**Cayalsite-(Y)*


The new mineral cayalsite-(Y) (IMA 2011-094), ideally CaY6AlSi4O18F6 was found in cavities of Y-fluorite in two granitic NYF-pseudomagmites hosted by 1742 ± 46 Ma granitic gneiss in Tysfjord, Nordland, Norway: Stetind (68°10'15.20"N 16°33'10.65"E) and Øvre Lapplægeret (68°02’3.26”N 16°00’14.98”E). At both localities, cayalsite-(Y) occurs as a late-stage mineral forming colorless to faintly pink vitreous prismatic crystals up to 1.2 x 0.4 mm or radiating aggregates. Observed crystal forms are: prisms [011], [012], [110], [210], [011]; dipyramids [221], [312]; and pinacoids [100], [010], [001]. Closely associated minerals at both localities are bastnäsite-(Ce), hematite and yunstphaklite-(Y). Hundholmenite-(Y) and a montmorillonite-like mineral are found in Stetind. Cayalsite-(Y) has been found in two polytypes (1M and 1O). Both polytypes occur as intergrown crystals in Stetind while only the 1O-polytype has been clearly identified at Øvre Lapplægeret. Cayalsite-(Y) has a white streak, vitreous luster, and does not show any fluorescence. It is brittle with uneven fracture and no observed cleavage. The micro-indentation hardness of 1O polytype (the load weight not given) VHN = 1049 kg/mm2 (10390.7 MPa) corresponds to ~6/5 of Mohs scale. The density was not measured. The optical data was obtained only for cayalsite-(Y)-1O which is biaxial (+), α = 1.730(5), β = 1.740(5), γ = 1.760(5) (590 nm), 2V_eff = 56(5)°, 2V_nak = 71.2°; X = e, Y = b, Z = a. Dispersion is not reported. In the FTIR spectrum the region 2800–3800 cm^-1 is dominated by absorption bands assigned to Dy/f-f electronic transitions with the most intense signal at 3529 cm^-1. The OH-stretching bands normally located in this region are absent or masked. The possible minor OH-content is discussed based on crystal structure data. The exact maximax locations and assignment for the absorption bands in the regions ~1600–2000 and ~700–1400 cm^-1 on the provided IR spectrum are not given. The possible interplay of layer stacking and cation ordering is discussed. The crystal structure of cayalsite-(Y) is composed of three non-equivalent layers. Layer 1 contains parallel chains of edge sharing [AlO4] tetrahedra along [010]. The polar layer 2 is formed by isolated [SiO4] tetrahedra, F anions and REE cations and each [SiO3] layer 2 is formed by REE and Ca-cations in eightfold coordination of O and F. The layers are stacked in sequence 1 – 2 – 3 – 2′ – 1 – 3′ – 2 – 1... The polar layers 2 and 2′ are upside down to each other. The possible interplay of layer stacking and cation ordering is discussed. The name cayalsite-(Y) derives from the chemistry Ca(Y6). The new mineral cayalsite-(Y) has entries for nine new minerals, including cayalsite-(Y), engelhauptite, furlite, hydroniumpharmacalumite, mambertite, parádisasvárite, perettite-(Y), shuvalovite, and susenearginite.

**Engelhauptite**


A new copper vanadate engelhauptite (IMA 2013-009), ideally KCu6(V4O10)(OH)Cl, was discovered in the Late Pleistocene vol-

