estimate, calculated from reflectance values at 589 nm using Fresnel Equations]. Crystals show anomalous extinction (typical of members of the supergroup) as well as deep blue internal reflections that are probably due to twinning. The calculated density is 2.580 g/cm<sup>3</sup>. The empirical formula for bariopharmacoalumite (based on microprobe analysis: Cameca SX-100, WDS-mode),

\*All minerals marked with an asterisk have been approved by the IMA CNMMC. E-mail: ktait@rom.on.ca

calculated on the basis of 20 oxygen atoms per formula unit, is:  $(\text{Ba}_{0.54}\text{Cu}_{0.03}\text{K}_{0.01})_{\Sigma 0.58}(\text{Al}_{3.99}\text{Fe}_{0.02})_{\Sigma 4.01}(\text{AsO}_4)_{3.00}(\text{OH})_{3.85}\text{O}_{0.15}\cdot 4\text{H}_2\text{O}$ . The four strongest lines in the X-ray powder pattern are [ $d$  in Å ( $I_{\text{obs}}$  %,  $hkl$ ): 7.759(100,001), 5.485(27,011), 3.878(27,002), 4.454(18,111)]. Bariopharmacoalumite is cubic, space group  $P\bar{4}3m$  with  $a = 7.742(4)$  Å,  $V = 464.2(4)$  Å<sup>3</sup>, and  $Z = 1$ . The crystal structure was solved by direct methods, single-crystal X-ray diffraction data, and refined to  $R_1 = 0.0705$  for 215 reflections with  $I > 4\sigma(I)$  and is consistent with other members of the pharmacosiderite supergroup. The holotype is preserved in the collections of the Natural History Museum, London, under the registration number BM 2010,82. **G.D.G and F.C.**

### IANGREYITE

S.J. Mills, A.R. Kampf, J. Sejkora, P.M. Adams, W.D. Birch, and J. Plášil (2011) Iangreyite: a new secondary phosphate mineral closely related to perhamite. *Mineralogical Magazine*, 75, 327–336.

Iangreyite (IMA 2009-087), ideally  $\text{Ca}_2\text{Al}_7(\text{PO}_4)_2(\text{PO}_3\text{OH})_2(\text{OH},\text{F})_{15}\cdot 8\text{H}_2\text{O}$ , is a new mineral species from the Silver Coin mine, Nevada, U.S.A., and the Krásno ore district, Horní Slavkov, Czech Republic. The host rocks of iangreyite at Silver Coin are thin-bedded quartzite, argillite, and phosphatic argillite of late Palaeozoic age, in which iangreyite occurs as thin, colorless to white or cream, hexagonal tablets (up to 0.4 mm in diameter and 0.02 mm thick), associated with meurigite-Na, plumbogummitite, kidwellite, lipscombite, strengite, chalcosiderite, wardite, leucophosphite, wavellite, goethite, barite, quartz, and F-rich perhamite. The Krásno ore district is represented by greisen mineralization in several granite cupolas of the large Krušné hory (Erzgebirge) granite batholiths, underlying metamorphic rock (mainly gneisses). At Krásno, iangreyite is found in white, yellowish, or light pink intergrown tabular crystals, with a maximum diameter of 0.2 mm. Individual crystals of iangreyite are transparent with a vitreous luster, while clusters tend to be pearly and translucent. Crystals of iangreyite show an irregular fracture, with a perfect cleavage on {001}. The estimated Mohs hardness is 7. Iangreyite does not fluoresce under  $lw$ - or  $sw$ -ultraviolet light. The calculated density is 2.451 g/cm<sup>3</sup>, while the measured (by the sink-float method in an aqueous solution of sodium polytungstate) is 2.46(3) g/cm<sup>3</sup>. The mineral is uniaxial positive with  $\omega = 1.544(2)$  and  $\epsilon = 1.554(2)$  measured in white light, and non-pleochroic. Its empirical formula (based on microprobe analysis: Cameca SX-100, WDS-mode), calculated on the basis of 39 anions per formula unit, is:  $\text{Ca}_{1.42}\text{K}_{0.22}\text{Na}_{0.09}\text{Ba}_{0.03}\text{Sr}_{0.01}\text{Al}_{6.51}\text{Mg}_{0.09}\text{Fe}_{0.02}\text{Cu}_{0.01}\text{Zn}_{0.01}\text{P}_{3.81}\text{F}_{5.24}\text{H}_{30.21}\text{O}_{33.76}$  from the Silver Coin mine, and  $\text{Ca}_{2.15}\text{K}_{0.10}\text{Na}_{0.01}\text{Ba}_{0.02}\text{Sr}_{0.12}\text{Al}_{6.28}\text{Mg}_{0.01}\text{Fe}_{0.12}\text{Cu}_{0.08}\text{Zn}_{0.01}\text{P}_{3.64}\text{Si}_{0.43}\text{F}_{4.65}\text{H}_{29.62}\text{O}_{34.35}$  from Krásno. The observed five strongest powder X-ray diffraction lines (Silver Coin iangreyite) are [ $d$  in Å ( $I_{\text{obs}}$  %,  $hkl$ ): 16.734 (100, 001), 2.967 (45, 021), 2.219 (19, 017), 6.054 (18, 010) and 1.744 (17, 220)]. Iangreyite is trigonal, space group  $P321$  and  $Z = 1$ , with the unit-cell parameters (Silver Coin):  $a = 6.988(1)$ ,  $c = 16.707(3)$  Å, and  $V = 706.5(2)$  Å<sup>3</sup> and (Krásno):  $a = 6.989(1)$ ,  $c = 16.782(4)$  Å and  $V = 709.8(2)$  Å<sup>3</sup>. The structure was refined by the Rietveld method. It consists of pairs of crandallite-like composite layers of corner-connected Al-centered octahedra and P-centered

