# New Mineral Names*

## GLENN POIRIER AND PAULA C. PIILONEN†

Research Division, Canadian Museum of Nature, P.O. Box 3443, Stn. D, Ottawa, ON K1P 6P4, Canada

### GJERDINGENITE-NA AND GJERDINGENITE-CA

I.V. Pekov, N.V. Chukanov, N.A. Yamnova, A.E. Zadov, P. Taras-soff (2007) Gjerdingenite-Na and Gjerdingenite-Ca, two new mineral species of the Labuntsovite Group.

Both minerals are found in peralkaline pegmatites related to agpaitic feldspathoidal syenites and both are alteration products of vuonnemite. Gjerdingenite-Na was collected in a hydro-thermally altered pegmatite cutting a nepheline syenite at the De-Mix (now Poudrette) quarry, Mont Saint-Hilaire, Québec. It is a fairly abundant constituent of vuggy regions of the pegma-tite. Associated minerals are microcline, albite, aegirine (early coarse prismatic, and late acicular), analcime, a eudialyte-group mineral, natrolite, epistolite, polylithionite, steacyite, thorite, ekanite, brockite, fluorapatite, yofortierite, calcite, hemimorphite, sauconite (?), and earthy Mn oxides. With epistolite it forms pseudomorphs up to 12 cm in length. The crystals are equant, prismatic, or tabular. Gjerdingenite-Ca was collected at Mount Karnasurt, Lovozero massif, Kola Peninsula in a hydrothermally altered lensoid pegmatite in aegirine lujavrite. It has two modes of occurrence; the holotype specimen was found in the margins of the pegmatite associated with microcline, natrolite, aegirine, organovaite-Mn, organovaite-Zn, beryllite, epididymite, altered steenstrupine-(Ce), ranciéite (pseudomorph after sérandite), and yakhontovite where it forms centimeter-sized pseudomorphs after vuonnemite. In the pegmatite core it forms smaller crystals in vuonnemite pseudomorphs consisting of to pseudomorphs after vuonnemite consisting of komarovite, organovaite-Mn, and strontiopyrochlore. In both minerals the major forms are pinacoids {100}, {001}, and {010} except for gjerdingenite-Ca whose crystals are elongate along [010].

Gjerdingenite-Na and Ca are both transparent in small grains and opaque in larger grains, both have a white streak and vitreous luster and do not fluoresce in ultraviolet light. Gjerdingenite-Na ranges from colorless to pale pink, whitish pink to cream colored while gjerdingenite-Ca is white or pale brown to pinkish brown. Both minerals are brittle with an uneven fracture and no cleavage or parting. Mohs hardness is 5 for both minerals. Gjerdingenite-Na has a measured density of 2.71(1), and a calculated density of 2.69 g/cm$^3$. Gjerdingenite-Ca has a measured density of 2.79(1), and a calculated density of 2.775 g/cm$^3$.

Both minerals are optically biaxial positive. For gjerding-enite-Na: $\alpha$ 1.647(2), $\beta$ 1.653(2), $\gamma$ 1.755(3), $2V_{meas}$ = 25(10)°, $2V_{calc}$ = 28.5°. For gjerdingenite-Ca: $\alpha$ 1.680(1), $\beta$ 1.682(2), $\gamma$ 1.762(3), $2V_{meas}$ = 25(10)°, $2V_{calc}$ = 19°. For both minerals, dis-persion was not observed, and the optical orientations are $Y = b$. Gjerdingenite-Na and the white variety of gjerdingenite-Ca are colorless and non-pleochroic. The pinkish brown variety of gjerdingenite-Ca shows very weak pleochroism: $X$ and $Z$ = colorless, $Y$ = pale yellowish.

