New Mineral Names*†

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This New Mineral Names has entries for 11 new minerals, including alfredopetrovite, bussyite-(Y), colinovensite, esquireite, ferromerrillite, fluorapatopyrochlore, fluor-schorl, hogarthite, shilovite, tapiolate, waimirite-(Y).

ALFREDOPETROVITE*

Alfredopetrovite, a new selenite mineral from the El Dragón mine, Bolivia. European Journal of Mineralogy, 28(2), 479–484.

Alfredopetrovite (IMA 2015-026), ideally Al4(Se 4 O 3 )6·6H2O, is a new selenite mineral from the El Dragón mine, Antonio Quijarro Province, Potosí Department, Bolivia. The mine exploited a telural deposit consisting of a single selenide vein hosted by sandstones and shales. The main primary mineral is a Co-rich kru’taite–penroseite. Clausthalite, petrovicite, watkinsonite, eldragόnite, and grundmannite were crystallized from later solutions. Alfredopetrovite is a secondary mineral and occurs in vugs in a kru’taite-penroseite-dolomite-goethite matrix. Other main primary mineral is a Co-rich kru’taite–penroseite. Clausthalite, petrovicite, watkinsonite, eldragόnite, and grundmannite were crystalized from later solutions. Alfredopetrovite is a secondary mineral and