tetrahedra, with Ca atoms located between the layers, as in crandallite. The apical oxygen atoms of the  $\text{PO}_4$  tetrahedra are corner-connected to  $\text{AlO}_2(\text{OH})_3$  trigonal bipyramids to complete the polyhedral framework, with large 10-membered ring channels along [110], which contain Ca and  $\text{H}_2\text{O}$  molecules. Because no single specimen provided all of the data for the description, there is no specimen that qualifies as the holotype. However, two cotype specimens from the Silver Coin mine are housed in the collections of Mineral Sciences Department, Natural History Museum of Los Angeles County, catalogue numbers 57661 and 62519, and one from Krásno in the collections of the Department of Mineralogy and Petrology, National Museum Prague, catalogue number P1P 20/2009. **G.D.G and F.C.**

### NORDGAUITE

W.D. Birch, I.E. Grey, S.J. Mills, A. Pring, C. Bougerol, A. Ribaldi-Tunnicliffe, N.C. Wilson, and E. Keck (2011) Nordgauite,  $\text{MnAl}_2(\text{PO}_4)_2(\text{F},\text{OH})_2\cdot 5\text{H}_2\text{O}$ , a new mineral from the Hagendorf-Süd pegmatite, Bavaria, Germany: description and crystal structure. *Mineralogical Magazine*, 75(2), 269–278.

