New Mineral Names**†

Dmitriy I. Belakovskiy1, Fernando Cámara2, Olivier C. Gagne3 and Yulia Uvarova4

1Fersman Mineralogical Museum, Russian Academy of Sciences, Leninskiy Prospekt 18 korpus 2, Moscow 119071, Russia
2Dipartimento di Scienze della Terra, Università di degli Studi di Torino, Via Valperga Caluso, 35-10125 Torino, Italy
3Department of Geological Sciences, University of Manitoba, Winnipeg, Manitoba R3T 2N2, Canada
4Mineral Resources Flagship, CSIRO, ARRC, 26 Dick Perry Avenue, Kensington, Western Australia 6151, Australia

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CAMARONESITE*


Camaronesite (IMA 2011-094), ideally [Fe3+(H2O)2(PO4OH)]2(SO4)3·H2O, is a new mineral found near the village of Cuya in the Camarones Valley, Arica Province, Chile. Camaronesite occurs in boulders from a leached outcrop located approximately at 19°5′58″S 70°7′6″W, high on the NW side of the steep Camarones Valley. The rocks in the area are faulted and metamorphosed lavas, lithic tuffs and marine sediments (shales and sandstones) bearing sulfide accumulations (pyrite with lesser arsenopyrite, sphalerite, etc.) oxidized under increasingly arid conditions, yielding extensive suites of secondary sulfates, arsenates, arselenes, chlorides, etc. Boulders containing camaronesite have zoned structures with yellow-brown limonitic exterior coatings followed by sulfate assemblages and then sulfide-rich cores. Sulfate minerals, notably camaronesite and copiapite, are present in vugs. The mineral occurs in assemblage with anhydrite, botryogen, chalcantite, copiapite, holotrichite, hexahydrite, römerite, rozenite, and szomolnokite, as lavender-colored crystals up to several millimeters. Rarely crystals occur as drusy aggregates of tablets up to 0.5 × 0.02 mm. Tablets are flattened on {001} and exhibit the forms {010}, {104}, {015}, and {018}. The mineral is transparent with white streak and vitreous luster. It is brittle with irregular, conchoidal and stepped fracture. Cleavage is perfect on {001}. Mohs hardness is 2½; Dmeas = 2.43(1), Dcalc = 2.383 g/cm³. Camaronesite is optically uniaxial (+), ω = 1.612, and ε = 1.621 (white light). The pleochroism is O (pale lavender) > E (colorless). The mineral is slowly soluble in concentrated HCl and extremely slowly soluble in concentrated H2SO4. The main bands in the Raman spectrum of camaronesite are (cm⁻¹): 1014, 1080, 937 (PO3⁻ and SO4²⁻ vibrations); 526, 305, 254, and 227. It shows a strong, broad OH-stretching band running from ~3600 to 2800 cm⁻¹ with possible components near 3463, 3363, and 3140 cm⁻¹. Evidence for molecular water comes from a narrower H₂O-bending region centered at ~1610 cm⁻¹ with likely components at ~1638 and 1596 cm⁻¹. Average electron probe WDS analyses [wt% (range)] is: FeO, 31.84 (30.53–32.54), PO4, 29.22 (28.19–31.28), SO4, 15.74 (15.27–16.32), H2O, 23.94 (21.75–25.64) (based on O analyses); total 100.74. The empirical formula based on 2 P apfu is: Fe1.93(PO4)(SO4)(OH)2.146 H2O. The strongest lines of the X-ray powder diffraction pattern [d Å (I; hkl)] are: 7.74 (45; 101), 7.415 (100; 012), 4.545 (72; 110), 4.426 (26; 018), 3.862 (32; 021,202,116), 3.298 (93; 027,119), 3.179 (25; 208), 2.818 (25; 1 1 1 2,125). Unit-cell parameters refined from the powder data with whole-pattern fitting are: a = 9.0679(10), c = 42.991(6) Å, V = 3061.4 Å³. X-ray single-crystal diffraction study on a crystal fragment 130 × 100 × 10 µm shows the mineral is trigonal, space group R32; a = 9.0833(5), c = 42.944(3) Å, V = 3068.5 Å³; Z = 9. In the crystal structure of camaronesite [refined to R₁ = 0.0228 for 1138 unique I>2σ(I) reflections] three types of Fe octahedra are linked by corner sharing with (PO4) tetrahedra to form polyhedral layers perpendicular to c with composition [Fe3+(H2O)2(PO4)] similar to those in the structure of tarkanite. Two such layers are joined through SO4 tetrahedra (in two half-occupied orientations) to form thick slabs of composition [Fe3+(H2O)2(PO4)]3(SO4)2. The remaining space between the slabs is partially occupied by H₂O groups. The only linkages between the slabs are hydrogen bonds. The most distinctive component in the structure consists of two Fe octahedra linked by three PO4 tetrahedra yielding an [Fe3+(PO4)3] unit, also found in the structures of the coquimbite and paracoquimbite. This unit is also the key component in the sodium super-ionic conductor (NASICON) structure and has been referred to as the lantern unit. The mineral is named camaronesite ([kæm ə:r ‘oun æz ait] for the locality. The description of the new mineral was based on five specimens, designated as cotypes and deposited in the Natural History Museum of Los Angeles County, Los Angeles, California, U.S.A., under catalog numbers 64023–64027. F.C.

* All minerals marked with an asterisk have been approved by the IMA CNMMC.
† For a complete listing of all IMA-validated unnamed minerals and their codes, see http://pubsites.uwyo.edu/ima-cnmnc/.
CHIAPPINOITE-(Y)*

Chiappinoite-(Y) (IMA 2014-040), ideally Y,Mn(SiO₄)₃, was discovered at the Água de Pau volcano (Fogo volcano), São Miguel Island, Azores District, Portugal. The mineral was found in a single fragment of ejectum, 15 cm in diameter, in the exposed river bed of the Ribeira Grande near the locality “Lombadas” (37.775333N, 25.458464W). The mineral was named in honour of Luigi Chiappino (b. 1950), an eminent distinguished mineral collector of Milan, Italy. Chiappinoite-(Y) was found in peralkaline syenitic ejecta produced by plinian eruptions, where it occurs in vugs, in friable matrix composed mainly of albite, quartz, and aegirine, and is associated with astrophyllite, dalyte, elpidite, fluorapatopyrochlore, and kentbrooksite. Chiappinoite-(Y) is transparent and colorless, yet vitreous luster and white streak.