Bussyite-(Y)*


Bussyite-(Y) (IMA 2014-060), (Y,REE,Ca)4(Na,Ca)MnSiO 3 (OH,F) is a new mineral species from the Poudrette quarry (level 7), Mont Saint-Hilaire, Quebec, Canada. It occurs in a small alkaline pegmatite as embedded dark brown prismatic crystals inside massive white analagite. It differs from associated aegerine prisms by rectangular cross sections. Other associated minerals include microcline, sérandite, calcite, cappelinite-(Y), catapleiite, charmarite-2H and -3F, fluorite, helvite, kuppelkite, perraultite, and tainiolite. The bussyite-(Y) crystals are prismatic to bladed, blocky, sometimes radiating, and reach up to 3 mm. The mineral is transparent to translucent, with a white streak and vitreous luster. It is brittle with a perfect 10 cleavage and splintery fracture. Mohs hardness is 4–5. The density was not measured due to the small grain size; D calc = 3.11 g/cm 3 . Bussyite-(Y) is non-pleochroic, optically biaxial (–) with X = 1.583(2), Y = 1.593(2), Z = 1.600(2), 2V meas = 68°(2°), 2V calc = 79°; Z ε = 33° (β obtuse), Y = b, and X = [101]. Dispersion was not observed. Fine lamellar twinning, parallel to the elongation, was noted in some crystals. On the IR spectrum of bussyite-(Y) a low broad peak at 3500–2500 cm –1 and 4 minor peaks in the 2500–2000 cm –1 range are assigned to OH stretching vibrations. The large broad peak centered at 967 cm –1 is assigned to the [SiO 4 ] tetrahedron and OH vibrations. The large peak centered at 967 cm –1 is assigned to [SiO 4 ] and [BeO 4 ] bending modes with shoulders at 1003 and 1036 cm –1 likely due to the shorter bonds between Be and Si and OH and F. The moderate sharp peaks at 859, 705, and 647 cm –1 are assigned to the [SiO 4 ] and [BeO 4 ] bending modes. The average of 3 electron probe WDS analysis [wt% (ranges)] is: Na 2 O 8.21 (8.07–8.43), K 2 O 0.08 (0.50–0.10), BeO 0.75 (by structure refinement), CaO 5.25 (5.16–5.36), MnO 2.93 (5.27–3.20), BaO 0.03 (0.06), FeO 0.40 (0.25–0.60), Al 2 O 3 0.29 (0.21–0.34), Y 2 O 3 7.58 (7.37–7.97), La 2 O 3 0.48 (0.40–0.60), Ce 2 O 3 2.66 (2.37–3.09), Pr 2 O 3 0.48 (0.40–0.60).
Mohs hardness is ~4. The density by micropycnometry is 4.20(5); radiation. The mineral is brittle, with uneven fracture, and the estimated intensity, 0 = 1.735(20) (420 nm) and ε = 1.730(20) (650 nm). It is very strongly pleochroic from purple along the ε axis to blue in a perpendicular direction. The average of electron probe WDS analysis of 5 fragments (4 spots each) [w/o range] is: CuO 22.53 (22.09–22.98), BaO 43.43 (42.58–44.29), SiO3 34.04 (33.71–34.37), total 100.00. No other elements detectable by electron probe were found. The empirical formula based on 6 O apfu is Ba6Cu5Si3O13OH. No IR data was obtained. The strongest lines of the powder X-ray diffraction pattern [d Å (PbFCl)] are: 5.757 (31; 004), 4.997 (30; 020), 4.560 (31; 022), 3.533 (70; 220), 2.985 (100; 224), 2.499 (57; 040), 2.280 (23; 044), 1.767 (19; 440). The parameters of the tetragonal unit cell refined from the powder data are: a = 9.9762(4), b = 22.3200(9) Å, c = 2214.4 Å. The single crystal unit-cell parameters are: a = 9.9671(1), c = 22.290(2) Å, V = 2214.4 Å3, Z = 16, space group I4/acd. The crystal structure solved and refined to R1 = 0.021 based on 1379 unique F, >4σ(F) reflections. Colinoewosite is a cyclosilicate with a 4-membered single rings [SiO4]4−, arranged in sheets parallel to (001). CuO squares sharing corners with four neighboring silicate rings within a sheet. Ba2+ cations are bonded to 1 O atoms in irregular coordination. Colinoewosite is the natural analog of the well-studied synthetic pigment referred to as Chinese or Han purple, which is found on artifacts from ancient and imperial China. The mineral was named for the mineral collector and finder of the new species, Colin R. Owens (b. 1937), of Somerset West, South Africa. Type material is deposited in the collection of the Institut für Mineralogie und Kristallographie, University of Vienna, Austria. The X-ray structure refinement of single crystals taken from the newly collected wesselsite is also provided in the paper. Wesselsite belongs to the gillespite type of compounds with general formula AβSiO4 (A = Ca, Sr, Ba; B = Cr, Fe, Cu). The crystal structure is characterized by 4-membered rings of SiO4 tetrahedra, [SiO4]4−, which are connected into infinite sheets parallel to (001). Cu atoms in nearly planar square coordination are attached on both sides of the sheets. Adjacent layers are linked together by the Sr atoms in distorted square-antiprismatic coordination. Based on microprobe and refined site occupancy data, the composition of studied wesselsite is close to Sr1.00Ba0.1CuSiO4. The parameters of the tetragonal unit-cell are: a = 7.374(1), c = 15.636(2) Å, V = 850.2 Å3, space group P4/ncc, Z = 4. The complete solid solution has been observed for the synthetic compounds and in wide range between natural wesselsite and effenbergerite. Contrary to this, no significant Ba-Sr substitution was found in colinoewosite and scottsite and no isotopic strontium copper silicates are known. D.B.

