NEW MINERAL NAMES*

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Beartinite*


Electron microprobe analyses of the holotype sample from the Monte Rosa massif, Zermatt Valley, Switzerland, gave CaO 33.04, SrO 3.53, MgO 0.12, FeO 0.03, Al$_2$O$_3$ 15.91, Ce$_2$O$_3$ 0.04, La$_2$O$_3$ 0.03, SiO$_2$ 44.32, SO$_3$ 0.01, F 0.48, Cl 0.02, sum (less O = F + Cl) 97.62 wt%, corresponding to (Ca$_{3.74}$Sr$_{0.22}$)$_{3.96}$(Al$_{1.98}$-Mg$_{0.02}$)$_{2.00}$(P$_{3.97}$Si$_{0.03}$)$_{4.00}$F$_{0.16}$ close to the ideal formula Ca$_2$Al[PO$_4$](OH), with OH confirmed by structural refinement. Other analyses indicate appreciable Ca + Al ~ REE + Mg substitution. Occurs as yellowish aggregates, up to millimeter size, of partly euhedral, flat prismatic crystals and as smaller anhedral grains corroded by lazulite in concordant quartz segregations in gneiss and schist. Also present as a rock-forming accessory in pyrope-phenacite-quartzite and in coesite-bearing metapelites in the Dora Maira massif, western Alps, Italy. Yellowish color, white streak, possibly one poor prismatic cleavage, uneven fracture, H = 5, soluble in HCl, $D_{\text{calc}}$ = 3.25 g/cm$^3$ with $Z = 2$. Colorless and transparent in thin section, biaxial negative, $\alpha = 1.571(1), \beta = 1.660(1), \gamma = 1.696(1), 2V_{\text{meas}} = 65.0(3)^\circ$, $X//b$, distinct dispersion $r < v$. Single-crystal X-ray structure study ($R = 0.058$) gave monoclinic symmetry, space group $P2_1/m$, $a = 7.231(3), b = 5.734(2), c = 8.263(4) \text{Å}, \beta = 112.57(8)^\circ$. Strongest lines of the X-ray powder pattern (114-mm Gandolfi camera, CuKα radiation, calculated intensities) are 4.58(22,011), 3.05(100,211), 2.867(61,020), 2.754(27,103), 2.634(21,120), 2.568(39,112), and 2.444(19,211). Synthesized as flat prismatic crystals up to 150 µm.

The new name is for P. Beart (1902–1989) in recognition of his pioneering petrographic work on the high-pressure terranes of the western Alps. Textural relationships suggest that beartinite formed during the early high-pressure stages of Alpine metamorphism. Type material is in the Mineralogisch-Petrographisches Institut, University of Basel, Switzerland, and at the Musée de Mineralogie, École des Mines de Paris, and the Museum d’Histoire naturelle, Paris. J.L.J.

Cancrisilite*


The reported chemical composition is Na$_2$O 21.30, K$_2$O 0.10, CaO 0.68, MnO 0.11, Fe$_2$O$_3$ 0.33, Al$_2$O$_3$ 24.42, SiO$_2$ 43.11, CO$_2$ 4.82, SO$_3$ 0.36, H$_2$O 5.01, sum 100.24 wt%, corresponding to (Na$_{6.88}$K$_{0.02}$Ca$_{0.12}$Fe$_{0.04}$Mg$_{0.03}$)$_{32.00}$(Al$_{4.80}$-Si$_{7.20}$)O$_{24.00}$(CO$_3$)$_{1.10}$(SO$_4$)$_{0.04}$·2.79H$_2$O, ideally Na$_6$Al$_4$Si$_7$O$_{24}$CO$_3$·3H$_2$O. Dissolves readily with effervescence at room temperature in 10% HCl, HNO$_3$, and H$_2$SO$_4$. Single-crystal X-ray study showed the mineral to be hexagonal, space group $P6_3/mc$, unit cell $a = 12.575(3), c = 5.105(2) \text{Å}$. The powder pattern resembles that of cancrinite, though the symmetry is higher (cancrinite has space group $P6_3$). The strongest lines (27 given) are 6.30(70,110), 4.61(50,101), 3.65(90,300), 3.22(100,211), and 2.722(50,400). Occurs as anhedral lilac-colored grains 1–3 mm across, varying from water-clear to turbid, vitreous luster, conchoidal fracture, colorless in thin section, white streak, brittle, $H = 5$, $D_{\text{meas}} = 2.40(2), D_{\text{calc}} = 2.39$ g/cm$^3$ with $Z = 1$. Optically uniaxial negative, $\omega = 1.509(2), e = 1.490(2)$. Luminesces yellow in UV light, similar tofeldspars containing S$^2$– or SO$^4$2–. The IR spectrum has minima at 425, 455, 493, 573, 620, 686, 858, 980, 1120, 1453, 1560, and 3580 cm$^{-1}$. The mineral occurs in hyperalkalic pegmatites of the Lovozero alkalic massif, which also contain potassium feldspar, nepheline, arfvedsonite, aegirine, and 27 other listed minor minerals. The name refers to the anomalously high Si/Al ratio for a cancrinite-group mineral. Type material is at the Fersman Mineralogical Museum, Moscow, and at the Vernadskii Geological Museum, Moscow. D.A.V.