Nordgauite (IMA 2010-040), ideally  $\text{MnAl}_2(\text{PO}_4)_2(\text{F},\text{OH})_2\cdot 5\text{H}_2\text{O}$ , is a new secondary phosphate from the Hagendorf-Süd pegmatite, Bavaria, Germany. Nordgauite occurs associated with fluorapatite, sphalerite, uraninite, a columbite-tantalite phase, metastrengite, several unnamed members of the whiteite-jahnsite family, and a new analogue of kingsmountite. The mineral is named for Nordgau, the oldest name for that part of northeastern Bavaria in which Hagendorf is situated, and where mining has taken place since the 13<sup>th</sup> century. Electron microprobe analysis (Cameca SX50) yielded: CaO 0.96, MgO 0.12, MnO 14.29, FeO 0.60, ZnO 0.24,  $\text{Al}_2\text{O}_3$  22.84,  $\text{P}_2\text{O}_5$  31.62, F 5.13, and  $\text{H}_2\text{O}$  22.86 (by CHN), less F=O 2.16, total 96.50 (wt%), corresponding, on the basis of 2 P atoms per formula unit, to:  $(\text{Mn}_{0.90}\text{Ca}_{0.08}\text{Fe}_{0.04}\text{Zn}_{0.01}\text{Mg}_{0.01})_{\Sigma 1.04}\text{Al}_{2.01}(\text{PO}_4)_2[\text{F}_{1.21}(\text{OH})_{0.90}]_{\Sigma 2.11}\cdot 5.25\text{H}_2\text{O}$ . Nordgauite occurs as white to off-white compact, waxy nodules and soft fibrous aggregates a few millimeters across in altered zwieselite-triplite. Individual crystals are tabular to prismatic, up to 200 µm long and 10 µm wide. Properties such as cleavage, fracture, twinning, and parting could not be determined by the authors. The streak is white.  $D_{\text{meas}}$  (sink/float method in sodium polytungstate solution with water) = 2.35 g/cm<sup>3</sup>,  $D_{\text{calc}} = 2.46$  g/cm<sup>3</sup>. Optically, nordgauite is biaxial with an average RI of  $n = 1.57$ . No other optical properties were determined due to its mode of occurrence. The seven strongest X-ray powder diffraction lines of nordgauite are [ $d$  in Å ( $I_{\text{obs}}$  %,  $hkl$ ): 9.806 (100, 010), 7.432 (40,  $1\bar{1}0$ ), 4.119 (20, 210), 2.951 (16,  $0\bar{3}1$ ), 4.596 (12,  $2\bar{1}0$ ), 3.225 (12, 220) and 3.215 (12, 121)]. Cell parameter refinement yielded a triclinic lattice with  $a = 9.920(4)$ ,  $b = 9.933(3)$ ,  $c = 6.087(2)$  Å,  $\alpha = 92.19(3)$ ,  $\beta = 100.04(3)$ ,  $\gamma = 97.61(3)^\circ$ ,  $V = 584.2(9)$  Å<sup>3</sup>. The crystal structure was solved by direct methods (SIR-92) using synchrotron light (MX2 beam line, Australian Synchrotron;  $\lambda = 0.71086$  Å) diffraction data collected at 100 K on a  $60 \times 3 \times 4$  µm needle, and refined in the space group  $P\bar{1}$  to  $R_1 = 0.0427$ . The single-crystal cell parameters are  $a = 9.887(2)$ ,  $b = 9.796(2)$ ,  $c = 6.054(2)$  Å,  $\alpha = 92.70(1)^\circ$ ,  $\beta = 99.83(1)^\circ$ ,  $\gamma = 97.10(1)^\circ$ ,  $V = 571.9(3)$  Å<sup>3</sup> (Z

= 2). Although nordgauite shows stoichiometric similarities to mangangordonite and kastningite, its structure is more closely related to those of vauxite and montgomeryite in that it contains zigzag strings of corner-connected Al-terminated octahedra along [011], where the shared corners are alternately in *cis* and *trans* configuration. These chains link through corner-sharing with PO<sub>4</sub> tetrahedra along [001] to form (100) slabs that are interconnected via edge-shared dimers of MnO<sub>6</sub> polyhedra and other PO<sub>4</sub> tetrahedra. There is no single type specimen. Co-types are housed in the collections of Museum Victoria, Melbourne, Australia, registered numbers M48795 and M51231. **F.C. and G.D.G.**

### PLUMBOSELITE

A.R. Kampf, S.J. Mills, and W.W. Pinch (2011) Plumboselite, Pb<sub>3</sub>O<sub>2</sub>(SeO<sub>3</sub>), a new oxidation-zone mineral from Tsumeb, Namibia. *Mineralogy and Petrology*, 101, 75–80.