**Colinoewosite**


Colinoewosite (IMA 2012-060), ideally BaCuSi3O8, is a new mineral species from the central-eastern ore body of the Wessels mine, Kalahari Manganese Field, Northern Cape Province, South Africa. It was found in 2 specimens which both contain a subset of typical paragenesis of Ba-, Sr-, and Cu-bearing silicates effenbergerite-wesselsite, lavinskyite, scottsite, and diegogattita, in close association with pectolite, quartz, aegirine, and richterite, minerals of the gamut group and a number of manganese and iron oxides with a dominance of hausmannite and hematite. Sugilite, which is generally found in the same paragenesis, is almost completely absent on these specimens. Colinoewosite forms purple to dark blue (when thicker) vitreous subhedral crystals up to 100 × 100 × 50 μm with a purple streak. The crystal forms [100] and [110] are observed while [001] is always present as a cleavage plane. No fluorescence is observed under UV radiation. The mineral is brittle, with uneven fracture, and the estimated Mohs hardness is ~4. The density by micropycnometry is 4.20(5); Dcalc = 4.236 g/cm3. Colinoewosite is not soluble in acids except HF. It shows very intense absorption in the range 450–620 nm, rendering the mineral almost opaque. Optical measurements in this range lack any confidence. They are feasible below and above this range, albeit with a relatively large estimated error. Colinoewosite is uniaxial (−), with ω = 1.740(20), ε = 1.735(20) (420 nm) and ω = 1.745(20), ε = 1.730(20) (650 nm). It is very strongly pleochroic from purple along the ε axis to blue in a perpendicular direction.