Guarinoite*, theresemagnanite*

H. Sarp (1993) Guarinoite (Zn$_{0.5}$Co$_{0.5}$Ni$_{0.5}$)(SO$_4$) (OH,Cl)$_{10}$. 5H$_2$O and theresemagnanite (Co$_{0.5}$Zn$_{0.5}$Ni$_{0.5}$)(SO$_4$)(OH,Cl)$_{10}$. 8H$_2$O, two new minerals from the Cap Garonne mine, Var, France. Archives des Sciences, 46(1), 37–44 (in French, English abs.).

Guarinoite

Electron microprobe and CHN analyses gave ZnO 33.31, CoO 22.17, NiO 6.74, CuO 0.05, SO$_3$ 11.85, Cl 33.31 wt%.
The mineral occurs in veins 1–5 cm wide in ultra-al-
kalic pegmatites of the Lovozero massif, Kola Peninsula,
associated with natrolite, steenstrupine, vuonnemite,
epistolite, mountainite, ilmajokite, and naphostite.
As with the synthetic analogue, the mineral is thought
to form from alkalic fluids that are impoverished in Ca
do.

The new name is for André Guarino, mineral collector.
Type material is at the Fersman Mineralogical Museum,
and the Vernadskii Museum, Moscow.

**Theresemagnanite**

Electro micrography and CHN analyses gave CoO 32.95, ZnO 20.42, NiO 3.18, CuO 0.16, SO 3.54, Cl 6.15, H 20 28.40, O = Cl 1.28, sum 100.02 wt%,
corresponding to (Co 3.47, Zn 1.95, Ni 0.36, Cu 0.02) 2.82, (SO 4) 1.08, (OH) 0.29,
Cl 1.25, 8.5H 20, ideally (Co, Zn, Ni) 6 (SO 4) (OH, Cl) 10.8, 5H 20.

Theresemagnanite is named for Thérèse Magnan, for
her contributions to knowledge about the Cu-Pb Cap
Garrone mine, Var, France. Type material is in the
Mineralogy Department of the Natural History Museum,
Geneva, Switzerland.

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**Manaksite**

A.P. Khomyakov, T.A. Kurova, G.N. Nechelyustov
(1992) Manaksite NaK MnSiO 4: A new mineral. Zapi-

Analysis by electron microprobe (average of three) gave
Na 2.95, K 2.65, Sr 0.2, Ca 0.2, Mg 0.3, Mn 17.2, Fe 0.8, Si 0.62, sum 100.4 wt%, corresponding to
(Na 0.1, K 0.2, Ca 0.1, Sr 0.1, Mn 0.2, Mg 0.2, Fe 0.2, Si 0.3, Sr 0.1,
ideally NaK MnSiO 4). This represents the Mn analogue
of fenaksite. Colorless to creamy or rosy, translucent and
transparent in thin section, perfect (001) and (100)
cleavages, steplike and hackly fracture, brittle, H = 5, 
nonfluorescent, D meas = 2.73(2), D calc = 2.71 g/cm 3 with
Z = 2. The infrared spectrum has a wide absorption peak
from 1142–982, with a maximum at 1060, and a series
of narrow peaks at 795, 770, 750 (weak), 692 (strong),
632 (weak), 605 (strong), 533 (moderate), 470, and 430
(strong) cm 1. Readily dissolves incongruently in cold 10%
HCl, and on heat treatment at 600 °C produces several
phases, including serandite. X-ray study indicated triclin-
ic symmetry, space group P 1, a = 9.993(9), b = 8.219(7),
c = 10.007(9) Å, α = 105.11(7), β = 100.76(6), γ = 114.79(6) °.
Strongest lines (27 given) of the powder pattern
are 4.89(70,010), 3.45(100,022,020), 3.26(90,013),
3.05(80,212,113), 2.880(70,023), 2.715(70,113,222), and
2.463(70,031). Optically biaxial negative, α = 1.540(2), 
β = 1.551(2), γ = 1.557(2), 2 V = 73°, with clear dispersive
r > v.