Chemical compositions were determined by electron micro-probe except for $H_2O$, which was determined by thermogravi-metric analysis. The average composition of gjerdingenite-Na (ranges in brackets) is $Na_2O$ 4.04(3.7–4.2), $K_2O$ 3.97(3.8–4.2), CaO 1.95(1.6–2.1), BaO 0.92(0.5–1.2), MnO 0.27(0.2–0.3), ZnO 0.17(0.1–0.3), $Fe_2O_3$ 0.61(0.5–0.7), $Al_2O_3$ 0.20(0.05–0.03), $SiO_2$ 41.02(40.2–41.6), $TiO_2$ 10.20(9.2–10.5), $Nb_2O_5$ 27.78(21.7–28.4), $H_2O$ 9.85, sum 100.98 wt%, giving an empiri-cal formula (based on $[(Si,Al)_8O_{24}](O,OH)_4)]$ of $(K_{0.98}Na_{0.62}Ca_{0.37}Ba_{0.07})_{\Sigma2.04}(Na_{0.90}Ca_{0.04}Mn_{0.04}Zn_{0.02})_{\Sigma1.00}(Nb_{2.43}Ti_{1.49}Fe^{3+}_{0.09})_{\Sigma4.01}$ $(Si_{7.95}Al_{0.05})_{\Sigma8}O_{24}[(OH)_{2.09}O_{1.91}]_{\Sigma4}\cdot5.32H_2O$. For Gjerdingenite-Ca, the average composition (and range) is $Na_2O$ 1.14(0.9–1.3), $K_2O$ 3.61(3.1–4.2), CaO 3.56(2.3–4.5), SrO 3.47(3.1–3.8), BaO 1.04(0.8–1.3), MnO 0.84(0.4–1.1), ZnO 0.05(0.0–0.2), $Fe_2O_3$ 0.19(0.1–0.2), $Al_2O_3$ 0.13(0.1–0.2), $SiO_2$ 39.29(38.0–40.7), $TiO_2$ 9.96(8.7–11.1), $Nb_2O_5$ 27.34(25.8–28.4), $H_2O$ 9.23, sum 99.85 wt%, giving an empirical formula of $(K_{0.93}Na_{0.45}Sr_{0.41}Ca_{0.15}Ba_{0.08})_{\Sigma2.02}(Ca_{0.62}Mn_{0.14}Fe_{0.03}Zn_{0.01})_{\Sigma0.80}(Nb_{2.51}Ti_{1.52})_{\Sigma4.03}(Si_{7.97}Al_{0.03})_{\Sigma8}$ $O_{24}[O_{2.86}(OH)_{1.14}]_{\Sigma4}\cdot5.67H_2O$.

IR-spectroscopy of the new species produces spectra that are similar to other members of the kuzmenkoite group, espe-cially gjerdingenite-Ca which closely resembles the spectrum of karupmøllerite-Ca. Powder diffraction patterns were used to determine the cell dimensions and crystal structures (us-ing the Reitveld method) for both minerals. The diffraction pattern for gjerdingenite-Na was obtained using an ADP-2 diffractometer with Cu$K\alpha_1 = \alpha_2$ radiation while the pattern for gjerdingenite-Ca was obtained using a STOE STADIP focusing diffractometer with Mo$K\alpha$ radiation and a Ge(111) monochromator. Both minerals are monoclinic, space group $C2/m$. The unit-cell dimensions of gjerdingenite-Na are: $a$ 14.626(2), $b$ 14.160(1), $c$ 7.910(1) Å, $\beta$ 117.43(2)°, $V$ 1454(1) Å$^3$, $a$ 1.0329, $b$ 1, $c$ 0.5586, $Z$ = 2. The unit-cell dimensions of gjerdingenite-Ca are: $a$ 14.6365(6), $b$ 14.2049(5), $c$ 7.8919(4)

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Å, β 117.467(5)°, $V$ 1455.9(2) Å$^3$, $a$ = 1.0303, $b$ = 1, $c$ = 0.5555, $Z$ = 2. The strongest reflections in the X-ray powder-diffraction pattern for gjerdingenite-Na [$d$(in Å)($I$)($hkl$)] are: 7.102(29)(020), 7.044(54)(001), 6.510(42)(200), 4.995(44)(02$\bar{1}$, 021), 3.252(51)(42$\bar{1}$), 3.249(100)(400), 3.148(28)(02$\bar{2}$,022), and for gjerdingenite-Ca 7.100(100)(020), 6.999(88)(001), 6.476(38)(20$\bar{1}$), 4.985(78)(02$\bar{1}$,021), 3.252(42)(42$\bar{1}$), 3.246(43)(400), 3.167(46)(04$\bar{1}$,041), 3.140(36)(02$\bar{2}$,022).