The new mineral esquireite (IMA 2014-066), ideally BaSi2O5, was found at the Esquire #1 claim along Rush Creek, eastern Fresno County, California, U.S.A. (36°58′25″N 119°15′01″W), and in Ba-silicate lens on the NW slope of Trumbull Peak, Mariposa County, California, U.S.A. (37°41′31″N 119°51′51″W). This is the 18th new species to be described from these localities. Esquireite forms as the result of contact metamorphism of Ba-rich sediments on sanbornite cleavage surfaces and along fractures transverse to cleavages. It is also often found in intimate association with or embedded in white, massive wetherite and/or opal. All three minerals appear to be low-temperature hydrothermal alteration products of sanbornite, withopal postdating esquireite. At the Esquire #1 claim esquireite is also associated with cerchiaraite-(Al), kampfite, macdonaldite, pyrrhotite, quartz, titanataramellite, and traskite. At Trumbull Peak, it is also associated with fencoperite, gilspite, macdonaldite,
quartz, and titanotaramellite. Esquireite occurs as colorless transparent rectangular blades, elongated and striated parallel to (010) and flattened on [011]. Twinning is common on [011]. The streak is white, the luster is vitreous to pearly. The mineral shows no fluorescence under UV radiation. It is brittle with irregular fracture and Mohs hardness is ~2. Two cleavages are observed: perfect on [010] and fair on [100]. The density (by flotation in an aqueous solution of sodium polytungstate) is \( \rho_{\text{calc}} = 2.18(2) \text{g/cm}^3, \rho_{\text{meas}} = 2.37(2) \text{g/cm}^3 \). The mineral is insoluble and unreactive in concentrated HCl, H_2SO_4, HNO_3, and NaOH. Esquireite is optically biaxial (+), with \( \alpha = 1.477, \beta = 1.481, \gamma = 1.492 \) (white light), 2V\(_{\text{meas}}\) = 63.8(6); \( V = b, Z = c = 22° \). No dispersion or pleochroism was observed. The average of the WDS electron probe analyses (with 6% for 4 points from Esquire #1 claim samples and 2 from Trumbull Peak crystals) along with the ranges (in parentheses) are: BaO 22.97, SiO_2 62.88–64.53, H_2O (based upon the crystal structure) 22.41, total 111.66 (due to dehydration under vacuum). The data normalized to a total of 100% are BaO 22.97, SiO_2 56.96, H_2O 20.07. The empirical formula (based on 20 O apfu) is Ba_{28.5}Si_{69.0}O_{131.3}H_{14.5}. The strongest lines in the X-ray powder diffraction pattern obtained in powdered sample by Gandolﬁ-type motion \([d \AA (\%); hkl)]:\ 7.02 (38); 002, 5.11 (33); 201, 4.649 (66); 003, 303, 4.191 (100); 111, 3.339 (65); 020, 311, 3.271 (92); 205, 314, 3.243 (33; multiple), and 2.261(35; multiple). The unit-cell parameters refined from X-ray powder diffraction pattern are \( a = 13.552(6), b = 4.909(6), c = 15.091(6) \), \( \beta = 115.00(1)^\circ \), and \( V = 934.1^3 \). A crystal of 80 × 50 × 10 μm from the Trumbull Peak specimen was used for the collection of structure data. The structure, solved by direct methods, reﬁned to \( R = 0.108 \) on the basis of 323 unique \( F > 4σ(F) \) reflections, with \( \alpha = 13.601(4), b = 4.9222(10), c = 16.092(5) \), \( \beta = 111.578(19)^\circ \), \( V = 939.6^3 \), space group \( C2, Z = 2 \). The crystal structure of esquireite contains four-tetrahedra-silicate layers parallel to \{001\} with Ba(HFO)\_7, a new mineral from the Martian meteorites, and some fluorine changes status of this mineral from Shergotty and Los Angeles, respectively (wavelength not reported). The density of the mineral from Shergotty could not be measured due to the scarcity of the mineral; \( \rho_{\text{calc}} = 3.11 \text{g/cm}^3 \). The density of the mineral from Los Angeles is \( \rho_{\text{calc}} = 3.14 \text{g/cm}^3 \) (sink–float method) \( \rho_{\text{meas}} = 3.17 \text{g/cm}^3 \). The average of 8 (Shergotty sample) and 10 (Los Angeles sample) electron probe EDS analyses (ranges not reported) [wt\%: Shergotty (Los Angeles)] is: Na_0 O_1.7/1.4, CaO 46.8/47.0, MgO 1.5/0.9, FeO 3.5/5.2, P_2O_5 46.2/45.7, total 99.7/100.2. The empirical formula, based on 28 O apfu, is Ca_{10}O_{28}(Na_{10.5}Ca_{9.5})_{13}(Fe_{14}V_{14})Mg_{10}Fe_{10}P_{14}O_{46}, (Shergotty) and Ca_{10}O_{28}(Na_{10}Ca_{9}Fe_{14})_{13}(Fe_{14}V_{14})Mg_{10}Fe_{10}P_{14}O_{46}, (Los Angeles). The strongest lines of the calculated powder X-ray diffraction pattern \([d \AA (\%); hkl)]:\ Shergotty (d/Å (\%); hkl)(Los Angeles) are: 6.46 (33); 104/6.42 (20); 104, 5.196 (20); 110/5.24 (10); 110, 3.423 (20); 1.10/3.43 (10); 1.10, 3.191 (81); 214/3.19 (60); 214, 2.861 (100); 2.010/2.86 (100); 2.010, 2.741 (21); 214/2.747 (20); 214, 2.594 (73); 220/2.594 (50); 220, 1.710 (21); 2.020/1.713 (20). The trigonal unit-cell parameters refined from the powder data are (for Shergotty and Los Angeles, respectively): \( a = 10.370(9) \) and 10.379(2) Å; \( c = 37.17(9) \) and 37.06(2) Å, \( V = 3462 \). A single-crystal X-ray study shows ferromerrillite is trigonal, \( R3c \), \( a = 10.372(2), c = 37.217(13) \), \( V = 3467 \). A crystal of 0.02 × 0.02 × 0.03 mm of ferromerrillite from Los Angeles sample was used for crystal structure determination. The crystal showed extremely high angular mosaicity owing to impact shock experienced by the host meteorite, a phenomenon, which is inherently typical for impact shocked crystals from shergottite meteorites. Data has been refined to \( R = 0.066 \) on the basis of 1420 unique \( F > 4σ(F) \) reflections. Ferromerrillite is isostructural with merrillite and is named as the Fe\(^{2+}\)-dominant analog of merrillite. The holotype specimen of ferromerrillite from Shergotty is deposited in the Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow. **FC.**

**Comment:** No direct determination of Fe\(^{3+}\) content has been provided by the authors in their description. The authors discuss the iron oxidation state on the basis of statistical analysis of correlation of lattice parameters and composition of M sites of known whitlockite-type compounds with available chemical analyses of merrillite samples and of the calculated bond valence values obtained from refined structure data. They conclude that all iron is divalent in the studies samples of ferromerrillite. However, the authors report Fe\(^{3+}\) in the formulas reported at Tables 2 and 3. These are probably an uncorrected error left from a previous version of the draft manuscript and these Fe\(^{3+}\) should not be taken into account mentioned in future work. Oxidation state in martian minerals is a debated item and therefore particular attention should be paid to avoid propagation of erroneous data unsupported by strong evidences.