Plumboselite (IMA 2010-028), ideally Pb<sub>3</sub>O<sub>2</sub>(SeO<sub>3</sub>), is a new selenite from the Tsumeb mine, Namibia. It is known to occur on only three specimens collected by late John Innes and no information appears to have survived regarding the specific location. The authors assume it comes from the second oxidation zone, on or in the vicinity of the 30 level, the one that was being exploited at that time. Plumboselite occurs on clauthalite and clearly formed as an oxidative alteration. Other associated minerals on the specimens include smithsonite, mimetite, and vaterite. The name is in reference to the mineral's chemical composition, *plumbo* (for lead) and *sel* (for selenite). Electron microprobe analysis (Cameca SX50) yielded: CaO 0.09, PbO 84.92, SeO<sub>2</sub> 14.95, total 99.96 (wt%), corresponding to Pb<sub>2.92</sub>Ca<sub>0.01</sub>Se<sub>1.03</sub>O<sub>5</sub> on the basis of 15 O atoms per formula unit. The ideal formula is Pb<sub>3</sub>O<sub>2</sub>(SeO<sub>3</sub>), which requires PbO 85.78 and SeO<sub>2</sub> 14.22, total 100 (wt%). The mineral occurs in subparallel to divergent clusters of thin, flattened, colorless fibers up to 0.3 μm in length, but not exceeding 5 μm in width and 2 μm in thickness. The fibers are elongated parallel to [001] and flattened on {010}, the only form observed. Plumboselite fibers are transparent, have a white streak and a dull to adamantine luster. The mineral is brittle. No cleavage, parting or fracture was observed due to the size of the fibers. Mohs hardness ~ 2–3,  $D_{\text{calc}} = 7.814 \text{ g/cm}^3$ . Optically, plumboselite is biaxial. Sign,  $2V$ , and dispersion were not determined due to the size of the crystals and the indices of refraction being higher than index fluids available to the authors. The optical orientation could be only partially determined:  $X = c$ , extinction is parallel and fibers are length fast in all orientations. The five strongest X-ray powder diffraction lines are [ $d$  in Å ( $I_{\text{obs}}$  %,  $hkl$ ): 3.155 (100, 221), 1.956 (26, 042, 402), 2.886 (22, 311, 002), 1.713 (21, 223), and 2.691 (17, 040)]. Cell parameter refinement yielded  $a = 10.5505(8)$ ,  $b = 10.7601(9)$ ,  $c = 5.7671(5)$  Å,  $V = 654.71(9)$  Å<sup>3</sup>. The crystal structure of plumboselite was solved by direct methods and refined in the space group  $Cmc2_1$  to  $R_1 = 0.0371$ , and because of the small crystal size, the data set was limited to a resolution of 1.1 Å. Cell parameters from single-crystal diffraction data (Rigaku R-AXIS Rapid II curved imaging plate detector, MoK $\alpha$  radiation) are  $a = 10.5384(11)$ ,  $b = 10.7452(13)$ ,  $c = 5.7577(7)$  Å,  $V = 651.98(12)$  Å<sup>3</sup> ( $Z = 4$ ). The structure-type is unique and identical to that of the previously described synthetic Pb<sub>3</sub>O<sub>2</sub>(SeO<sub>3</sub>). It contains two unique Pb

sites and one Se site. The structure is based on double [O<sub>2</sub>Pb<sub>3</sub>] chains of edge-sharing oxo-centered [OPb<sub>4</sub>] tetrahedra along  $c$ , between which are sited SeO<sub>3</sub> triangles. The holotype specimen is preserved in the collections of the Mineral Sciences Department, Natural History Museum of Los Angeles County, catalogue number 63264G. **F.C. and G.D.G.**

### RAKOVANITE\*

A.R. Kampf, J.M. Hughes, J. Marty, M.E. Gunter, and B. Nash (2010) Rakovanite, Na<sub>3</sub>{H<sub>3</sub>[V<sub>10</sub>O<sub>28</sub>]} · 15H<sub>2</sub>O, a new member of the pascoite family with a protonated decavanadate polyanion. *Can. Mineral.*, 49(2), 595–604.