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*L* with even Z number have been detected. The empirical formulæ based on (O+F)=24 apfu are respectively: Ca1.00(Y4.93Nd0.02Gd0.04)2O3.V2O7.Dy3.34
Er3.25.Yb0.26.Al1.86Si4.03.F6.08O17.92 and Ca1.00(Y4.93Nd0.02Gd0.04)2O3.V2O7.Dy3.34
Er3.25.Yb0.26.Al1.86Si4.03.F6.08O17.92 with D_cr = 4.86 and 4.83 g/cm³. An explanation for the throughout low totals is not given. The strongest lines in the X-ray powder diffraction pattern obtained by Gandolfi-type measurements on mixed 1M/10O crystal [d Å (hkl, polytype)] are: 5.221 (43; 110, 1M), 5.133 (51; 001, 1M), 4.915 (53; 111, 1M), 3.873 (33; 211, 121, 1M), 3.562 (67; 013, 1M and 311, 1O), 3.002 (100; 313, 113, 1M and 312, 1O), 2.756 (41; 020, 1M and 113, 1O), 2.662 (41; 206, 1M). The calculated X-ray powder diffraction patterns for each polytype are provided, but their intensities do not perfectly match with experimental data. The crystal structure of two maximum degree of order (MDO) polytypes has been solved based on the single-crystal X-ray diffraction data. The orthorhombic MDO polytype 1O has unit-cell parameters a = 15.993(1), b = 5.5306(3), c = 9.6590(7) Å, V = 854.35 Ä³, space group Pbnm, and refined to R = 0.022 on the basis of 1486 unique I>3σ(I) reflections. The monoclinic MDO polytype 1M has: a = 11.0602(7), b = 5.5280(2), c = 16.0195(9) Å, β = 118.925(3)°, V = 857.26 Ä³, space group P2/c, and refined to R = 0.035 in a mixture with cayalsite-(Y)-1O on the basis of 2994 unique I>3σ(I) reflections. The crystal structure of cayalsite-(Y) is composed of three non-equivalent layers. Layer 1 contains parallel chains of edge sharing [AlO4] octahedra along [010]. The polar layer 2 is formed by isolated [SiO4] tetrahedra, F anions and REE cations and each [SiO4] unit in this layer can occur in two orientations, with the two Si positions placed 0.95 Å apart. Complete [SiO4] tetrahedra are achieved by bonding to corner oxygen atoms of the [AlO4] octahedra of layer 1. Layer 3 formed by REE and Ca-cations in eightfold coordination by O and F. The layers are stacked in sequence...
Engelhauptite is a new mineral from the Hagendorf-Süd pegmatite, Hagendorf, Oberpfalz, Bavaria, Germany (49°39′1″N 12°27′35″E). Flurlite occurs on green mitridate and is closely associated with plimerite. It is also associated with beraunite, schoonertie, parasholzite, robertsite, and occasionally with an altered phosphophyllite. Flurlite is a secondary phosphate mineral probably formed from the hydrothermal reaction of zinc-bearing fluids with primary Fe-Mn phosphate(s) (triphyllite or zwiesselite). It occurs as ultrathin (<1 μm) translucent platelets forming characteristic twisted accordion-like aggregates. Flurlite color varies from bright orange-red to a dark maroon-red. The luster is pearly, and the streak is buff. Crystals are brittle; parting is not observed and cleavage is excellent on {001}. Flurlite is optically biaxial (−) with α = 1.60(1), β = 1.65(1), γ = 1.68(1) (white light); 2V' not measured, 2V'calc = 74°. Pleochroism is weak, X = pale yellow, Y = pale orange, Z = orange brown. Hardness has not been reported. Dmax = 2.89 g/cm³ (heavy liquids) and Dcalc = 2.84 g/cm³. Average of 7 electron probe WDS analyses is [wt% (range)]: ZnO 25.40 (23.4–27.2), MnO 5.28 (4.26–7.23), MgO 0.52 (0.25–0.63), Fe₂O₃ 18.50 (15.8–24.0) [Fe₂O₃ 10.30 on the basis of 1 Fe⁺² pfu, FeO 7.40], PO₄ 27.20 (25.6–28.3), H₂O 23.10 (on the basis of 20 H pfu), total 99.20. The empirical formula, calculated on the basis of 3 ½ pfu is: (Zn₂Mn₂Fe³⁺Fe²⁺Mg)₃(PO₄)₃(OH)₂·9H₂O. The strongest X-ray powder diffraction lines [d Å (P%; hkl)] are: 12.900 (100; 001), 8.375 (10; 011), 6.072 (14; 010); 5.567 (8; 012), 4.297 (21; 003), 2.763 (35; 040). The monoclinic unit-cell parameters refined from the powder data are: a = 6.392(3), b = 11.047(2), c = 13.067(3) Å, α = 99.42(3)°, V = 910.3 Å³. X-ray single-crystal diffraction study showed that all tested crystal presented severe streaking parallel to c*. Refinement of data collected at the MX2 beamline at the Australian Synchrotron on a ultrathin crystal (20 × 20 × 3 μm) showing less severe streaking yielded R₁ = 0.057 for 935 unique F > 4σ(F) reflections. Flurlite is monoclinic, P2₁/m, with unit-cell parameters (at 100 K) of a = 6.3710(13), b = 11.020(2), c = 13.016(3) Å, α = 99.34(3)°, V = 901.7 Å³, Z = 2. Flurlite has a heteropolycrystal structure, with layers parallel to {001} and packed with water molecules between the layers. The slabs are built up by chains of Zn-centered edge sharing octahedra running parallel to {100} and by chains of Fe⁺²-centered octahedra sharing their apices along {100} with dimers of Zn-centered trigonal bipyramids sharing edge and with a PO₄ group. Both chains are linked along {010} sharing octahedra and PO₄ group apaxes. Further PO₄ groups and Mn-centered octahedra complete the slabs. The structure of flurlite is related to the structure of schoonertie, which has the same layer dimensions 6.4 × 11.1 Å, although a different symmetry (orthorhombic, Pnmb) and a different topology of the layers. The name flurlite honors Mathias von Flurl (1756–1823), the founder of mineralogy and geology studies in Bavaria and author of the first geological map of Bavaria. Type material is deposited in the Museum Victoria, Melbourne, Victoria, Australia, with registration numbers M53238. F.C.