The new mineral forms thin to thick prismatic crystals, up to 1 mm long, elongated on {100} with blunt, chisel-like terminations. The crystal forms observed are {100}, {010}, {001}, {110}, and {001}. Chiappinoite-(Y) does not fluoresce under UV excitation, is brittle, has irregular fracture and perfect cleavage on {001}. Chiappinoite-(Y) is not fluorescent under UV excitation, is brittle, has irregular fracture and perfect cleavage on {001}. The mineral does not react in concentrated HCl, H₂SO₄, and HNO₃. It is optically biaxial (–), α = 1.590, β = 1.598, and γ = 1.598 (white light)*; 2Vₜₜₜ = 24(1°) and 2Vₜₜₜ = 25.4°; X = c, Y = b, Z = a. The mineral is non-pleochroic and does not display dispersion. The averaged 6 point WDS electron probe analyses on 2 crystals gave [wt% (range)]: Na₂O 0.30 (0.14–0.49), CaO 1.33 (1.09–1.50), MnO 4.12 (3.78–4.62), FeO 0.59 (0.36–0.86), Y₂O₃ 12.43 (11.82–13.22), La₂O₃ 1.07 (0.71–1.59), Ce₂O₃ 2.84 (2.11–3.67), Pr₂O₃ 0.34 (0.27–0.38), Nd₂O₃ 1.35 (1.18–1.56), Sm₂O₃ 0.47 (0.34–0.64), Gd₂O₃ 1.12 (0.91–1.43), Dy₂O₃ 1.70 (1.41–1.93), Er₂O₃ 1.39 (1.22–1.56), Yb₂O₃ 1.03 (0.91–1.16), SiO₂ 68.76 (68.31–69.34), total 98.84. The empirical formula calculated on the basis of 28 O apfu is (Y₁₋₀.₂₃ Y₂₋₀.₃₂ M₈₋₀.₇₈)ₓ(Ca₀.₅₁ Nb₀.₂₁)ₓ(O₄₋₀.₃₄ Sι₀.₄₃)ₓPr₂O₃₋₀.₁₂₃ₓ Mn₂O₃₋₀.₁₂₅ₓ Fe₂O₃₋₀.₃₉ₓ Sι₂O₃₋₀.₉₀ₓ. The strongest lines of the X-ray powder diffraction pattern are [d Å (P%; hkl)]: 9.84 (90; 002), 4.129 (52; 024), 3.977 (48; 114), 3.544 (100; 211), 4.20 (48; 222), 2.999 (71; 044,204), 2.478 (67; 310,406,206), and 2.065 (57; 048,262,208,165,325,066). The crystal structure of chiappinoite-(Y) was solved by direct methods and refined to R = 2.55%. The mineral is orthorhombic, Ibam, a = 5.7549(3), b = 15.2342(5), c = 19.6418(14) Å, V = 2260.6 Å³, and Z = 4. The crystal structure of chiappinoite-(Y) is based on three-tetrahedra-thick silicate layers that consist of three components. The central component of each layer is sinusoid batiste-like chain extending along the a axis. The chains are linked through four-membered silicate rings along the b axis. This results in three-tetrahedra-thick silicate layers that contain four- and six-membered rings. There are two sites, dominantly occupied by Y and Mn, in between the silicate layers, and these sites link the layers along the c axis. The structure of chiappinoite-(Y) is similar to crystal structures of synthetic PrNaSi₂O₆ and NdNaSi₂O₆. Five cotype specimens are deposited in the collections of the Mineral Sciences Department, Natural History Museum of Los Angeles County. Yu.U.

DOMEROCKITE*

Domerockite (IMA 2009-016), ideally Cu₉(AsO₄)(AsO₃OH)(OH); H₂O, is a new mineral from the Dome Rock Mine, South Australia, which is situated in Lower Proterozoic metasediments of the Willyama Complex on the northern flank of an east–west striking range. Copper ore-bodies are interpreted as being hypogene in origin, and to have formed at intermediate temperatures from ascending waters related to the invasion of the metasediments by granite intrusives. A suite of secondary arsenate minerals is formed as late-stage supersgene minerals under low-temperature conditions, when Cu and As were provided as a result of weathering of sulfide ore minerals, principally chalcocite, chalcopyrite, and arsenopyrite. The Dome Rock Mine is the type locality of hylobrownite. Domerockite is associated with other arsenates, including cobaltaustinite, agardite-(Y), arseniosiderite, clinoclase, erythrite, lavendulan, metazeuxite, olivenite, scorodite, and smolyanovite. Domerockite is found as equant, short prismatic or tabular crystals up to 0.3 × 0.2 mm, which are generally arranged in subparallel intergrowths. Major crystal forms are {100}, {010}, and {001}, and minor: {011}, {012}, and {212}. Domerockite is translucent and bluish green colored, with a pale green streak. It has a vitreous luster and displays no fluorescence under UV irradiation. The mineral is brittle with an uneven fracture, a Mohs hardness of ~3. Calculated densities are 4.48 and 4.44 g/cm³, based on the empirical chemical formula and the simplified formula derived from the structure refinement, respectively. Optically domerockite is biaxial (–), α = 1.798(4), β = 1.814(4), γ = 1.817(4)°; 2Vₜₜₜ = 46°; pleochroism is very weak with X pale greenish yellow, Y greenish blue, Z greenish blue; absorption X < Y < Z (orientation is uncertain). The main bands in the Raman spectrum of domerockite are related to vibrations AsO₄ tetrahedra (cm⁻¹): 875, 850, 822, and 808 (v₁ and v₂ modes); 478 and 445 (v₃ modes); 390 and 360 (v₄ modes). Remaining bands below 650 cm⁻¹ are attributed to Cu–O stretching and lattice vibrations. Only two weak O–H stretching vibrations at ~3235 and 3420 cm⁻¹ are observed in the Raman spectrum. FTIR spectrum shows two bands at 3232 and 3425 cm⁻¹, which are attributed to OH stretching vibrations, and a low-intensity, broad band centered at ~1660 cm⁻¹ that can be attributed to H–O–H bending of the H₂O groups. The average of 14 electron probe WDS analysis [wt% (range)] is: CuO 52.04 (51.30–53.36), ZnO 0.78 (0.42–1.51), BaO 0.11 (0.06–0.18), As₂O₅ 37.67 (36.68–38.65), P₂O₅ 0.32 (0.24–0.43), SiO₂ 0.24 (0.12–0.35), H₂O 8.84 (by difference), total 100.00. The empirical formula calculated on the basis of 12 O apfu is (Cu₉₋₀.₁₄ Zn₋₀.₀₆)ₓ(As₋₀.ₓ₋₀.₃₂ P₋₀.₄₂ Sι₋₀.₃₂)ₓ(OH)ₓ₋₀.₁₄ H₂O. The strongest lines of the X-ray powder diffraction pattern are [d Å (P%; hkl)]: 4.716 (90; 002), 4.129 (52; 024), 3.977 (48; 114), 3.544 (100; 211), 4.20 (48; 222), 2.999 (71; 044,204), 2.478 (67; 310,406,206), and 2.065 (57; 048,262,208,165,325,066).
mm was used for a single-crystal study, yielding a triclinic symmetry, space group $\overline{P}$, $a = 5.378(11)$, $b = 8.962(18)$, $c = 9.841(2)$ A, $\alpha = 75.25(3)$, $\beta = 83.56(3)$, $\gamma = 79.97(3)$$^\circ$. $V = 450.5$ A$^3$, $Z = 2$. The crystal structure was solved by direct methods and refined to $R_I = 7.44\%$ using 2164 $\{F \geq 4\sigma(F)\}$ reflections. The structure comprises $[CuO_4]$ (O = O, OH) chains of CuO$_6$ edge-sharing, distorted octahedra that extend along [10$\overline{1}$] and are decorated by AsO$_4$ tetrahedra to form sheets in the (010) plane. Dimers of edge-sharing [CuO$_4$(OH)$_2$] octahedra share corners with dimers of edge-sharing [CuO$_4$(OH)] square pyramids to form zigzag chains that extend along [101]. The chains lie between and link to the sheets by sharing corners of octahedra, square pyramids, and tetrahedra to form a heteropolychedral framework. The name is for the locality. The type specimen is housed in the collection of the Department of Mineralogy, South Australian Museum, Adelaide, South Australia. F.C.