Rakovanite is a new member of the pascoite group, in which structures are based upon the decavanadyl (V<sub>10</sub>O<sub>28</sub>)<sup>6-</sup> polyanion cluster. The mineral is rare and occurs as crystalline crusts on fractures in sandstones of the Sunday and West Sunday mines in San Miguel County, Colorado, U.S.A. It is formed by oxidation of montroseite-corvusite assemblages, where it occurs with calcite, montroseite, corvusite, hughesite, hewettite, pascoite, and sherwoodite, as well as with other as yet unidentified vanadium phases. The transparent, orange crystals are up to 1 mm in size, with habits ranging from blocky to prismatic along [100] and with striations parallel to [100]. The streak is orange-yellow and the mineral has an adamantine luster. It is not fluorescent. The fracture is conchoidal and there is neither parting nor cleavage. Rakovanite is biaxial (+) with  $\alpha = 1.776(5)$ ,  $\beta = 1.803(5)$ ,  $\gamma = 1.910(6)$ , and  $2V = 56(1)$  at 540 nm. It is pleochroic:  $X$  light yellow,  $Y$  orange-yellow,  $Z$  yellowish orange and  $Z > Y > X$ . The empirical formula ( $\Sigma V = 10$  apfu) is (Na<sub>2.90</sub>K<sub>0.07</sub>Ca<sub>0.01</sub>Al<sub>0.01</sub>)<sub>Σ2.99</sub>{H<sub>2.98</sub>[V<sub>10</sub>O<sub>28</sub>]} · 15H<sub>2</sub>O or ideally Na<sub>3</sub>{H<sub>3</sub>[V<sub>10</sub>O<sub>28</sub>]} · 15H<sub>2</sub>O. All water molecules were found in the structure determination. The crystal structure was determined by single-crystal XRD: monoclinic, space group  $P2_1/n$ ,  $a = 12.0248(17)$ ,  $b = 17.121(3)$ ,  $c = 18.140(3)$  Å,  $\beta = 106.242^\circ$ ,  $V = 3585.5(9)$  Å<sup>3</sup> ( $Z = 4$ ). The structure was refined to final agreement indices of  $R_1 = 0.038$  and  $wR_2 = 0.074$ . The strongest four lines in the powder-diffraction pattern [ $d$  in Å ( $I$  %,  $hkl$ )] are: 11.270 (100, 101), 7.696 (81, 021), 8.709 (78, 002), and 6.892 (63, 120). While rakovanite is closely related to other pascoite-group minerals, its (V<sub>10</sub>O<sub>28</sub>)<sup>6-</sup> polyanion differs in having three essential H atoms, i.e., H<sub>3</sub>(V<sub>10</sub>O<sub>28</sub>)<sup>3-</sup>. In contrast to their rarity in Nature, numerous synthetic protonated decavanadates are known, and rakovanite is the natural analogue of synthetic [Na<sub>2</sub>(H<sub>2</sub>O)<sub>10</sub>][H<sub>3</sub>V<sub>10</sub>O<sub>28</sub>{Na(H<sub>2</sub>O)<sub>2</sub>}] · 3H<sub>2</sub>O. Linkages between decavanadyl polyanions involve bonds with interstitial Na and extensive hydrogen bonding. The interstitial complex of rakovanite that connects the polyanion clusters is {Na<sub>3</sub>(H<sub>2</sub>O)<sub>15</sub>}<sup>3+</sup>. **M.W.**

### STRONTIOFLUORITE\*

V.N. Yakovenchuk, G.Y. Ivanyuk, Y.A. Pakhomovsky, E.A. Selivanova, J.A. Korchak, and A.P. Nikolaev (2010) Strontiofluorite, SrF<sub>2</sub>, a new mineral species from the Khibiny Massif, Kola Peninsula, Russia. *Can. Mineral.*, 48, 1487–1492.

Strontiofluorite was found at two localities, Mt. Koashva and Mt. Kitchepakhk, in the Khibiny alkaline massif in a lenses of sodalite-microcline-aegirine rock within host urtite.