The mineral forms disseminated irregular grains from
1 to 3 mm across and in aggregates up to 5 mm, inter-

**Hydroxyancrinite**

A.P. Khomyakov, T.N. Nadezhina, R.K. Rastsvetaeva,
E.A. Pobedimskaya (1992) Hydroxyancrinite
Na 7.46, K 0.10, Ca 0.16, Mn 0.03, Fe 0.02, Si 0.37,
12H 20, ideally Na 7.46[Al 2.97Si 5.97]O 24(OH) 12.(CO 3) 0.36.
2.35H 20, ideally Na 7.46[Al 2.97Si 5.97]O 24(OH) 12.(CO 3) 0.36.

0.77, H 20 24.4, O = Cl 0.17, sum 99.12 wt%, correspon-
ding to (Zn 2.99, Co 2.16, Ni 0.67,25.8, (SO 4) 1.08, Cl 0.16 (OH) 0.30,
5.23H 20, ideally (Zn, Co, Ni, 0.1OCa, 0.16Mg, 0.03Fe, 0.02) 27.77(Al 6.03-

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stitial to rock-forming minerals in alkaline pegmatites of the Lovozero massif, Kola Peninsula. Associated minerals include potassium feldspar, nepheline, sodalite, cancrinite, arvedsonite, aegirine, analcime, albite, ussingite, makatite, villiaumite, and 16 accessory minerals. The new name is for the chemical composition. Type material is at the Fersman Mineralogical Museum, Moscow.

D.A.V.

**Nanansilite*\**


Analysis by electron microprobe (average of five) gave SiO\(_2\) 52.64, Al\(_2\)O\(_3\) 0.20, TiO\(_2\) [sic] 0.19, Fe\(_2\)O\(_3\) 1.65, Mn\(_2\)O\(_3\) 32.36, MgO 0.32, CaO 0.07, Na\(_2\)O 13.81, K\(_2\)O 0.05, SrO 0.42, BaO 0.05, sum 101.16 wt%, corresponding to [Na\(_{1.10}\)(K, Sr, Ba)\(_{0.21}\)]\(_{2.02}\)Mn\(_{13.19}\)Fe\(_{10.69}\)Mg\(_{0.28}\)Si\(_{22.16}\)O\(_{70.03}\), ideally NaMn\(^{+3}\)Si\(_2\)O\(_6\). The indicated valence of Mn was determined through X-ray photoelectron spectroscopy. Electron microdiffraction demonstrated that the new mineral is isostructural with aegirine. Refinement of the powder X-ray diffraction pattern gave a = 9.513(4), b = 8.615(3), c = 5.356(7) Å, \(\beta = 105.12^\circ\); strongest lines (23 given) are 6.330(80, 110), 4.306(80, 020), 2.927(90, 221), 2.886(80, 310), 2.584(90, 002), and 2.501(90, 131).

**Quadruphite*, polyphite*\**


The two new minerals belong to the lomonosovite group and occur in alkaline pegmatites of the Lovozero alkaline massif, Kola Peninsula, associated with potassium feldspar, nepheline, sodalite, arvedsonite, aegirine, cancrinite, analcime, albite, ussingite, makatite, villiaumite, lomonosovite, vuonnemite, sobolevite, kazakovite, lorenzenite, lintisite, lamprophyllite, zirsinallite, eudialyte, parakeldyshite, terskite, belovite, neptunite, serandite, and loparite. The minerals are barely distinguishable by optical and macroscopic properties. Both new minerals form flakes on (001), 1–2 mm thick and 3 mm across, grown epaxially on lomonosovite and sobolevite. The flakes are brittle, \(H = 5\), light brown, nonfluorescent, translucent, and transparent in thin section. Luster is vitreous and resinous on fractures, pearly to mirrorlike or metallic on cleavages. Stepplike fracture, perfect (001) and less perfect (110) and (100) cleavages. The minerals dissolve easily in HCl. Pleochroic from colorless (X) to yellowish (Y, Z) with \(X < Y \leq Z\); dispersion strong, \(r < v\).