ERIKAPOHLITE*

J. Schlüter, T. Malcherek, B. Mihailova, and G. Gebhard (2013) The new mineral erikapohlite, Cu$_3$(Zn,Cu,Mg)$_5$Ca$_2$(AsO$_4$)$_3$·2H$_2$O, the Ca-dominant analog of keyite, from Tsumeb, Namibia. Neues Jahrbuch für Mineralogie Abhandlungen, 190/3, 319-325.

The new mineral erikapohlite (IMA 2010-090), ideally Cu$_3$(Zn,Cu,Mg)$_5$Ca$_2$(AsO$_4$)$_3$·2H$_2$O, the Ca-dominant analog of keyite, was discovered in the specimen purchased at the Tsumeb Mine, Namibia. It was previously mentioned as an unknown Ca-Cu-Zn-As mineral GS 5 (Cebharr 1999). Erikapohlite is a supergene mineral formed by alteration of tennantite-rich ore on level 44 in the oxidized zone of the Tsumeb mine, a dolostone-hosted, hydrothermal polymetallic ore deposit. It occurs in the seams up to 0.7 mm wide of very thin lamellar microcrystals in granular quartz and closely associated with lammerite, conichalcite, unidentified arsenate and arsenospathite, joliotite, nielsbohrite, uranosilite, and uranotungstite. The new mineral does not fluoresce in UV light. The Raman spectrum is similar to that of keyite. The scattering below 1000 cm$^{-1}$ is dominated by internal and external AsO$_4$ vibrations, while the peaks near 3000 and 1500 cm$^{-1}$ are related to O-H stretching and H-O-H bond bending, respectively. The slight difference in the relative intensities compare to keyite is likely due to orientation effects. The peak near 3170 cm$^{-1}$ might be related to surface and/or interstitial H$_2$O. The average of 155 electron probe WDS analysis [wt% (range)] is CuO 22.42 (17.71-33.35), ZnO 14.45 (3.42-20.14), CaO 8.21 (6.25-8.89), MgO 2.21 (0.09-6.77), FeO 0.03 (0-0.34), As$_2$O$_5$ 51.02 (47.29-54.77), H$_2$O (by difference) 1.66, total 100.00. No other elements with $Z > 8$ were detected. The empirical formula based on 26 O apfu is Cu$_9$(Zn$_{2+4}$Cu$_{0.3}$Mg$_{0.7}$Fe$_{0.6}$)(Cu$_{4.1}$Ca$_{0.4}$As$_{0.2}$)$_{2+7}$·$1.29H$_2$O. Small zones in erikapohlite are Mg- or Cu-dominant, representing not yet described new mineral species. Single-crystal X-ray study could not be performed due to the lack of suitable crystals. The powder X-ray data were obtained using synchrotron radiation ($\lambda = 0.50$ Å) and indexed in monoclinic space group $C2/c$ with the unit-cell parameters refined to $a = 12.6564(6)$, $b = 12.7282(8)$, $c = 6.9148(3)$ Å, $\beta = 113.939(4)^\circ$, $V = 1018.11$ Å$^3$, $Z = 2$. The strongest lines of the powder XRD pattern [d Å ($\beta$; hkl)] are: 3.304 (49; 112), 3.160 (32; 002), 2.982 (100; 400), 2.788 (40; 240), 2.764 (14; 402), 1.718 (10; 542), 1.650 (10; 423). The weak peaks $d = 4.77$, $5.07$, and $6.8$ Å, which do not match this cell are likely belong to admixed mineral(s). The cell corresponds to that of keyite transformed to standard setting $C2/c$ instead of $I2/a$. This cell choice reveals the relation of keyite structure to the structure of alluaudite-group arsenate nickenichite. Both structures based on a framework of chains of edge-sharing, distorted octahedra combined with isolated AsO$_4$tetrahedra. Within this framework two types of channels extend along [001]; channel I contains Na in nickenichite and is occupied by Cu$^{2+}$ and H$_2$O in keyite. Channel II contains Ca and Cu in nickenichite, while in keyite it is only occupied by Cu atoms. The Rietveld refinement for erikapohlite based on keyite structure set in space group $C2/c$ fit the composition Cu$_9$(Zn$_{2+4}$Mg$_{0.5}$Ca$_{0.5}$)$_2$(AsO$_4$)$_3$·1.41H$_2$O, which is close to the empirical formula of erikapohlite, considering that some Zn might be replaced by Cu. Contrary to Cd in the keyite structure, Ca in erikapohlite is 7-coordinated. Erikapohlite is named in honor of the famous mineral collector Erika Pohl (b. 1919) who donated in 2004 her (one of the world’s best) private mineral collection of more than 40 000 specimens to the Bergakademie Freiberg, Saxony, Germany, on the condition that it should be accessible to a broad public and scientifically supervised. As “terra mineralia” her collection is now on display in the Freudenstein Castle in the center of Freiberg. The type specimen has been deposited at the Mineralogisches Museum, University of Hamburg, Germany. D.B.