The structure refinements of the two minerals show that gjerdingenite-Na and gjerdingenite-Ca are isostructural with other members of the kuzmencoite subgroup. The formula of gjerdingenite-Na from structural data is $(\square)_2(K_{1.0}Na_{0.8}Ca_{0.2})_{\Sigma 2}$ $(\square)_2(Na_{1.7} Ca_{0.3})_{\Sigma 1}(Nb_{1.3}Ti_{0.7})_{\Sigma 2}(Nb_{1.1}Ti_{0.9})_{\Sigma 2}Si_8O_{24}[OH]_{2.25}O_{1.75}\cdot 5 H_2O$. The formula of gjerdingenite-Ca obtained from the structural data is $(\square)_2(K_{0.9}Na_{0.4}\square_{0.7})_{\Sigma 2}(\square_{1.3}Sr_{0.4} Ca_{0.2}Ba_{0.1})_{\Sigma 2}(Ca_{1.0}Mn_{0.3}\square_{0.7})_{\Sigma 1}(Nb_{1.4}Ti_{0.6})_{\Sigma 2}(Nb_{1.2}Ti_{0.8})_{\Sigma 2}Si_8O_{24}O_{2.6}[OH]_{1.4}\cdot 5.7H_2O$

Gjerdingenite-Na is the first member of the labuntsovite group with the D site dominated by Na and gjerdingenite-Ca is the second member (after karupmøllerite-Ca) with dominant Ca in this site. The authors suggest that the rarity of labuntsovite-group minerals in which Ca and Na dominate the D site is the result of the need for a strong enrichment of hydrothermal fluids in either Ca + Na, Ca + K or Na + K. They further suggest that the existence of karupmøllerite-Ca (in which Ca dominates the D site and Na dominates the extra-framework sites) require a stronger affinity for Ca over Na in the D site

The type material of gjerdingenite-Na is deposited at the Canadian Museum of Nature (catalog no. CMNMC 85457, gjerdingenite-Na) and in the Fersman Mineralogical Museum of Russian Academy of Sciences, Moscow catalog no. 92112). Gjerdingenite-Ca is deposited in the Fersman Mineralogical Museum of Russian Academy of Sciences, catalog no. 92111. **G.P.**

## KOCHSÁNDORITE*

Sajó, I.E., Szakáll, S. (2007) Kochsándorite, a new Ca-Al carbonate mineral species from the Mány coal deposit, Hungary. Can. Min., 45, 479–483.

Kochsándorite crystals form from the weathering of böhmite, pyrite, and calcite and occur as spherical aggregates that form pale brown strings in Eocene brown coal deposits of the Tatabánya coalfield in the northeastern part of the Transdanubian Mountains, Hungary. Associated alteration minerals include gibbsite, gypsum, and Fe-oxides with subsidiary amounts of kaolinite, illlite, alumohydrocalcite, and felsöbányaite.

Crystals of kochsándorite are acicular and form radial aggregates with blade lengths on the order of 200–300 μm and widths of approximately 20 μm. Twinning was not observed. It produces a white streak and has a silky to vitreous luster. Crystals are very brittle with Mohs hardness estimated to be 2 to 2.5. No cleavage was observed. It dissolves easily with effervescence in dilute hydrochloric acid. Calculated and observed densities are 2.514 and 2.486 g/cm$^3$ respectively. Optical properties could not be completely determined; crystals are biaxial negative with no pleochroism and weak r < v dispersion. Indices of refraction are α 1.597(3), β not determined, γ 1.603(6)°. 2$V$ was not determined

Quantitative chemical analyses were performed using prompt gamma activation analyses, EDS, and thermogravimetry, although no data are provided for major elements. The authors provide an empirical formula of $Ca_{0.9}Al_2(CO_3)_{1.9}(OH)_4\cdot 1.3H_2O$. An H$_2$O content (from 1000 °C LOI) of 47.3 wt% agrees well with calculated water contents and XRD of TG residues confirms pure CaAl$_2$O$_4$ confirming the 1:2 Ca:Al ratio.

Infrared spectroscopy in the 4000–400 cm$^{-1}$ range show sharp absorption bands at 559, 973, 1361, 1445, 1520, 1574, 1652, 3145, 3452, and 3548 cm$^{-1}$.

X-ray powder diffraction scans were collected using a Bragg-Brentano diffractometer with Cu$K\alpha$ radiation. Of sixty lines, the strongest are $d$($I$, $hkl$) 7.8607(87, 101), 7.7830(67.8, 200), 5.9154(100, 201), 4.3718(85.8, 102), 3.5772 (14.9, 401), 2.9570(47.6, 402), 2.9455(44, 501), 2.5687(17, 502), 1.9977(12.7, 702), 1.9449(14.2, 800), 1.9021(25.7, 620). Indexing and refinement of the data resulted in an orthorhombic unit cell with $a$ 15.564(6), $b$ 5.591(4), $c$ 9.112(4) Å, $V$ 792.9(3) Å$^3$. Space group is $Pnma$.