It is associated with astrophyllite, burbankite, chlorobartonite, fluorite, fluorapatite, and polezhaevite-(Ce). The mineral forms euhedral cubo-octahedral crystals up to 0.3 mm in diameter, larger spherical grains (1 mm) and also fine-grained compact massive aggregates surrounding groups of polezhaevite-(Ce) crystals in cavities formed by the leaching of burbankite. It also occurs as pseudomorphs after lamprophyllite. Strontiofluorite is translucent, has a perfect {111} cleavage and a white streak. It has a measured density of 4.05 g/cm<sup>3</sup> (calculated density 4.11 g/cm<sup>3</sup>) and Mohs hardness of 4. Compositional data (electron microprobe, WDS) gave the following empirical formulae for the Mt. Koashva and Mt. Kitchevakhk samples, respectively: (Sr<sub>0.56</sub>Ca<sub>0.27</sub>Na<sub>0.09</sub>Ba<sub>0.06</sub>Ce<sub>0.02</sub>La<sub>0.02</sub>Nd<sub>0.01</sub>)<sub>Σ=1.03</sub>F<sub>2</sub> and (Sr<sub>0.88</sub>Ca<sub>0.08</sub>Na<sub>0.02</sub>Fe<sub>0.02</sub><sup>2+</sup>Ba<sub>0.01</sub>Mn<sub>0.01</sub>)<sub>Σ1.02</sub>F<sub>2</sub> or, ideally, SrF<sub>2</sub>. Although no single-crystal XRD data are reported, the X-ray powder diffraction pattern allowed identification as a fluorite-type structure (space group *Fm* $\bar{3}$ *m*) and refinement of the unit-cell: *a* = 5.713(8) Å, *V* = 186.5(3) Å<sup>3</sup> (*Z* = 4). The first nine measured *d*<sub>hkl</sub> [*d* in Å (*I* %, *hkl*)] are: 3.324 (100, 111), 2.886 (20, 200), 2.029 (90, 220), 1.731 (60, 311), 1.654 (10, 222), 1.434 (20, 400), 1.317 (30, 331), 1.172 (50, 422), 1.105 (20, 511). The proposed origin of strontiofluorite at Mt Koashva is by the reaction of burbankite with a HF-bearing fluid, leading to the formation of strontiofluorite, polezhaevite-(Ce), fluorite, villaumite, CO<sub>2</sub>, and H<sub>2</sub>O. **M.W.**

**UNNAMED (As,Sb,U)-RICH (Ta,Ti)-OXIDE: UM2010-02-O:  
AsMnSbTaTiU†**

A. Pieczka (2010) Primary Nb-Ta minerals in the Szklary pegmatite, Poland: new insights into controls of crystal chemistry and crystallization sequences. *American Mineralogist*, 95, 1478–1492.

Two inclusions in betafite are close to homogeneous with compositions (mean and range of three analyses) of: WO<sub>3</sub> 0.13 (0–0.4), Nb<sub>2</sub>O<sub>5</sub> 6.04 (6.85–7.01), Ta<sub>2</sub>O<sub>5</sub> 19.06 (17.84–21.22), TiO<sub>2</sub> 8.06 (7.13–8.86), ThO<sub>2</sub> 1.04 (0.88–1.16), UO<sub>2</sub> 20.23 (20.04–20.34), As<sub>2</sub>O<sub>3</sub> 11.93 (11.18–12.69), Sb<sub>2</sub>O<sub>3</sub> 17.72 (16.83–18.96), Bi<sub>2</sub>O<sub>3</sub> 0.48 (0.34–0.62), FeO 2.51 (2.19–2.83), MnO 9.82 (9.76–9.87), CaO 0.32 (0.31–0.34), PbO 0.95 (0.82–1.08), Na<sub>2</sub>O 0.07

† For a complete listing of all IMA-validated unnamed minerals and their codes, see: <http://pubsites.uws.edu.au/ima-cnmc/>.