Reference cited


HEISENBERGITE*


Heisenbergite (IMA 2010-076), a new uranyl oxyhydroxide, is the seventh new U mineral (after arsenovanmeerscheite, arsenuranspathite, joliotite, nielsbohrite, uranosilite, and uranotungstite) discovered in the Krunkelbach Valley near Menzenschwand in the Southern Black Forest, Baden Württemberg, Germany. It was first found in El Sherana Mine, South-Alligator-River-District, Northern Territory of Australia, where it had been described as an unnamed uranium oxide (mineral B) (Threadgold 1960). Later it was identified at Joachimsthal, Czech Republic (Ondruš et al. 1997). In the IMA list of valid unnamed minerals these phases are listed as UM 1960-04-O:HU and UM 1997-36-O:HU, respectively. At Menzenschwand, it was previously mentioned (Walenta 1976) as identical to “mineral B” of Joachimsthal.

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in a deep yellow to golden yellow incrustation (crystals up to 0.15 × 0.001–0.002 mm elongated parallel to Z) on uraninite, anglesite, and dumontite. In places, it is intimately intergrown with another yellow “mineral C” (Threadgold 1960) (probably pararasaite). At Joachimsthal, heisenbergite forms thick, glassy orange-brown coatings up to 0.5 mm thick with indistinct fibrous structure and associated with uraninite, richetite, antlerite, zeunerite, metazeunerite, nováčekite, and langite (Ondruš et al. 1997). Heisenbergite is opaque to translucent, has yellow streak, vitreous luster, irregular fracture, and estimated Mohs hardness of ~2. Cleavage and parting were not observed. The density could not be measured; \( D_{\text{calc}} = 5.14 \text{ g/cm}^3 \). It is non-fluorescent. The mineral is easily soluble in 1:1 HCl and 1:1 HNO₃. In transmitted light the mineral is transparent (pleochroism not mentioned) with \( \alpha = 1.733(3), \gamma = 1.800(5) \); \( \beta \) is close to \( \gamma \) (optically negative). \( 2\theta \) could not be measured. The crystals have positive elongation and straight extinction. Raman spectra of heisenbergite has similarity to those of schoepite, pararasaite, and synthetic uranyl oxyhydroxides. Based on the interpretation of the IR spectrum of synthetic UO₂·H₂O the bands (cm⁻¹) 338, 438, 538 assigned to ν(U-O) stretching vibrations; 247 to δ(U-O) bending; strong bands 742, 799, and 829 attributed to \( v_1 \) symmetric stretching of the UO₆²⁻ group. The OH stretching vibrations of OH group or molecular water in the range of 3000–3500 cm⁻¹ are present but weak to allow reliable attribution. On the basis of Raman spectral data it is suggested that two distinct type of coordination polyhedra for uranium are present in the heisenbergite structure. An average of 15 electron probe WDS analyses of heisenbergite [wt% (range)] is: UO₂ 88.58 (85.81–90.94), PbO 1.31 (0.82–1.69), BaO 0.17 (0.06–0.30), CaO 0.13 (0.10–0.18), H₂O (by difference) 9.81, total 100.00. The empirical formula based on 5 O atoms is \( {}_{\text{U}}\text{Ba}_{0.026} \text{PbO}_{0.015} \text{CaO}_{0.013} \text{BaO}_{0.013} \text{H}_{0.065} \text{O}_{0.5} \). Idealized formula could be written as UO₂(OH)₆·H₂O, or UO₂·2H₂O. Chemical composition of heisenbergite is similar to those of schoepite UO₂·2.25H₂O, metaschoepite UO₂·2H₂O, and paulscherrerite UO₃(OH). No crystals were found to be suitable for a single-crystal study. The strongest lines of the X-ray powder diffraction pattern \( [d \text{ Å} (\%); \ hkl] \) are: 7.92 (10; 111), 7.25 (9; 002), 5.96 (4; 201), 3.577 (7; 321), 3.27 (9; 322, 400), 1.992 (4; 055, 603). The dimensions of an orthorhombic unit cell derived from the powder data are: \( a = 13.10(1), b = 13.76(1), c = 14.50(1) \) Å, \( V = 2613.71 \text{ Å}^3, Z = 24 \). Possible space groups are: \( P2₁2₁2₁, Pna₂₁ \), \( Pnma \). The mineral is named for the famous German physicist Werner Heisenberg (1901–1976). Type material is deposited at the Staatliches Museum für Naturkunde in Stuttgart. D.B.