Kochsándorite is named for Sándor Koch, (1896–1983) professor in the Department of Mineralogy, Petrography and Geochemistry Josef Atilla University. Type specimens are in the mineral collection of the Hungarian Natural History Museum, Budapest (catalog no. 568/2004), Herman Ottó Museum, Miskolc (catalog no. 2004.72), and Minerals of the Carpathian Basin–Mineral Museum of Lajos Kövecses-Varga, Siófok (catalog no.12004/1–3). **G.P.**

## KRIVOVICHEVITE

V.N. Yakovenchuk, Y.A. Pakhomovsky, Y.P. Men'shikov, J.A. Mikhailova, G.Yu. Ivanyuk, O.A. Zalkind (2007) Krivovichevite, Pb$_3$[Al(Oh)$_6$](So$_4$)(OH), a new mineral species from the Lovozero Alkaline Massif, Kola Peninsula, Russia. Can Min., 45, 293–305.

The mineral is from a natrolite-aegirine-orthoclase vein in a lujavrite at Mt. Lepkhe–Nelm in the Lovozero Massif. This vein is also the type locality for kupletskite. Krivovichevite occurs as 1 cm colorless isometric grains within pseudomorphs after galena. Other minerals in the pseudomorphs include anglesite, cerrusite, hydrocerussite, lanarkite, and leadhillite as well as several unknown lead-bearing phases. Krivovichevite is believed to be a low-temperature hydrothermal alteration product of galena and natrolite by oxidizing solutions. The mineral is pale gray to colorless and has a vitreous luster and a white streak. It is brittle with a conchoidal fracture, no cleavage, and an approximate Mohs hardness of 3. Due to the krivovichevite's easy solubility in water, heavy liquids, benzene, alcohol, and acetone density and optical properties were difficult to determine. It is colorless and non pleochroic in transmitted light. It is uniaxial negative: $n$(meas.) ≈ 1.9; $n$(calc.). = 1.85. Calculated density is 5.37 g/cm$^3$.

Average composition by WDS (H$_2$O by Penfield method) is PbO 76.49(75.67–77.05), CaO 0.02(0.0–0.06), Al$_2$O$_3$ 5.38(4.88–5.44), SO$_3$ 9.27(7.15–9.35), H$_2$O 7.20, total 98.36 wt%. The empirical formula, calculated on the basis of Pb + Ca + Al + S = 5 apfu is $Pb_{3.04}Al_{0.94}(S_{1.03}O_{3.98})(OH)_{7.08}$ leading to a simplified formula of $Pb_3Al(SO_4)(OH)_7$

Infrared absorption spectrometry produces 13 absorption bands. Absorption at 447, 610, 720, 940, 1084, and 1114 cm$^{-1}$ are associated with sulphate group vibrations. Absorption at 595, 1023, 3410, and 3486 cm$^{-1}$ is due to stretching and bending vibrations of (OH)$^{-}$ groups. Peaks at 458, 505, and 518 cm$^{-1}$ are assigned to Al-O vibrations.

Structure determination was performed using data collected using the precession method and a CCD detector. Krivovichevite is trigonal and its space group is $R3c$. The structure consists of isolated Al(OH)$_6^{3-}$ octahedral, (SO$_4$)$^{2-}$ tetrahedra, Pb$^{2+}$ cations, and OH$^{-}$ anions. The authors relate krivovichevite to the beudantite-alunite family. Powder diffraction data were collected using Debye–Scherrer camera and Fe$K\alpha$ radiation. The strongest lines in the pattern are $d(I,hkl)$: 3.58(100,201), 3.10(60,116), 2.591(90,119), 2.216(50,030), 2.048(70,036), 1.893(50,2 1 11), 1.704(80,317), and 1.318(50,2 0 22). The unit-cell parameters are $a$ 7.693(8), $c$ 31.57(9) Å, $V$ 1618(6) Å$^3$, $Z = 6$.

The name is for Sergey Vladimirovich Krivovichev, Professor of mineralogy and crystallography at St. Petersburg State University. The holotype is held at the Mineralogical Museum of St. Petersburg State University and a cotype is held at the Geological and Mineralogical Museum of the Geological Institute of the Kola Science Centre of Russian Academy of Sciences, Apatity, Russia (no. 6281/1.07.2005). **G.P.**

## NUMANOITE*

M. Ohnishi, I. Kusachi, J. Yamakawa, M. Tanabe, S. Kishi, T. Yasuda (2007) Numanoite, Ca$_4$cub$_4$o$_6$(Oh)$_6$(Co$_3$)$_2$, a new mineral species, the Cu analogue of borcarite from the Fuka mine, Okayama Prefecture, Japan. Can. Min., 45, 307–315.