**Polyphite**

Analysis by electron microprobe (average of three) gave Na\(_2\)O 28.1, SrO 0.4, BaO 1.1, CaO 5.3, MgO 1.1, MnO 4.3, FeO 0.3, SiO\(_2\) 16.5, ZrO\(_2\) 4.1, TiO\(_2\) 13.7, NbO\(_2\) 3.8, P\(_2\)O\(_5\) 19.2, F 3.4, O = F 1.4, sum 99.99 wt%, corresponding to Na\(_{13.21}\)(Ca\(_{1.38}\)Ba\(_{0.10}\)Sr\(_{0.06}\))\(_{2.86}\)(Mg\(_{0.59}\)Mn\(_{0.28}\)Fe\(_{0.06}\))\(_{2.00}\)(Ti\(_{12.71}\)Mn\(_{0.64}\)Nb\(_{0.24}\)Zr\(_{0.15}\)F\(_{0.05}\))\(_{2.50}\)Si\(_{24.89}\)O\(_{70.03}\)F\(_{2}\), ideally Na\(_{14}\)Ca\(_{12}\)Mg\(_3\)Ti\(_2\)[-Si\(_2\)O\(_7\)]\((PO_4)\)\(_4\)F\(_2\). X-ray study showed the mineral to be triclinic, \(a = 5.415(2), b = 7.081(3), c = 20.34(1) \AA, \alpha = 86.85(4), \beta = 94.40(4), \gamma = 89.94(3)^\circ, Z = 1\). The strongest lines (14 given) are 2.880(100, 007), 2.702(80b, 20T, 200), 2.636(70, 107), 2.050(50, 207, 222), and 1.600(50, 322, 12.10). Optically biaxial negative, \(\alpha = 1.630, \beta = 1.678, \gamma = 1.697, 2V = 62^\circ, D_{\text{meas}} = 3.12, D_{\text{calc}} = 3.11 \text{g/cm}^3\).

**Quadruphite**

Analysis by electron microprobe (average of three) gave Na\(_2\)O 28.0, SrO 0.4, BaO 1.1, CaO 8.3 MgO 1.3, MnO 5.6, FeO 0.2, SiO\(_2\) 13.2, ZrO\(_2\) 1.6, TiO\(_2\) 12.0, NbO\(_2\) 2.7, P\(_2\)O\(_5\) 23.3, F 5.1, O = F 2.1, sum 100.4 wt%, corresponding to (Na\(_{14.65}\)Mn\(_{0.35}\))\(_{21.00}\)(Ca\(_{2.70}\)Ba\(_{0.11}\)Sr\(_{0.02}\))\(_{72.86}\)(Mg\(_{0.59}\)- Mn\(_{0.28}\)Fe\(_{0.06}\))\(_{2.00}\)(Ti\(_{12.71}\)Mn\(_{0.64}\)Nb\(_{0.24}\)Zr\(_{0.15}\)F\(_{0.05}\))\(_{2.50}\)Si\(_{24.89}\)O\(_{70.03}\)F\(_{2}\), ideally (Na\(_{14}\)Ca\(_{12}\)Mg\(_3\)Ti\(_2\)[-Si\(_2\)O\(_7\)]\((PO_4)\)\(_4\)O\(_2\)F\(_6\)). X-ray study showed the mineral to be triclinic, \(a = 5.412(2), b = 7.079(3), c = 26.56(1) \AA, \alpha = 95.21(4), \beta = 93.51(2), \gamma = 90.10(3)^\circ, Z = 1\). Strongest lines (28 given) of the powder pattern are 2.937(100, 009), 2.702(80b, 20T, 200), 2.636(70, 107), 2.050(50, 207, 222), and 1.600(50, 322, 12.10). Optically biaxial negative, \(\alpha = 1.600, \beta = 1.658, \gamma = 1.676, 2V = 56^\circ, D_{\text{meas}} = 3.07, D_{\text{calc}} = 3.00 \text{g/cm}^3\) with \(Z = 1\).
the formula unit. Type material is at the Fersman Mineralogical Museum, Moscow. D.A.V.