References cited


Ianbruceite (IMA 2011-049), ideally \([\text{Zn}_2\text{(OH)}_3\text{(H}_2\text{O})(\text{AsO}_4)](\text{H}_2\text{O})_2\), is a new mineral from the Tsumeb mine, Otjikoto (Oshikoto) region, Namibia. It is named in honor of Ian Bruce (b. 1969) who significantly contributed to the mineral collections of museums worldwide and was a prime mover in the reopening of the Tsumeb mine for mineral collecting. It was mentioned earlier as a potential new species GS17 from “Zinc pocket” on the 44 level of Tsumeb mine (Gebhard 1999). Ianbruceite is a supergene mineral and was found in a specimen from the oxidation zone in association with coarse white leiteite, dark blue köttigite, and minor legrandite and adamite. The new mineral forms aggregates of thin flakes and tapered platy crystals up to 80 μm by a few micrometers thick, and rounded, ellipsoidal aggregates up to 0.5 mm. The dominant crystal forms are \( 100 \) and (prominent) \( 011 \) and \( 001 \). Ianbruceite is sky blue to very pale blue with a white streak, vitreous luster, and perfect cleavage parallel to \( 100 \). No parting or twinning was observed, as well as no fluorescence under UV light. Ianbruceite is flexible and does not fracture but deforms plastically. Mohs hardness is 1, and \( D_{\text{calc}} = 3.197 \) g/cm³. Ianbruceite is optically biaxial (−), \( a = 1.601(2), \beta = 1.660(2), \gamma = 1.662(2) \); \( 2V_{\text{calc}} = 18(2) \), and \( 2V_{\text{obs}} = 20\). \( X \) to \( ν = 12.0° \) (in \( β \) obtuse), \( Y \parallel b, Z \parallel c = 47° \) (in \( β \) obtuse). It is non-pleochroic in the (100) plane; the dispersion is \( r < ν \) weak. Raman spectrum shows the following bands (cm⁻¹): a sharp peak at 3600 (an O-H stretch); a broad envelope centered on 3224 and weak shoulders at 3441 and 3242 (H₂O stretching vibrations); a prominent peak at 840 (As⁵⁺-O stretching vibrations); peaks at 534, 448, and 420 (Zn-O stretching vibrations and bending vibrations of the (AsO₄)⁵⁻ groups), and a peak at 192 (lattice mode). The Fourier transform IR spectra contained the following features (cm⁻¹): a broad envelope centered at ~3000 and sharp peaks at ~1600 and ~1670 (H₂O stretches and H-O-H bonds; fine structures in the broad envelope around 3500 (the presence of (OH)); strong peaks at 853, 838, 774, and 750 (As³⁺-O stretching vibrations); a weak shoulder at ~690 (As³⁺-O stretching vibration) and a weak shoulder at ~930 (As³⁺(O-H) bending vibration). The average of 10 electron probe WDS analyses on ianbruceite gave [wt% (range)]: As₂O₅ 36.27 (35.71–39.54), As₂O₄ 1.26 (by structure refinement), Al₂O₃ 0.37 (0.17–0.90), ZnO 49.72 (48.28–51.52), MnO 0.32 (0.16–0.57), FeO 0.71 (0.53–1.05), K₂O 0.25 (0.19–0.30), H₂O 19.89 (by structure refinement), total 108.79 (high total value is due to H₂O loss under the electron beam). The formula calculated on the basis of 8.04 (O+OH+H₂O) pfu is: \( K_{0.02}(\text{Zn}_{0.42}\text{Fe}_{0.35}\text{Al}_{0.12}\text{Mn}_{0.02}) \text{AsO}_{4.99} \text{OH}_{0.04}(\text{H}_2\text{O})_4 \text{AsO}^{5-}_4 \text{H}_2\text{O} )_2\). The strongest lines of the X-ray powder diffraction patterns \( [d \text{ Å} (\%); \ hkl] \) are: 11.29 (100; 100), 2.922 (17; 130), 3.143 (15; 202), 3.744 (11; 300), 2.655 (9; 230), 1.598 (8; 522), 2.252 (7; 222). Ianbruceite is monoclinic, space group \( P2_1/c, a = 11.793(2), b = 9.113(4), c = 10.303(7) \) Å, \( β = 103.859° \), \( V = 712.34 \) Å³, \( Z = 4 \). The crystal structure was solved by direct methods and refined to \( R = 8.6\% \). In the crystal structure of ianbruceite, [5]-coordinated Zn triangular bipyramids share common (OH) vertices to form chains that extend in the c direction. These chains are decorated by Zn octahedra, each of which shares edges with adjacent Zn triangular...
References


INNSBRUCKITE*


Innsbruckite (IMA 2013-038), ideally Mn$_3$(Si$_2$O$_6$)$_4$(OH)$_8$, is a new mineral discovered near Staffelsee (Geier) in the Navis valley, Tyrol, Austria. It was found at the interface between a serpentine body and cherts, in association with rhodochrosite, friedelite, tephroite, spessartine, calcite, apatite, and barite. The mineral was named after the locality as it was found 20 km southeast of Innsbruck, Austria. Innsbruckite occurs as thin plates by {001} crystals. These crystals appear as needle-like in thin section and are up to 150 µm long. The crystals are nearly colorless in transmitted light. Innsbruckite is optically biaxial (-), with a small 2V angle (no direct measurements were possible). Weak pleochroism was observed, and an average refractive index of 1.678 was calculated. The nanoindentation experiments identified an average Berko-vich hardness of 7.9(5) GPa, corresponding to Mohs hardness of 6; $D_{\text{calc}} = 3.191$ g/cm$^3$. Other physical properties were not determined due to the small size of the crystals. Raman spectrum of innsbruckite shows a group of 3 medium to strong peaks in the region 580–860 cm$^{-1}$ (characteristic for innsbruckite), a sharp peak at 1032 cm$^{-1}$; peaks above 900 and below 400 cm$^{-1}$ assigned to Si-O$_6$ and lattice vibrations; a minimum of 7 partly overlapping peaks in the range of 550–730 cm$^{-1}$ related to vibrations within tetrahedra and translations of Mn; and several sharp and intense peaks in the region between 3520 and 3700 cm$^{-1}$ related to the different structural environments of the OH groups. The average of 5 electron probe WDS analyses on innsbruckite gave [wt% (range)]: SiO$_2$ 38.65 (38.08–38.96), Al$_2$O$_3$ 0.23 (0.16–0.19), FeO 0.32 (0.26–0.37), MnO 51.8 (51.21–52.17), MgO 1.20 (1.12–1.30), Cl 0.02 (0.01–0.05), H$_2$O (by structure refinement) 7.91 (7.80–7.96), total 100.12. The formula calculated on the basis of 108 O pfu is: Mn$_{3.15}$Fe$_{0.19}$Mg$_{0.20}$Si$_{2.75}$Al$_{0.26}$O$_{38}$H$_{37.07}$. The crystal structure of innsbruckite was solved and refined to $R_1 = 2.35\%$. The mineral is monoclinic, $Cm$, $a = 17.2760(19)$, $b = 35.957(5)$, $c = 7.2560(8)$ Å, $\beta = 91.359(7)$°, $V = 4506.1$ Å$^3$, and $Z = 2$. The crystal structure of innsbruckite is that of a single-layer silicate and exhibits a previously unknown topology of the tetrahedral silicate sheet. These tetrahedral sheets consist of 8-, 6-, 5- and 4-membered rings in the ratio 2:9:2:1. The silicate sheets alternate with sheets of edge-sharing Mn octahedra, with half of the tetrahedra pointing up and connecting to the upper octahedral sheet and half pointing down and connecting to the lower octahedral sheet. No other minerals or synthetic compounds have structures identical to that of innsbruckite. Holotype material is deposited in the collections of the Museum of Natural History in Vienna (Naturhistorisches Museum Wien), Austria. Yu.U.