**NEW MINERAL NAMES**

2012

**FLURLITE**


Flurlite (IMA 2012-050), ideally (H₂O)₆Al₄[OH(H₂O)₄][Al₂(OH)₄(SiO₄)₂]·4–5H₂O, is a new mineral discovered at the Maria Josefa gold mine, near the town of Rodalquilar, Andalusia region, Spain. It is a secondary alteration product of arsenic-bearing ore minerals in fractures of alunitized gold-bearing volcanic rocks. Other associated minerals are phosphacolomite, phosphacordierite, natriopharmacolomite, hydroxymonacolomite, natriopharmacolomite, jarosite,
schorodite, arseniosiderite, yukonite, chlorargyrite, miersite, lavendulan, and goethite. Hydroniumpharmacoalumite forms patches up to 1 mm of colorless to white, intergrown cubic crystals up to 0.1 mm on edge, but typically smaller. When in direct contact with natriopharmacoalumite crystals, hydroniumpharmacoalumite is always the younger generation. The mineral is transparent with a vitreous to adamantine luster and a white streak. It is brittle with an irregular fracture and no cleavage. The fluorescence was not observed. The Mohs hardness is ~2.5. Due to the paucity of pure material the density was not measured: \( D_{\text{calc}} = 2.486 \, \text{g/cm}^3 \). The mineral is isotropic with \( n = 1.55 \) (589 nm). No IR data given. The average of electron probe WDS analyses (number not given) is \([\text{wt\%} \text{ (range)}]: \text{Na} \, 0.43 \text{ (0.42–0.44)}, \text{K} \, 0.10 \text{ (0.09–0.11)}, \text{Al} \, 30.50 \text{ (30.09–30.81)}, \text{Fe} \, 0.36 \text{ (0.23–0.54)}, \text{As} \, 52.01 \text{ (51.71–52.26)}, \text{H}_2\text{O} \text{ (by difference)} 16.60, \text{total} 100.00. \text{The elements} \text{P}, \text{S}, \text{Ti}, \text{Cu}, \text{Ba}, \text{Ca}, \text{Fe}, \text{Mn}, \text{Zn}, \text{Sr}, \text{Si were below detection limits.}

The empirical formula based on 3 As apfu and \( \text{H}_3\text{O}^+\text{Na}^+\text{K}^+ = 1.00 \) is \([\text{H}_2\text{O})_{0.90}\text{Na}_{0.09}\text{K}_{0.01}\text{Bi}_{0.99}(\text{Mo}_{5+})_{1.00}\text{O}_{5.51}(\text{AsO}_4)_{3.09}\text{H}_2\text{O}\text{II} = 2.75\text{H}_2\text{O} \). The strongest lines in the X-ray powder diffraction pattern are \([d \, \AA, \% (\text{hkl})]: 7.727 \text{ (100; 100)}, 4.461 \text{ (10; 111)}, 3.863 \text{ (40; 200)}, 2.732 \text{ (12; 220)}, 1.932 \text{ (40; 400). Hydroniumpharmacoalumite is cubic, space group \( \text{P}4_3\text{m, with} \ a = 7.7269(2) \, \text{Å}, \ V = 461.33 \, \text{Å}^3, \ Z = 1. The crystal structure refined to \( R = 2.13\% \) for all 7706 observed reflections and is consistent with the general pharmacoalumide structure type, with hydronium (oxonium) as the dominant cation in cavities of strongly distorted Al octahedra and As tetrahedra and especially with the structure of the iron analogue pharmacoalumide. The name is in allusion to the cation dominance of hydronium and Al. The holotype specimen and the corresponding EMPA sample are deposited in the Mineralogical State Collection Munich, Germany. \text{D.B.}