Sitinakite*

Analysis by electron microprobe (average of three, H₂O by TGA) gave Na₂O 10.79, K₂O 4.93, CaO 0.05, SrO 0.96, BaO 0.58, Ce₂O₃ 0.12, Fe₂O₃ 0.16, Nb₂O₅ 5.05, Ta₂O₅ 0.05, TiO₂ 46.68, ZrO₂ 0.08, SiO₂ 17.80, H₂O 11.7, sum 98.95 wt%, corresponding to (Na₂₂.₂₈Kₐ₆.₆₈Sr₀.₀₆Ba₀.₀₂Ca₀.₀₁)₂₃.₀₃(Ti₃.₈₂Nb₀.₂₅Fe₀.₀₁)₂₄.₀₈Si₁.₉₄O₃.₀₁(OH)₀.₅₄O₀.₄₆; 3.₉₈H₂O, ideally Na₂KTi₄Si₂O₇(OH)·4H₂O. X-ray study (single crystal and powder diffraction) showed the mineral to be tetragonal, space group P₄/ mmcm, a = 7.819(2), c = 12.099(4) Å. Strongest lines (34 given) are 7.84(100,100), 6.02(100,002), 3.25(80,113), 2.608(60,300), and 2.003(70,006). Crystals with an axial character may be indexed on the space group Pcc2. Symmetry reduction may be related to high concentrations of Nb, or to filling of zeolite-like channels by K and H₂O. IR spectroscopy revealed the presence of both H₂O and OH by absorption lines at 1660, 3000, 3350, and 3354 cm⁻¹. DTA showed no endo- or exothermic events. X-ray studies of heated material showed no change at 400 °C, a change to Na₂Ti₂O₄ at 600 and 1000 °C, and a change to rutile at 1100 °C. Occurs as equant and short prismatic crystals, 1 × 1 × 2 mm, and in 3–4 mm patches of intergrown crystals. Light brown with a pale waxy tint, rarely colorless, vitreous luster, white streak, no fluorescence, H₃₀–50 = 301–412 kg/mm² (average 356), or H = 4.5. Brittle, perfect (100) cleavage, parting on (001), steplike fracture. Dₘₐₑₙₙ = 2.86(6), Dₜₐ₇ = 2.87–2.89 gm/cm³ with Z = 2. No dissolution observed in H₂O, HCl, or HNO₃ at room temperature. Optically uniaxial positive, ω = 1.780(3), ε = 1.988(3); may show anomalous 2V = 10–11°.

The mineral occurs in hydrothermal natrolite massif in pegmatites of the Khibinsky alkali massif, closely associated with variagradovite and related also to natrolite, aegirine, magnesia astrophyllite, shchelkavite, lorenzenite, lamprophyllite, pectolite, annilite, djerdjherite, orthoclase, nepheline, villiaumite, mosandrite, and nenadkevichite. The name is for the chemical composition. Type material is at the Mining Museum, Saint Petersburg, and at the Kola Science Center, Apatity. D.A.V.

Wadalite

The mineral occurs in a skarn xenolith in two-pyroxene andesite at a quarry in Tadano, Koriyama City, Fukushima, Japan, and in skarn at the La Negra mine, Que-rétaro, Mexico. Electron microprobe analysis (not given) and Dₘₑₙₙ = 3.01 g/cm³ led to the formula (Ca₈,Mg₂₃)₀.₃₅(Al₂₄,Mg₂₆)₀.₆₅(Fe₂₄,Mg₆)₀.₃₅(Si₂₄,Mg₆)₀.₃₅(Fe₂₄,Mg₆)₀.₃₅(Fe₂₄,Mg₆)₀.₃₅Cl₁₅₈Cl₆₄, ideally Ca₈Al₃Si₄O₁₆Cl₃, Dₜₐ₇ = 3.056 g/cm³ with Z = 4. Single crystal X-ray structure study (R = 0.062) indicated cubic symmetry, space group I₄₃d, a = 12.001(2) Å. The powder pattern is stated to be indistinguishable from that of grossular.