**References cited**

**Fluornatroprychochlorite**

The description of fluornatroprychochlorite (IMA 2013-056), with a general formulae (Na,Ph,Co,REE, U)_2Nb_5O_{14}F changes status of this mineral from possible new species (Christy and Atencio 2013) to an officially approved species according current nomenclature of the pyrochlore supergroup (Atencio et al. 2010). The mineral was found in the alkali granite intruded into Silurian marble at the Boizhguore REE deposit, Baicheng County, Akesu, Xinjiang Autonomous Region, China (42°13′14″N; 81°54′29″E). It is closely associated with microcline, albite, aegirine, sodic amphibole, biotite, zincite, rutile, thorite, fluorite, fluorocite-(Ce), columbite-(Fe), xenotime-(Y), astrophyllite, chevkinite-(Ce), and fergusonite-(Y). Fluornatroprychochlorite forms translucent to transparent brownish yellow to red-
dish orange, anhedral, rarely subhedral grains from 0.02 to 0.25 mm with an adamantine luster and light yellow streak. The mineral does not fluoresce in UV light. No cleavage or parting was observed. It is brittle with Mohs hardness 4–4.5. The density was not measured; D_{calc} = 3.75 g/cm³. Fluor-natropyrochlore is optically isotropic, α = 2.01(5) (599.9 nm). FTIR spectrum show the absence of bands of OH or H₂O groups with only single peak at 931 cm⁻¹. The average of 10 electron probe WDS analysis on 2 grains [wt%, (range)] is: Na₂O 6.80 (3.33–9.30), K₂O 0.01 (0–0.04), CaO 2.01 (1.69–2.22), MgO 0.01 (0–0.05), FeO 0.05 (0–0.15), SrO 0.03 (0–0.11), PbO 16.17 (14.75–17.87), CeO₂ 4.29 (3.76–5.41), La₂O₃ 1.65 (1.37–1.93), Nd₂O₃ 0.41 (0–0.62), Y₂O₃ 0.42 (0.17–0.67), SiO₂ 0.03 (0–0.09), TiO₂ 1.36 (0.72–1.91), UO₂ 5.81 (4.21–7.36), Ta₂O₅ 3.00 (1.33–4.00), Nb₂O₅ 53.42 (51.71–56.16), F 3.19 (2.33–4.12), Cl 0.02 (0–0.06), ThO₂ 0.48 (0.13–1.41), SrO 0.01 (0–0.07), ZrO₂ 0.01 (0–0.13), MnO 0.04 (0–0.11), SnO₂ 0.34 (0.23–0.41), –O=(F,Cl) total 98.21, Ba, Al, and P were found below detection limit of 0.01 wt%.