**Mambertiite**


The new mineral mambertiite (IMA 2013-098), BiMo\textsubscript{5}O\textsubscript{14}OH, was identified in only two specimens in Su Seinargiu, Sarroch, Carbonia, Sardinia, Italy. It occurs along with ferrimolybdate, muscovite, sardignite, and wulfenite in small vugs in veins composed by quartz and molybdenite with minor bismuthinite and bismuth, hosted by leucogranite porphyry, embedded in low-metamorphic-grade shales of Ordovician-Silurian age. The location is unusually rich with Bi besides probably the mineral from Rudabánya, Hungary (Fehér et al. 2015) Parádsasvárite, a new member of the malachite-rosasite group from Parádsasvár, Mátra Mountains, Hungary. Mineralogy and Petrology, 109(4), 405–411.

The new Zn-dominant malachite-rosasite group species parádsasvárite (IMA 2012-077) with a general formula (Zn, Cu)_xZn(CO)_y(OH)_z was described from the Nagy-Lápaľafő area, Parádsasvár, Mátra Mountains, Hungary. The Zn-dominant mineral under the name zircosnoite was originally mentioned by Strunz (1959) from Tsumeb, Namibia, without description (only Zn/Cu ratio 58.6/51.9 was given). Since then zircosnoite was reported worldwide in at least 24 localities (http://www.mindat.org) while on the official IMA list of minerals it was and is still (http://nrmima.nrm.se/IMA_Master_List_2016-03.pdf) marked with status Q (questionable). Very few chemical analyses of zircosnoite with Zn > Cu were published (Pauliš et al. 2005), but no confirmation of Zn dominance in both Me sites of rosasite structure was provided besides probably the mineral from Rudabánya, Hungary (Fehér et al. 2008) with empirical formula (Zn\textsubscript{1.5}Cu\textsubscript{1.5}Fe\textsubscript{0.5})\textsubscript{2}(CO\textsubscript{2})\textsubscript{4}(OH)\textsubscript{12}. In Nagy-Lápaľafő area the new mineral occurs as an alteration product of sphalerite and chalcoprite in small cavities in a few decimeters thick calcite veins hosted by argillized and pyrritized anandesites. Veins contain fluorite, palygorskite, quartz, dolomite, anatase, and disseminated sulfides. The other secondary minerals in the order of its abundance decreasing are: smithsonite, hydrozincite, hemimorphite, aurichalcite, rosasite, malachite, chalcocite, azurite, cerussite, anglesite, deviline, and linemanite. Parádsasvárite forms pale beige, globular aggregates up to 0.2 mm on calcite. The globules consist of radial aggregates of bladed crystals up to 80 × 5 μm. Parádsasvárite is white, sometimes with a weak bluish tint, translucent with a weakly vitreous, dull or silky luster and a white streak. It does not show any fluorescence under UV light. Mohs hardness is ~2–3. The mineral is brittle with a finely fibrous fracture; cleavage or parting were not observed. Due to the scarcity of material the density was not measured; \( D_{\text{calc}} = 4.175 \, \text{g/cm}^3 \). Other mineral structures were not obtained besides the pleochroism (colorless to very pale green); \( n_{\text{e}} = 1.764 \). The FTIR spectrum was obtained for the regions 500–2000 and 2500–4000 cm\(^{-1}\) and it is similar to other members of the malachite-rosasite group with the main bands (cm\(^{-1}\))