IRINARASSITE*


Irinarassite (IMA 2010-073), ideally Ca$_3$Sn$_3$SiAl$_2$O$_{12}$, a new species belonging to the schorlomite group of garnet supergroup was discovered in the metasomatized altered carbonate-silicate xenolith #7 in ignimbrites at 500 m from Vorlan Peak in the central part of the Upper Chegem Caldera, Northern Caucasus, Kabardino-Balkaria, Russia. Altered under sanidine facies conditions, xenoliths in the area between Vorlan and Lakargi mountains are the source of 5 other new garnet-supergroup species: bitikleite, dzhaluite, usturite, elbrusite, and toturite. Irinarassite occurs as small zones and irregular spots typically <10 µm in kimzeyite-kerimisite series garnet (rarely as 2–3 µm crystals) in the complex mixture of minerals (with lakargiite, tazheranite, baddeleyite, baghdadite, magnesioferrite) forming pseudomorphs up to 200 µm after zircon. Pseudomorphs located in a thin endoskarn zone at the immediate contact with unaltered ignimbrite. Laromite, cupidine, rondoformite, As-bearing fluor- and hydroxylellestadite are the main minerals in this zone. Fluorite, rankinite, wollastonite, srebrodolskite, Th-perovskite, and thoria-nite are the minor or accessory minerals while secondary minerals represented by katoite-grossular, ettringite, hillebrandite, bulbfonteinite, and unidentified Ca-hydroxysilicates. Irinarassite is pale brown to yellow with an ashy-yellow streak. It has an irregular fracture and shows no cleavage. The density was not measured due to the small crystals size; $D_{\text{calc}} = 4.301$ g/cm$^3$. Irinarassite is optically isotropic, calculated refractive index is ~1.9. The Raman spectrum of irinarassite is close to those of kerimisite and other Zr-Sn-garnets of the schorlomite and bitikleite groups. Low intensities broad bands (cm$^{-1}$) in 650–850 interval are related to symmetric stretching vibrations of the tetrahedra [ZO$_4$]: 730–750 for [Fe$^{3+}$O$_4$], 750–780 for [TiO$_4$], 780–800 for [AlO$_4$], and >800 for [SiO$_4$]. The band at 580–600 cm$^{-1}$ is attributed to asymmetric stretching vibrations of [Fe$^{3+}$O$_4$]. Large half-width of the strong band ~500 cm$^{-1}$ (bending vibrations [ZO$_4$]) reflects the contribution of tetrahedra occupied by different cations (Al, Si, and Fe$^{3+}$). Band ~300 cm$^{-1}$ is related to bending vibrations (ZO$_4$) and the band below 300 cm$^{-1}$ to translation motions of (ZO$_4$) and Ca. The average of 7 electron probe analysis for the holotype specimen [wt% (range)] is UO$_2$ 0.76 (0.66–0.85), Nb$_2$O$_5$ 0.08 (0–0.13), Sb$_2$O$_5$ 5.99 (5.42–6.81), SiO$_2$ 4.19 (3.92–4.45), TiO$_2$ 7.82 (7.28–8.34), ZrO$_2$ 7.90 (5.81–9.67), SnO$_2$ 23.96 (22.44–26.47), HfO$_2$ 0.20 (0.15–0.25), Al$_2$O$_3$ 11.06 (10.62–11.49), Sc$_2$O$_3$ 0.15 (0–0.32), Fe$_2$O$_3$ 10.05 (8.39–11.37), CaO 36.02 (25.37–26.83), FeO 0.79.
NEW MINERAL NAMES

(0–1.72); total 98.96. The empirical formula based on 12 O pfu is
(Ca2,3+Fe3+,4+O6)(Sn1,02,0Fe6,26,0Sb5,16)2+3+4+6+3(Al1,0Fe1,06,0Si4,46,0Ti2,16,0)3+6+4+6+3+6+2+2+0
(Elsasser et al., 1997). EBS patterns of irinarassite are fit
to the garnet model with a = 12.50(3) Å, space group Ia3d, Z = 8.

JOTIEITE


KUDRYAVTSEVAITE

NEW MINERAL NAMES

MANGANOBLODITE*, COBALTOBLODITE*


Manganoblödite, Na$_3$Mn(SO$_4$)$_2$·4H$_2$O, and cobaltoblödite, Na$_3$Co(SO$_4$)$_2$·4H$_2$O: Two new members of the blödite group from the Blue Lizard mine, San Juan County, Utah, USA.


Manganoblödite (IMA 2012-029), ideally Na$_3$Mn(SO$_4$)$_2$·4H$_2$O, and cobaltoblödite (IMA 2012-059), ideally Na$_3$Co(SO$_4$)$_2$·4H$_2$O, were found at the Blue Lizard mine, San Juan County, Utah, U.S.A.