Fluor-schorl is closely associated with quartz, biotite, albite, orthoclase, in high-temperature hydrothermal veins in granitic pegmatites (Grasstein). Fluor-schorl is uniaxial negative, ω = 1.660(2)–1.661(2), ε = 1.636(2)–1.637(2). Optical absorption spectrum shows a pair of absorption bands in the E₁g direction centered at 732 and 1140 nm (Fe²⁺ absorptions with intensity enhanced in the E₂g direction by interaction with Fe⁴⁺). In Raman spectra fluor-schorl and schorl are differentiated in the high-energy spectral range, where fluor-schorl is characterized by generally lower intensity of the O-H stretching band at 3563 cm⁻¹. The average of 20 (Zschorlau) and 8 (Grasstein) electron probe WDS and SIMS analyses is [wt% (standard deviation; no range provided)] Zschorlau/Grasstein: Li₂O 0.04 (n.d.) (by SIMS), Na₂O 2.44 (6.2)/3.54(6), K₂O 0.05 (1)/0.04(1), CaO 0.06 (1)/0.02(1), MgO 0.89(4)/0.07(1), ZnO 0.09(5)/0.12(1), MnO 0.10(4)/0.09(3), FeO₆ 16.49(25)/15.84(22), FeO₅ 15.83/13.15, Fe₂O₃ 0.73/2.99, Al₂O₃ 31.09/22/31.76/23, B₂O₃ (by SIMS) 9.86/n.d., B₂O₅ 10.00/10.12, TiO₂ 0.73(2)/0.17(2), SiO₂ 33.44(19)/34.38(12), F 1.20(5)/1.40(5), H₂O (by SIMS) 2.70/n.d., H₂O₆ 2.88/2.83, –O–Fe₃⁺ 0.51–0.59, total 99.06/99.70. The empirical formula based on 3 (OH,Fe,H) pfu are (Na₂O₆×PbO₂×CaO₃×CuO₃×Li₂O×Al₂O₃×Fe₂O₃×MgO×H₂O).The strongest lines in the powder XRD pattern are [d Å (I; hkl)] = 6.074 (3; 111), 3.042 (100; 222), 2.628 (38; 004), 1.932 (16; 400). Crystal from Grasstein to the tourmaline supergroup classification (Henry et al. 2010). Parts of the cotype material of fluor-schorl from Zschorlau (Mineralogische Sammlung, MIN 9777). Parts of the cotype material of fluor-schorl from Zschorlau (Mineralogische Sammlung, MIN 9777). Parts of the cotype material of fluor-schorl from Zschorlau (Mineralogische Sammlung, MIN 9777). Parts of the cotype material of fluor-schorl from Zschorlau (Mineralogische Sammlung, MIN 9777) were studied and chemical and structural data revealed several correlations.

References cited


Fluor-schorl


References cited


Hogarthite

NEW MINERAL NAMES

SHILOVITE*


Shilovite (2014-016), ideally Cu(NH$_3$)$_4$(NO$_3$)$_2$, is a new mineral found at the Pabellón de Pica Mountain, near Chanabayu, Iquique Province, Tarapacá Region, Chile. Associated minerals include halite, ammineite, atacamite, and thénardite. The host rock is a gabbro that consists of amphibole, plagioclase, and minor clinohore, and contains accessory chloropikrite that is considered the source of Cu for shilovite. Shilovite forms imperfect, thick tabular to equant crystals up to 0.15 mm in size included in massive halite. The new mineral is deep violet blue with a violet blue streak that changes to light blue as a result of decomposition and loss of NH$_3$. Crystals of shilovite are translucent with a vitreous luster, are scaly and show no cleavage. Density was not measured due to the small grain size of crystals and the instability of the mineral in available heavy liquids. $D_{\text{calc}} = 1.92 \, \text{g/cm}^3$. Mohs hardness is ≤ 2. Shilovite is optically biaxial (+), $\alpha = 1.527(2)$, $\beta = 1.545(5)$, $\gamma = 1.610(2)$, 2$V^\prime = 40–50^\circ$, but could not be determined accurately because the mineral decomposes rapidly in immersion liquids. 2$V^\prime = 57^\circ$. Shilovite is non-fluorescent. The main absorption bands of the IR spectrum (cm$^{-1}$, w = weak, s = strong) are: 3200–3700 (N-H stretching vibrations), 1700–3000 (overtones and combination modes involving N-O stretching and H-N-H bending), 1650 (degenerate bending vibrations of NO$_3$ molecules), 1361 and 1431 (asymmetric stretching vibrations of NO$_3$ anions), 900–1200s (bending modes of NO$_3$ molecules), 882 and 732 (out-of-plane and in-plane bending vibrations of NO$_3$ anions), respectively, bands below 700 (rocking and translational modes of NO$_3$ molecules).