- 661, 738, 792, and 1097 (bending modes of CO\textsubscript{2} groups), 993 (60H deformation mode), 1379, 1514 (CO\textsubscript{2} stretching), 3272, 3473 (OH stretching).
stretching). Observed bands at 1637 and weak 3647 are assigned to the H$_2$O absorbed on the mineral surface. The average of nine electron-probe WDS analyses [wt% (range)] is: ZnO 58.08 (55.00–63.08), CuO 12.60 (8.76–15.18), PbO 1.27 (0.55–1.65), CO$_2$ (by stoichiometry) 19.50, H$_2$O (by stoichiometry) 7.94, total 99.39, corresponding to the empirical formula \((\text{Zn}_{0.62}\text{Cu}_{0.36}\text{Pb}_{0.01})_{\text{CO}_3}\text{(OH)}\). The strongest lines in the X-ray powder diffraction pattern are \(d (\AA) (\text{PdF}) \pm \delta\): 6.054 (67; 200), 5.085 (100; 210), 3.703 (87; 310; 220), 3.021 (25; 400; 120), 2.971 (25; \(\delta\)11,001), 2.603 (62, \(\delta\)21), 2.539 (36; 420). X-ray powder data and unit-cell parameters of parásásvárite are very close to that of rosasite. The mineral is monoclinic, space group \(P2_1/a\), \(a = 12.92(1), b = 9.372(7), c = 3.159(4) \AA, \beta = 110.4(1)^\circ\), \(V = 358.5 \AA^3\), \(Z = 4\). The single-crystal X-ray study was not performed due to microcrystalline habit. X-ray powder pattern for parásásvárite calculated based on crystal structure of rosasite (Perchiazzi 2006) assuming \(Me1\) site occupied by 0.63Zn + 0.36Cu + 0.01Pb and \(Me2\) site occupied entirely by Zn is in a good agreement with an experimental data. Parásásvárite was named after the type locality Parádsasvár, in the Mátra Mountains of Hungary. The holotype specimen is deposited in the collection of the Hermann Ottó Museum, Miskolc, Hungary. D.B.

References cited

Perettiite-(Y), ideally \(Y^2\text{Mn}^2\text{Fe}^2\text{[Si}_2\text{B}_8\text{O}_{24}]\), a new mineral from Momeik, Myanmar. European Journal of Mineralogy, 27(6), 793–803.

The new mineral perettiite-(Y), (IMA 2014-109), ideally \(Y^2\text{Mn}^2\text{Fe}^2\text{[Si}_2\text{B}_8\text{O}_{24}]\) has been discovered in the region of Momeik, north of Mogok, Myanmar. It was found as inclusions in perfect gemmy colorless transparent phenakite crystals originated from isolated pegmatite pockets of granitic pegmatites intruding large peridotite body. Of the stock of ~10000 phenakite centimeter-sized crystals only 15 were containing inclusions of perettiite-(Y). Other inclusions in phenakite are schorl, tuseionite, columbite-(Mn), allibate, fluorapatite, and lazulite. Phenakite crystals found in pockets with quartz, feldspar, and schorl. Neighborhood pegmatites contain famous mushroom and botryoidal tourmalines, hammerbergite, petalite, beryl (aquamarine and morganite), pollucite, danburite, topaz, almandine-spsersartite, biotite, magnetite, lepidolite, phengite-ferberite, and cassiterite. Perettiite-(Y) forms yellow needles elongated by [010] up to a few cm. The crystal structure of perettiite-(Y) has two eightfold-coordinated sites: one dominated by Y and the other by \(\text{Mn}^2+\text{Fe}^2+\text{Fe}^3+\text{Al}^3\).