The new minerals occur as intimate intergrowths with Mn-Co-Ni-bearing blödite in direct association with chalcocite, gypsum, johannite, sideronatrite, quartz, and feldspar, with nearby minerals including atacamite, baryte, bornite, brochantite, chalcopyrite, copiapite, covellite, cyanorichte, ferrinitnite, talcrichtite, metavolinite, niatrozippeite, pseudojohannite, pyrite, römerite, rhomboclase, tamarugite, uraninite, and several new uranyl sulfates. The new minerals found in encrustations and efflorescences on the walls of abandoned underground mine and related to postmining (after 1978) oxidation of primary U ores hosted by sandstones and containing pyrite, chalcopyrite, bornite, and other sulfides. Both new minerals occur as aggregates of anhedral grains up to 60 µm (manganoblödite) and 200 µm (cobaltoblödite) in size forming thin crusts covering areas up to 2 × 2 cm on the surface of other sulfates. A second occurrence of manganoblödite was found among an assemblage of post-mine manganese sulfates forming encrustations on the wall of an adit of the abandoned Womobi mine, near Tholgorong, in northern Victoria, Australia. Manganoblödite and cobaltoblödite are transparent and colorless in single grains, reddish-pink in aggregates and crusts, have a white streak, vitreous luster, are brittle, have uneven fracture, show no obvious parting or cleavage. Mohs hardness is 2½. $D_{\text{meas}} = 2.25(2)$ and $D_{\text{calc}} = 2.338$ g/cm$^3$ for manganoblödite, and $D_{\text{meas}} = 2.29(2)$ and $D_{\text{calc}} = 2.347$ g/cm$^3$ for cobaltoblödite. The minerals are not fluorescent in ultraviolet radiation or in cathode rays. Both species are colorless in transmitted light and non-pleochroic, both are biaxial (+), with $\alpha = 1.493(2), \beta = 1.498(2), \gamma = 1.501(2)$, $2\theta_{\text{meas}} = 80(10)^\circ$, and $2\theta_{\text{calc}} = 75^\circ$ for manganoblödite, and $\alpha = 1.498(2), \beta = 1.503(2), \gamma = 1.505(2), 2\theta_{\text{meas}} = 70(10)^\circ$, and $2\theta_{\text{calc}} = 64^\circ$ for cobaltoblödite. Both minerals show weak dispersion, $r > v$. The main absorption bands of the IR spectrum of cobaltoblödite (cm$^{-1}$) are: 668 (antisymmetric bending of (SO$_4$)$_2^-$), 969, 1096, and 1187 [symmetric and antisymmetric stretching of (SO$_4$)$_2^-$], 1373 and 1463 (lower-frequency combinations of (SO$_4$)$_2^-$), 1618 and 1685 (H$_2$O bending), 3245, 3404, 3490, and 3556 (symmetric and antisymmetric stretching of H$_2$O). The average of 5 electron probe EDS analyses for manganoblödite gives [wt% (range)]: Na$_2$O 16.94 (16.04–17.40), MgO 3.29 (2.11–4.54), MnO 8.80 (7.93–10.18), CoO 2.96 (1.87–3.94), NiO 1.34 (0.81–1.83), SO$_4$ 45.39 (43.16–47.82), H$_2$O (calc. by stoichiometry) 20.14, total 98.86. The empirical formula based on 12 O apfu is Na$_{1.96}$(Mn$_{0.94}$Mg$_{0.06}$)$_{2}$Co$_{0.09}$Ni$_{0.05}$)$_{2}$O$_{16.94}$·4H$_2$O. The average of 5 electron probe EDS analyses for cobaltoblödite gives [wt% (range)]: Na$_2$O 17.00 (16.69–17.33), MgO 3.42 (3.30–3.80), MnO 3.38 (3.09–4.39), CoO 7.68 (7.19–8.12), NiO 2.53 (2.13–2.82), SO$_4$ 45.41 (44.85–51.21), H$_2$O (calc. by stoichiometry) 20.20, total 99.63. The empirical formula based on 12 O apfu is Na$_{1.96}$(Co$_{0.94}$Mg$_{0.06}$)$_{2}$O$_{16.94}$·4H$_2$O. The strongest lines in the X-ray powder-diffraction pattern [d Å (P%, hkl)] are: 4.556 (70; 210, 011), 4.266 (45; 201), 3.791 (26; 011), 3.338 (21; 310), 2.931 (100; 202, 012), 2.566 (67; 211, 212), 2.968 (22; 211), 2.647 (24; 301) for manganoblödite, and 4.551 (80; 210, 011), 4.469 (50; 201), 3.785 (18; 211), 3.339 (43; 310), 3.29 (100; 202, 012), 3.258 (58; 211, 212), 2.644 (21; 401), 2.296 (22; 102) for cobaltoblödite. The unit-cell parameters refined from powder-diffraction data are: $a = 11.131(3), b = 8.266(2), c = 5.540(1)$ Å, $\beta = 100.56(2)^\circ$, and $V = 501.0$ Å$^3$ for manganoblödite and $a = 11.140(3), b = 8.261(2), c = 5.544(1)$ Å, $\beta = 100.62(2)^\circ$, and $V = 500.3$ Å$^3$ for cobaltoblödite. Single-crystal X-ray diffraction data collected on manganoblödite crystal of size 60 × 50 × 30 µm [refined to $R = 0.0459$ for 1115 unique reflections with $I \geq 4\sigma(I)$] and on cobaltoblödite crystal of size 120 × 50 × 40 µm [refined to $R = 0.339$ for 1214 unique reflections with $I \geq 4\sigma(I)$] show that both minerals are monoclinic, space group $P2_1/a$, with $a = 11.137(2), b = 8.279(1), c = 5.5381(9)$ Å, $\beta = 100.42(1)^\circ$, $V = 502.20$ Å$^3$, and $Z = 2$ (manganoblödite), and $a = 11.147(1), b = 8.268(1), c = 5.5396(7)$ Å, $\beta = 100.517(11)^\circ$, $V = 501.97$ Å$^3$, and $Z = 2$ (cobaltoblödite). The new minerals are isostructural with other members of the blödite group, which consists of sheets of M$^{2+}$ and Na octahedra that are parallel to the a-b plane and interconnected by SO$_4$ tetrahedra. The names of the new minerals reflect their chemical composition and relationship to blödite, with which they form a solid solution. A cotype specimens of manganoblödite and cobaltoblödite are deposited in the collections of the Fersman Mineralogical Museum of the Russian Academy of Sciences, Moscow, and in the collections of Museum Victoria, Melbourne, Australia. O.C.G.