The average of 3 electron probe EDS analyses [wt% (range)] is: Cu 26.04 (24.67–27.09), Fe 0.31 (0.22–0.48), Na 30.80 (29.77–32.39), O 35.95 (34.28–37.77). H (calculated from an ideal formula) 4.74, total V$\Sigma$ = 105.2. The strongest lines of the X-ray powder diffraction pattern [d (Å, hkl)] are: 5.931 (41; 400), 5.841 (100; 011), 5.208 (47; 410), 3.514 (80; 221), 3.426 (55; 310), 3.269 (65; 222). The crystal structure was solved by direct methods and refined to $R = 0.049$ on the basis of 1335 unique $F^2 > 4\sigma (F^2)$ reflections. Shilovite is monoclinic, space group C2/m, with single-crystal unit-cell parameters $a = 10.1839(5)$, $b = 15.8244(6)$, $c = 9.1327(7)$, $\beta = 104.463(2)$, $V = 1425.1 \, \text{Å}^3$, $Z = 2$. The structure of shilovite consists of a silicate component, composed of interconnected, non-planar 10-membered rings, arranged into thick slabs and stacked on [010], which are partially filled by Na, Ca, K, and H$_2$O. Shilovite belongs to the lemonyte group. The mineral is named for Donald H. Hogarth (b. 1929), Professor Emeritus in the Department of Earth Sciences at the University of Ottawa, in recognition of his contributions to the mineralogy and geology of the Grenville Province in Quebec and Ontario, and to the nomenclature of the pyrochlore group. The holotype specimen of shilovite is housed in the collection of the Canadian Museum of Nature (Gatineau, Canada), catalogue number CMNMC 86086. E.C.
Waimirite-(Y)*