The new mineral shuvalovite (IMA 2014-057), ideally \(K_2\text{Ca}_2\text{Na}\text{(SO}_4\text{)}_3\text{F}\), a new mineral from the Tolbachik volcano, Kamchatka, Russia. European Journal of Mineralogy, 28(1), 53–62.
ite, kozyrevskite, popovite, alarsite, halite, Cu-gahnite, corundum, and fluorite are subordinate or rare. The new mineral was most likely formed through gas–rock interaction where basalt served as a source of metals. Shuvalovite forms coarse lamellar to tabular {100}, rectangular, octagonal or irregular crystals up to 0.05 × 0.7 × 0.9 mm combined in open-work aggregates or crusts up to 1 × 1 cm on basalt scoria. The latter overgrowing along with calciolanobenite and tenorite the surface of basalt scoria “sprinkled” with small crystals of hematite, orthoclase, and fluorophlogopite. It also occurs as imperfect, pillow-like individuals occasionally overgrown by tiny distorted cubo-octahedra of fluorite. Shuvalovite of the second generation forms long prismatic to acicular, typically divergent microcrystals up to 0.05 mm × 3 μm, and dendritic-like aggregates. It is brittle, with Mohs hardness ~3. Cleavage was not observed; the fracture is uneven. Attempts to measure the density failed due to the micro-cavernous character of the crystals; \( D_{\text{calc}} = 2.64 \text{ g/cm}^3 \). In plane-polarized light shuvalovite is colorless nonpleochroic. It is optically biaxial (−), \( \alpha = 1.493(1), \beta = 1.498(1), \gamma = 1.498(1) \) (589 nm) and 2\( V_{\text{meas}} \leq 20^\circ \); dispersion of the optical axes was not observed. The IR spectrum of shuvalovite is similar to that of the apatite-supergroup sulfate mineral cesanite, \( \text{Ca}_4\text{Na}_{1/4}\text{SO}_4(\text{OH})_4 \). The main bands are: (cm\(^{-1}\), s – strong band, w – weak band, sh – shoulder): 1165sh, 1125s [\( \nu(F_2) \) = asymmetric stretching of \( \text{SO}_4^2– \)], 993w [\( \nu(A_4) \) = symmetric stretching of \( \text{SO}_4^2– \)], 643, 627, 612 [\( \nu(F_2) \) = bending of \( \text{SO}_4^2– \)], 474w (overtone or librational vibrations of \( \text{SO}_4^2– \)). Characteristic bands of B-, C-, N-, and H-bearing groups are absent. The average of 22 electron probe WDS analyses [wt% (range)] is: Na\(_2\)O 7.37 (4.70–9.09), K\(_2\)O 19.33 (18.01–20.19), CaO 21.39 (20.26–23.21), SO\(_3\) 49.49 (47.90–50.98), F\(_2–\) 3.78 (3.41–4.33), \( –\text{O} = \text{F} \) 2 1.59, total 99.77. Contents of other elements with atomic numbers higher than carbon are below their detection limits. The empirical formula calculated on the basis of 13 (O+F) apfu is: \( \text{Na}_{1.16}\text{K}_{2.01}\text{Ca}_{1.86}\text{S}_{3.02}\text{O}_{12.03}\text{F}_{0.97} \). The strongest reflections of the powder X-ray diffraction pattern [\( d \) Å (%hkl)] are: 7.44 (27; 101), 7.22 (22; 200), 4.245 (45; 102, 121), 3.963 (62; 301), 3.281 (100; 122), 3.210 (30; 031), 3.144 (84; 302,321), 3.112 (67; 131,401), 3.016 (78; 222), 2.785 (52; 420). The orthorhombic unit-cell parameters refined from the powder data are: \( a = 13.248(3), b = 10.306(3), c = 8.989(3) \) Å, \( V = 1227.2 \) Å\(^3\). The crystal structure was solved by direct methods and/or librational vibrations of \( \text{SO}_4^2– \).\( K(1) \) and \( K(2) \) cations are ninefold coordinated. All Ca and K sites contain admixed Na, the majority of which is located in the Ca(2) site. The comparative crystal chemistry of structurally similar sulfates with the general formula \( M_4(\text{SO}_4)_3X \) (shuvalovite, krasheninnikovite, and apatite-type compounds) is discussed. Shuvalovite is named in honor of the Russian statesman Ivan Ivanovich Shuvalov (1727–1797), an enthusiastic patron of the sciences, arts and literature, one of the founders of the Moscow University in 1755. The holotype specimen is deposited in the Fersman Mineralogical Museum of the Russian Academy of Sciences, Moscow, Russia. D.B.

**Suseinargiuite**

P. Orlandi, C. Biagiioni, Y. Moëlo, J. Langlade, and E. Faulques (2015) Suseinargiuite, \((\text{Na}_0.5\text{Bi}_0.5)\text{MoO}_4\), the Na-Bi analogue of wulfenite, from Su Seinargiu, Sardinia, Italy. European Journal of Mineralogy, 27(5), 695–699.