(0.05–0.09), K<sub>2</sub>O 0.04 (0.03–0.05), Total 99.29 (99.05–99.66), (Zr, Sn, and Mg sought but not detected) giving an empirical formula [(Mn,Fe)<sub><3</sub>U<sub>>1</sub>]<sub>Σ=4</sub>(As<sub>2</sub>Sb<sub>2</sub>)<sub>Σ=4</sub>[(Ta,Nb)<sub>>2</sub>Ti<sub><2</sub>]<sub>Σ=4</sub>O<sub>20</sub>, idealized as Mn<sub>3</sub>UAs<sub>2</sub>Sb<sub>2</sub>Ta<sub>2</sub>Ti<sub>2</sub>O<sub>20</sub>. No other data are reported. The mineral is associated more generally, in an extremely As- and Sb-rich, Nb-Ta assemblage, with columbite-(Fe), columbite-(Mn), tantalite-(Mn), stibiocolumbite, stibiotantalite, and holtite. **D.G.W.S.**

**UNNAMED Pd-SULFOTELLURIDE: UM2010-04-S:PdTe†**

Y. Fedortchouk, W. LeBarge, and A. Y. Barkov (2010) Platinum-group minerals from a placer deposit in Burwash Creek, Kluanine area, Yukon Territory, Canada. *Can. Mineral.*, 48, 583–596.

Enclosed by a grain of Pt-Fe alloy, the mineral has the composition Pd 73.65, Pt 1.28, Au 1.37, Te 19.83, S 3.87 or (Pd<sub>10.57</sub>Au<sub>0.11</sub>Pt<sub>0.10</sub>)<sub>Σ10.78</sub>Te<sub>2.37</sub>S<sub>1.84</sub> (based: 15 apfu). Only compositional information is reported although the mineral may be assumed to be opaque with a metallic luster. It could be a S-analogue of either miessite (Pd<sub>11</sub>Te<sub>2</sub>Se<sub>2</sub>), or UM1996-02-As:PdTe (Pd<sub>11</sub>Te<sub>2</sub>As<sub>2</sub>); or a Te,S-analogue of isomertieite (Pd<sub>11</sub>Sb<sub>2</sub>As<sub>2</sub>). **D.G.W.S.**

**UNNAMED Mn-ANALOGUE OF RASLAKITE: UM2010-06-SiO:CaFeHMnNaNbREETiZr†**

R.K. Rastsvetaeva, S.M. Aksenov, and N.V. Chukanov (2010) Crystal structure of the Mn analogue of raslakite, a new representative of the eudialyte group. *Dokl. Chem.*, 431(1), 76–81.

X-ray diffraction data from a colorless, isometrically shaped single crystal showed the mineral is trigonal, space group *R*3, with *a* = 14.218(1), *c* = 30.349(2) Å, *V* = 5313.1(1) Å<sup>3</sup> and *Z* = 3, for an empirical formula determined “by local X-ray spectral analysis” (presumably electron-microprobe analysis) of Na<sub>13–15</sub>(H<sub>3</sub>O)<sub>x</sub>K<sub>0.1</sub>REE<sub>0.6–0.7</sub>Ca<sub>4.1–4.3</sub>Mn<sub>1.6–1.8</sub>Fe<sub>0.5–0.6</sub>Zr<sub>2.55–2.7</sub>Ti<sub>0.3–0.45</sub>Nb<sub>0.3–0.4</sub>Si<sub>25.7</sub>(SO<sub>4</sub>)<sub>0.4</sub>Cl<sub>0.2</sub>. Together with the detailed structural analysis, this leads to an idealized formula: [Na<sub>3</sub>(H<sub>3</sub>O)]<sub>15</sub>[Ca<sub>3</sub>Mn<sub>3</sub>]Na<sub>3</sub>Zr<sub>3</sub>(Si,Ti)[Si<sub>25</sub>O<sub>72</sub>OH](OH)<sub>2</sub>·2H<sub>2</sub>O. The mineral occurs in a pegmatoid, foyaite-like rock from the alkali syenite complex at Mount Alluaiv, Lovozero Massif, Kola Peninsula, Russia. It appears to be compositionally very similar indeed to UM2006-17-SiO:CaClFeHMnNaZr (which was reported from the same locality). **D.G.W.S.**