Waimirite-(Y) (IMA 2013-108), orthorhombic YF$_3$, is a new mineral found at the A-type Madera granite (~1820 Ma), at the Pitinga mine, Presidente Figueiredo Co., Amazonas State, Brazil, as well as at Jabal Tawlah (Mount Tawlah) in the Kingdom of Saudi Arabia. At the Pitinga mine, the mineral occurs in hydrothermal veins (up to 30 mm thick) cross-cutting the albite-enriched facies associated with hollaysite. Minerals in the granite are K-feldspar, albite, quartz, riebeckite, biotite, muscovite, cryolite, zircon, polyhilionith, cassiterite, pyrochlore-group minerals, columbite, thortveit, native lead, hematite, galena, fluorite, xenotime-(Y), garnetite-(Y), fluorotrichite-(Ce), genthiewite-belvite, topaz, ilimaite, and chlorite. At Jabal Tawlah, waimirite-(Y) occurs in hydrothermally altered quartz-rich microgranite, also as the main REE mineral. Associated minerals include biotite, albite, muscovite, microcline, columbite-(Fe), zircon, thortveit, xenotime-(Y), samarskite-(Y), ilmenite, an undetermined Ca-Y mineral, euxenite-(Y), fergusonite-(Y), rutile, ilite, barite, calcite, and goethite. Waimirite-(Y) formed from fluorine-rich hydrothermal fluids containing large amounts of REE. Waimirite-(Y) from Brazil occurs as aggregates of platy crystals up to ~1 μm. Forms observed (determined on synthetic YF$_3$ only) are pinacoids, prisms, and bipyramids. Crystals are pink with white streak, are transparent to translucent with non-metallic luster, show no cleavage (synthetic YF$_3$ shows perfect cleavage on [1010] or parting. The Moiré hardness and density was not measured due to the small crystal size; D$_{calc} =$ 5.586 g/cm$^3$. Waimirite-(Y) is biaxial, mean n = 1.54–1.56. It is non-fluorescent under UV radiation. Waimirite-(Y) from Saudi Arabia occurs as inclusions in an undetermined Ca-Y mineral where anhedral-to-subhedral crystals of several tens to several hundreds of micrometers in size are common. The mineral is colorless with white streak, is transparent with vitreous luster, shows no cleavage, has irregular to conchoidal fracture and is brittle. The density was not measured because of small grain size; D$_{calc} =$ 5.678 g/cm$^3$. The indentation hardness VHN$_{1000} =$ 700 (667–766) kg/mm$^2$ corresponding to 5–6 of the Mohs scale. It is optically biaxial (+) with 2V$^\prime =$ 70–80° and mean refractive index n$^\prime = $ 1.60. At the IR spectrum of the material from Brazil polluted with a halloysite a strong band at 380 cm$^{-1}$ (with shoulders at 400 and 440 cm$^{-1}$) belongs to waimirite-(Y). IR spectrum demonstrates the absence of carbonate and borate groups. The average of 24 electron probe WDS analyses on the sample from Brazil [wt% (range)] is: F 29.27 (28.43–30.19), Y 37.25 (34.78–38.89), La 0.19 (0.01–0.28), Ce 0.30 (0.19–0.46), Pr 0.15 (0.03–0.25), Nd 0.65 (0.57–0.81), Sm 0.74 (0.66–0.87), Gd 1.86 (1.65–2.09), Tb 0.78 (0.60–0.95), Dy 8.06 (7.36–8.61), Ho 1.85 (1.47–2.35), Er 6.38 (5.80–7.24), Tm 1.00 (0.69–1.34), Yb 5.52 (4.99–6.16), Lu 0.65 (0.38–1.58), Ca 0.83 (0.71–0.97), O 2.05 (calculated by charge balance), total 97.53. This gives the empirical formula (Y$^{3+}$O$_2$)$_{13.88}$[(F$_{1.00}$O$_{0.03}$)(OH)$_{0.24}$]$^{2+}$[As$_{1.00}$O$_{3.88}$]$^{2+}$[(Si$_{3.21}$Al$_{0.79}$)O$_{11.00}$]$^{2+}$[(H$_2$O)$_{5.767(5)}$]$^{2+}$H$_2$O based on 32 O apfu. The strongest lines in the X-ray powder-diffraction pattern [d Å (hkl)] are: 13.91 (100 001), 7.23 (1 10 002), 5.39 (2 21 110), 4.64 (3 3 1 2 1 1 1), 3.952 (4 2 1 3 1 1 2 1), 3.290 (2 3 1 4 1 2 1 4 1 1 1), 2.823 (3 9 3 0 1 3 5 1 7), 2.753 (2 1 5 3 1 5 1 2 1 5 1). The unit-cell parametersefined from powder-diffraction data are: $a =$ 16.008(8), $b =$ 5.767(9), $c =$ 16.367(8) Å, $\beta =$ 116.722°, and $V =$ 1350 Å$^3$. Single-crystal X-ray diffraction data collected on a crystal of size 70 × 30 × 10 μm refined to $R_1 =$ 0.0537 for 1733 unique $I > 2 \sigma(I)$ reflections shows waimirite-(Y) is monoclinic, P2$_1$/n, with unit-cell parameters $a =$ 16.0161(1), $b =$ 5.7781(3), $c =$ 16.341(1) Å, $\beta =$ 116.704(8)°, $V =$ 1530.9 Å$^3$, and Z = 2. The structure of waimirite-(Y) consists of a backbone chain of trans-edges-sharing AlO$_4$ octahedra where adjacent octahedra are further linked to one another by AsO$_4$ tetrahedra in a staggered arrangement, forming Al(AsO$_4$)(OH)$_2$ chains of octahedra and tetrahedra. These chains are topologically identical to the chain in the structure of larinite. CaO polyhedral condense to these chains, forming columns, where CaO$_6$polyheda in adjacent columns link to one another by corner-sharing to form thick layers parallel to (101), further linked to AsO$_4$ tetrahedra. An extensive system of hydrogen bonds links the framework. The new mineral is named tapiataite for Enrique Tapia (1955–2008), a well-known Chilean mineral collector. Four cotype specimens are deposited in the Natural History Museum of Los Angeles County, U.S.A. O.C.G.