The new mineral species suseinargiuite (IMA 2014-089), ideally \((\text{Na}_0.5\text{Bi}_0.5)\text{MoO}_4\), has been discovered in the Mo-Bi occurrence of Su Seinargiu, Sarroch, Cagliari, Sardinia, Italy. It occurs in small vugs in quartz-molybdenite veins among minerals formed by hydrothermal and/or supergene alteration of the primary Mo-Bi mineral assemblage (see mambertiite abstract above D.B.) and closely associated with wulfenite. Suseinargiuite forms hemispherical aggregates (up to 0.2–0.3 mm in diameter) of acicular crystals, up to a few micrometers long. It is colorless, transparent with a pearly to adamantine luster. The mineral is brittle. Hardness and density were not measured due to a small crystal size; \( D_{\text{calc}} = 5.597 \text{ g/cm}^3 \) (for an ideal formula). In transmitted light suseinargiuite is transparent, colorless. It has straight extinction and high birefringence. Other optical properties were not determined; \( n_{\text{calc}} = 2.11 \) (for an ideal formula). Micro-Raman spectra collected in the region 100–2000 cm\(^{-1}\) on the grain used for chemical tests show the following bands (cm\(^{-1}\)): 131, 188, 319, 376, 772, and 876; all corresponding to vibration modes of MoO\(_3^2–\) groups. The averages of electron probe WDS analyses for outer (12) / inner (14) zones [wt% / wt% (range)] are: MoO\(_3\) 49.03/45.59 (43.49–51.14), Bi\(_2\)O\(_3\) 42.97/34.47 (32.77–37.49), PbO 2.89/12.04 (1.36–13.82), Na\(_2\)O 3.69/3.03 (2.76–4.39), total 98.58/95.13. No other elements with \( Z > 9 \) were detected. The low totals are assigned to the porosity of micro-crystalline aggregates. The empirical formulas based on 4 O apfu for outer and inner zones respectively are: \((\text{Na}_0.5\text{Bi}_0.5\text{Pb}_{0.25}\text{Sr}_{0.25})\text{MoO}_4\text{F}_{0.09}\) and \((\text{Na}_{0.5}\text{Bi}_{0.5}\text{Pb}_{0.17})\text{MoO}_4\text{F}_{0.09}\). The strongest lines in the X-ray powder pattern are [\( d \) Å (%hkl)]: 3.146 (100; 112), 2.912 (13; 004), 2.652 (18; 200), 1.964 (34; 204), 1.875 (15; 220), 1.728 (19; 116), 1.616 (28; 312), 1.329. Tetragonal unit-cell parameters, refined from the powder X-ray diffraction data are \( a = 5.296(1), c = 11.673(2), V = 327.4 \) Å\(^3\), space group \( I4_1/a \), \( Z = 4 \). Due to the lack of suitable crystals, the crystal structure of suseinargiuite was not solved. X-ray powder diffraction data, micro-Raman spectra, and chemical analysis, show the close similarity of suseinargiuite to synthetic \((\text{Na}_0.5\text{Bi}_0.5)\text{MoO}_4\), which has a scheelite-type structure. Thus suseinargiuite is the Na-Bi analog of wulfenite. The presence of vacancies in synthetic \((\text{Na}_0.5\text{Bi}_0.5)\text{MoO}_4\) allow to suggest two possible substitution schemes: \( \text{Na}^+ + \text{Bi}^{3+} = 2\text{Pb}^2+, \) with a strong increase of the unit-cell volume or \( 3\text{Na}^+ = \text{Bi}^{3+} + 2\text{F}^– \). The formula of suseinargiuite could be written as \((\text{Na}_{1.5–x} \text{Bi}_{0.5+x/3} \text{Pb}_{2x/3} \text{Sr}_{y/3})\text{MoO}_4\). The outer and the inner zones of the analyzed grains correspond to \( x \approx 0.13, y \approx 0.02 \) and \( x \approx 0.10, y \approx 0.09 \), respectively. Suseinargiuite was named, for its type locality. The holotype specimen is deposited in the Museo di Storia Naturale, Università di Pisa, Pisa, Italy. D.B.