MINOLHITE*

Minohite (IMA 2012-035), ideally (Cu, Zn)_8(SO_4)_3(Fe, Mn, Ni)_2(OH))_6·8H_2O, was found in the oxidized zone of the Hiroto mine at Minoh (Minoo) City, Osaka Prefecture, Japan. The mineral occurs in cracks of altered shale as rosette aggregates up to 100 μm in diameter composed of hexagonal platy crystals up to 50 × 10 μm. The new mineral may have formed as a secondary mineral deposited from underground water containing Cu^{2+}, Zn^{2+}, and SO_4^{2-} ions derived from the dissolution of chalcopyrite and sphalerite. Minohite is found in association with chamosite, muscovite, smithsonite, serpentine, ramsbeckite, limonite, and chalcopyrite. The mineral is bluish-green with a pale green streak, is transparent with a pearly to vitreous luster, has brittle tenacity, perfect cleavage on {001}, and a Mohs hardness < 2. D_{meas} = 3.39 g/cm^3 (crystal could not perfectly be separated from smithsonite); D_{calc} = 3.28 g/cm^3. The mineral is easily soluble in dilute hydrochloric acid. It is not fluorescent under UV light, is optically anisotropic and moderate birefringent with no pleochroism (no other optical data provided). The main absorption bands of IR spectrum (cm\(^{-1}\), w = weak, s = strong) are: 3422s (O-H stretching vibrations), 1636w (O-H bending vibration), 1119s and 1031s (SO_4 stretching vibrations), 609s and 477s (SO_4 bending vibrations). The average of 5 electron probe WDS analyses gives [wt% (range)]: CuO 37.18 (34.39–41.46), ZnO 21.08 (17.38–25.11), FeO 0.49 (0.37–0.67), SO_4 16.78 (16.46–16.98), TiO_2 0.44 (0.20–0.86), and H_2O 24.03 (by difference), total 100.00. The empirical formula based on Cu + Zn + Fe + S + Si = 9 apfu is (Cu\(_{0.60(2)}\)Zn\(_{0.40(2)}\))\(_{Fe_{0.02(1)}Na_{0.02(1)}(SO_4)_{0.98(2)}(SiO_2)_{0.02(1)}(OH)_{0.01}(H_2O)_{7.81}}\)Al\(_{m}\)OH\(_{17.09}\). For titanoholtite and szklaryite (IMA 2012-070), the new members of the holtite supergroup, the empirical formula based on Cu + Zn + As + Sb + Fe + Nb + Ta + Al + Si = 10.68 apfu is [wt% (St.dev.)]: P\(_2\)O_5 2.45 (2.00), As\(_2\)O_3 2.07 (1.39), S\(_2\)O_3 4.43 (2.40), Nb 0.35 (0.20–0.86), and H_2O 7.33 (by difference), total 100.00. The empirical formula based on Cu + Zn + Fe + S + Si = 9 apfu is (Cu\(_{0.68(7)}\)Zn\(_{0.26(7)}\)Fe\(_{0.02(1)}\)Na\(_{0.01(1)}\)Fe\(_{0.01(1)}\)Ti\(_{0.01(1)}\)Nb\(_{0.44(0.20–0.86)}\)Ta\(_{0.18(0.20–0.86)}\)Al\(_{m}\)O\(_{10}\)Si\(_{9.64(2)}\)O\(_{3}\)O\(_{3}\)Si\(_{0.14(0.01–0.20)}\)O\(_{17}\)O_H\(_{17.07}\). The mineral is named titanoholtite and szklaryite. The mineral is composed of hexagonal platy crystals up to 50 μm. The new minerals of the dumortierite supergroup, nioboholtite, titanoholtite end-member formula (Ti\(_{0.92(0.05)}\)Ta\(_{0.08(0.05)}\)Al\(_{m}\)O\(_{10}\)Si\(_{9.64(2)}\)O\(_{3}\)O\(_{3}\)Si\(_{0.14(0.01–0.20)}\)O\(_{17}\)O_H\(_{17.07}\). For titanoholtite and szklaryite (IMA 2012-070), the first representatives of the dumortierite supergroup, nioboholtite, titanoholtite (IMA 2012-068, 069), the new members of the holtite supergroup (Pieczka et al. 2013) and calculated on the basis of O = 18–As–Sb are: [(Nb\(_{0.26(0.01)}\)Ta\(_{0.09(0.01)}\)Al\(_{0.65(0.01)}\)Fe\(_{0.06(0.01)}\)O\(_{16}\)]\(_{2.18(0.20)}\)Al\(_{m}\)Fe\(_{0.02(0.01)}\)Si\(_{0.02(0.01)}\)O\(_{17}\)O_H\(_{17.07}\)O\(_{17}\)O_H\(_{17.07}\). The new minerals of the dumortierite supergroup, nioboholtite, titanoholtite (IMA 2012-068, 069), the new members of the holtite supergroup (Pieczka et al. 2013) and calculated on the basis of O = 18–As–Sb are: [(Nb\(_{0.26(0.01)}\)Ta\(_{0.09(0.01)}\)Al\(_{0.65(0.01)}\)Fe\(_{0.06(0.01)}\)O\(_{16}\)]\(_{2.18(0.20)}\)Al\(_{m}\)Fe\(_{0.02(0.01)}\)Si\(_{0.02(0.01)}\)O\(_{17}\)O_H\(_{17.07}\)O\(_{17}\)O_H\(_{17.07}\). The new minerals of the dumortierite supergroup, nioboholtite, titanoholtite (IMA 2012-068, 069), the new members of the holtite supergroup (Pieczka et al. 2013) and calculated on the basis of O = 18–As–Sb are: [(Nb\(_{0.26(0.01)}\)Ta\(_{0.09(0.01)}\)Al\(_{0.65(0.01)}\)Fe\(_{0.06(0.01)}\)O\(_{16}\)]\(_{2.18(0.20)}\)Al\(_{m}\)Fe\(_{0.02(0.01)}\)Si\(_{0.02(0.01)}\)O\(_{17}\)O_H\(_{17.07}\)O\(_{17}\)O_H\(_{17.07}\).
Oxomagnesiostasinite

A.N. Zaitsev, E.Yu. Avdontseva, S.N. Britvin, A. Demény, Z. Ho-
nomay, T.E. Jeffries, J. Keller, V.G. Krivovichev, G. Markl,

Oxomagnesiostasinite (IMA 2011-035), ideally NaCa$_2$(Mg$_2$Fe$^{3+}$)$_2$(Al$_2$Si$_3$O$_8$)$_2$O$_2$, is a new anhydrous amphibole from the Deeti volcanic cone in the Gregory rift (northern Tanzania). The host rocks are melliteitic massive tuffs that contain a suite of centimeter-size megacrysts (diopside and plagiophyte in addition to amphibole) and xenoliths of amphibole-mica peridotites, pyroxenites, and jotolites. Oxomagnesiostasinite occurs as megacrysts up to 12 cm in size, rounded, do not show any crystal faces, and they are characterized by a smooth (“melted”) surface. Rarely, oxomagnesiostasinite crystals contain inclusions of euhedral diopside grains. The amphibole is brown with a white streak; small fragments are transparent and have a vitreous luster. Oxomagnesiostasinite is brittle, has a perfect {110} cleavage, and uneven fracture. The Mohs hardness is ~6. $D_{\text{max}}$ (hydrostatic weighing) is 3.19(2) g/cm$^3$ and $D_{\text{calc}}$ is 3.219 g/cm$^3$. Oxomagnesiostasinite is biaxial (−), $\alpha = 1.706(2)$, $\beta = 1.715(2)$, $\gamma = 1.720(2)$ (589 nm). $V_r = 73\%$. Dispersion: $r > v$, weak; $Y = b$; $Z \times c = 8\%$; pleochroism is strong, $Z =$ dark brown, $Y =$ brown, $X =$ light brown. The IR spectra of the oxomagnesiostasinite have sets of bands that are typical for amphiboles in the 300–1400 cm$^{-1}$ region: 460–508–634–681–737–940–975–1055 cm$^{-1}$, with very weak bands observed in the OH-stretching region between 3000 and 4000 cm$^{-1}$ with a maximum around 3632 cm$^{-1}$ and additional bands at 3652 and 3645 cm$^{-1}$. The average of 17 electron probe WDS analysis (wt%) is: SiO$_2$ 41.89, TiO$_2$ 3.96, Al$_2$O$_3$ 10.75, total FeO (from EMP analyses) 9.33, Fe$^{3+}$O $\Sigma 0.67$, and Fe$^{2+}$O $\Sigma 1.22$. Oxomagnesiostasinite is biaxial (−), $X = 1.706(2)$, $\beta = 1.715(2)$, $\gamma = 1.720(2)$ (589 nm). $V_r = 73\%$. 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