Discussion. Use of the name prior to the appearance of a full description is inappropriate. It is not stated whether the mineral name has been approved by the CNMMN. J.I.J.

Cu₆Bi₃S₆, Cu-Pb-Fe sulfide

Electron microprobe analysis gave Cu 38.42, Sb 0.11, Bi 42.81, S 19.08 wt%, corresponding to Cu₆₀₈(Bi₂₇₋Sb₀₁₅)S₆.₃₅. Light yellow in reflected light, reflectance identical to that of chalcocite, strongly anisotropic with polarization colors from bright yellow to cream. Size is not stated, but photomicrographs suggest about 45 × 50 μm. Because of the distinct optical properties, it is thought that the mineral might be a dimorph of wittichenite. Occurs as intergrowths with bornite, enargite, tennantite, and chalcopyrite. Also present in the same assemblage is a second unidentified mineral, possibly 20 × 50 μm, for which electron microprobe analysis gave Cu 63.50, Fe 2.34, Pb 12.29 (qualitative determination), S 20.87, sum 100 wt%, corresponding to Cu₁₂₆Pb₀.₇₉Fe₀.₅₂S₆.₃₅. J.L.J.

Pd-Bi chloride, Pd-Bi sulfide(?)

Three electron microprobe analyses of each of three grains (size not stated, but photomicrographs suggest up to 30 × 35 μm) gave a range of Pd 27.59–35.05, Pt 0.84–1.97, Bi 44.21–58.02, Te n.d.–0.53, Pb 0.47–1.47, Cl 3.66–5.96, sum 88.46–92.64 wt%, remainder O or OH. Pinkish brown to pale brown pleochroism in reflected light. The phase is associated with insizwaite, michenerite, hesite, and magnetite.

Three grains of a Cl-bearing Pd-Bi sulfide(?) up to 15 × 50 μm, were observed in association with bismoclite in fractures in magnetite. Electron microprobe analysis for one grain (three analyses reported) gave Pd 50.64, Pt 0.40, Bi 21.42, Pb 0.72, Fe 1.28, Ni 0.51, Zn 0.52, S
11.74, Cl 1.19, sum 88.42 wt%, plus O. In reflected light, gray, isotropic. J.L.J.

BaS₂O₃·H₂O, Ba₂S₂O₅F₂, BaSO₃, Ba₅Al₃S₁₀(OH)₉·8H₂O

BaS₂O₃·H₂O
Occurs as colorless, glassy linings of cracks and as rectangular crystals showing {100}, {010}, and {001}. Electron microprobe analysis gave Ba 51.7, S 23.5 wt%, very close to that of synthetic BaS₂O₃·H₂O, which was used as a microprobe standard. The X-ray powder pattern and infrared spectrum also match those of the orthorhombic, synthetic phase. Identified in slags from three sites in Yorkshire and two in Derbyshire, U.K. Associated with the other three phases abstracted here.

Ba₂S₂O₅F₂
Typically forms colorless, transparent, near-rectangular plates up to 2 mm across that are polysynthetically twinned, triclinic crystals clustered as cavity linings. Less common as white coatings with a radiating texture. Electron microprobe analyses gave Ba 65.9, S 13.5, Al 0.4, Sr 0.3 (variable) wt%; Ba₅S₂O₅·F₂ requires Ba 64.7, S 15.1%. The infrared spectrum shows sharp absorption maxima at 1132, 1019, 687, 554, and 527 cm⁻¹, which are characteristic of thiosulfate and also indicate the absence of hydroxide and other oxyanions. Single-crystal X-ray study showed triclinic symmetry, space group PPDF, a = 22.63(2), b = 4.624(2), c = 4.581(4) Å; α = 90.03(4), β = 95.82(8), γ = 89.97(5)°. Widespread in slags from two sites in Yorkshire and two in Derbyshire.

BaSO₃
Occurs as pale yellow to dirty greenish yellow, granular, waxy-looking infillings of cavities to 2 mm across. Electron microprobe analyses gave Ba 62.0, Sr 0.3, S 11.8 [sic] wt%; (Ba₀.₉₀Sr₀.₀₁)SO₃ requires Ba 62.7, Sr 0.4, S 14.8%. The X-ray powder pattern and infrared spectrum match those of synthetic BaSO₃. Relatively rare and identified from only one site, in Yorkshire.

Ba₅Al₃S₁₀(OH)₉·8H₂O
Typically forms transparent, orange-yellow blades and pseudohexagonal plates to 1 mm. Some plates are thin, micaceous, and up to several millimeters across. Electron microprobe analysis gave Ba 33.6, Sr 5.3, Ca 0.6, Al 9.0, S 15.2 wt%; the formula (Ba₀.₃₂Sr₀.₃₃Ca₀.₁₀Al₂₀.₀₁S₀.₃·Ba(OH)₂·2Al(OH)₃·5H₂O requires Ba 33.6, Sr 5.4, Ca 0.6, Al 8.7, S 15.5%. Single-crystal X-ray study indicated monoclinic symmetry, space group P2₁/c, a = 8.786(8), b = 19.208(9), c = 11.105(6) Å, β = 105.98°. Three of the H₂O molecules are only loosely held in the structure; their ready loss during or prior to microprobe analysis accounts for the lower hydration relative to the structurally determined ideal formula containing 8H₂O. Although uncommon, this phase has been identified in a slag from one site in Yorkshire, one in Derbyshire, and one at Sorn, Scotland.

Specimens have been deposited in the British Museum (Natural History), London, and in the Natural History Museum of Los Angeles County, Los Angeles, California.

Discussion. Although there are numerous accepted mineral species that were formed in similar environments, the current practice of the CNMMN is not to approve as new minerals those phases that originate from slags. The CNMMN practice also applies to phases formed in mine fires and burning coal dumps. J.L.J.

Ba-dominant brewsterite

Electron microprobe analysis (not given) led to the formula (Ba₁.₈₀Mg₀.₀₁Na₀.₀₁K₀.₀₁Ca₀.₀₁Sr₀.₀₁Fe₀.₀₁₂Al₂₀.₀₉₋₁₀₀Si₁₁.₇₈AI₂₉₋₁₀₀O₃₂₋₁₀₀H₂O, where n = 9.82 by X-ray structure determination (R = 0.051). Occurs as colorless to pale pink prismatic crystals to 0.2 mm long and as radiating and parallel aggregates. Optically biaxial positive, α = 1.514(2), β = 1.516(2), γ = 1.528(2), 2Vₚ = 45(1), 2Vₑ = 44°. Single-crystal X-ray study indicated monoclinic symmetry, space group P2₁/m, a = 6.790(1), b = 17.581(4), c = 7.735(1) Å; β = 94.50(3)°. The mineral occurs in fractures in radiolaritic metacherts and in a schistose metapelite above radiolaritic strata at the Cerchiara mine near Faggiona, La Spezia, Eastern Liguria, Italy. J.L.J.

New Data

Native brass

The uppermost 0–2 cm of unconsolidated sediments on the flanks of the East Pacific Rise near 13°N, 21°S, contain sheaflike intergrown scales of native cadmium, plates of native nickel, layered fragments, scales, and fibers of native aluminium, honeycomb-textured native copper, and plates of native iron. The last contains round inclusions of native silicon and native titanium. Also present are flakes and lumps of Zn with up to 13.35 wt% Fe, Zn with up to 6.24 wt% Al, and thin, malleable, lathlike flakes of brass with a brass yellow to gray color. Electron microprobe analyses of the brass (two and five par-
articles, respectively) gave Cu 60.50, 61.39, Zn 37.25, 37.90, Al 0.56, Si 0.03, sum 98.34, 99.29 wt%. X-ray powder data are given only for Al, Cu, Zn, and Fe. The origin of the metals is attributed to hydrothermal activity near active vents.


Huanghoite-(Ce)

Single-crystal X-ray structure determination of huanghoite-(Ce) gave trigonal symmetry, \( a = 5.072(1) \), \( c = 38.46(1) \text{ Å} \), \( Z = 6 \), and the new space group \( R\bar{3}m \). The results are in accord with data abstracted in Am. Mineral. 78, 1110 (1993) for the synthetic Sm analogue. J.L.J.