Numanoite occurs as 1 to 5 mm cores in crystals or veins of boracite in a skarn in the Fuka Mine, Okayama Prefecture, Japan. Numanoite and boracite are found in cavities and veins in crystalline limestone. Associated minerals include nifontovite, bultfonteinite, calcite, and an unidentified magnesium silicate mineral. Numanoite is blue-green to colorless and colorless to pale blue-green in thin section. Two perfect cleavages are observed and twinning is absent. The measured Mohs and Vickers hardness are 4.5 and 376 kg/mm$^2$, respectively. The luster of numanoite is vitreous. Measured and calculated densities are 2.96(3) and 2.93 g/cm$^3$, respectively. Crystals dissolve easily with effervescence in weak hydrochloric acid. No fluorescence was observed. The measured optical properties are: biaxial negative, $\alpha$ 1.618(2), $\beta$ 1.658(2), $\gamma$ 1.672(2), with $2V_{calc}$ equal to 60°.

Quantitative analyses obtained fro WDS and TGA (H$_2$O and CO$_2$) yield the following average composition (range in brackets): B$_2$O$_3$ 24.09(23.43–25.39), CaO 38.11(37.52–38.66), CuO 10.32(8.55–11.90), MgO 1.02(0.34–1.76), ZnO 0.51(0.04–1.08), CO$_2$ 15.80, H$_2$O 9.75. The empirical formula, calculated on the basis of O = 18, is Ca$_{3.898}$(Cu$_{0.744}$Mg$_{0.145}$Zn$_{0.036}$)$_{\Sigma0.925}$B$_{3.969}$O$_{5.615}$ (OH)$_{6.208}$(CO$_3$)$_{2.059}$, ideally Ca$_4$CuB$_4$O$_6$(OH)$_6$(CO$_3$)$_2$.

Powder diffraction data were obtained with a Rigaku RINT–2500V diffractometer with graphite-monochromatized Cu$K\alpha_1$ radiation generated at 40 kV and 240 mA, and single crystal data were obtained using a four-circle diffractometer (Rigaku AFC–5R) with graphite-monochromatized Mo$K\alpha$ radiation generated at 50 kV and 200 mA. The strongest lines in the X-ray powder diffraction pattern [$d$ in Å ($I$, $hkl$)] are 7.57(100, 110), 2.671(84, $\overline{4}$21), 2.727(68, 221), 1.887(52, 041,440), 2.272(48, $\overline{3}$31), 2.899(44, 600), and 1.698(34, 640), 2.201(28,601). Unit-cell results obtained by both methods are practically identical: Numanoite is monoclinic, space group $C2/m$, $a$ 17.799(2), $b$ 8.389(2), $c$ 4.451(2) Å, $\beta$ 102.49(3)°, $V$ 648.0(2) Å$^3$, and $Z = 2$. FTIR spectroscopy of numanoite shows strong absorption bands at 3540 and 3260 cm$^{-1}$ (O-H stretching), 1410, 870, and 290 cm$^{-1}$ (carbonate group) and at 1450, 1215, and 390 cm$^{-1}$ [B(O,OH)$_4$ tetrahedra]

Apart from chemical composition, all aspects of numanoite are very similar to that of boracite, Ca$_4$MgB$_4$O$_6$(OH)$_6$(CO$_3$)$_2$. Chemically the two minerals plot in distinct parts of Mg-Cu space with no overlap in composition. The authors suggest this gap is the result of either a miscibility gap or abrupt changes in fluid composition. Numanoite is likely formed by initial Cu rich hydrothermal fluids which later became Mg-rich and produced boracite.

The name is for Tadayuki Numano (1931–2001), Emeritus Professor of Okayama University. The type specimen is held at Department of Geology, National Science Museum, Tokyo, Japan, catalog no. NSM–M28813. **G.P.**

## TASSIEITE*

E.S. Grew, T. Armbruster, O. Medenbach, M.G. Yates, C.J. Carson (2007) TASSIEITE, (Na,☐)Ca$_2$(Mg,Fe$^{2+}$,Fe$^{3+}$)$_2$(Fe$^{3+}$, Mg)$_2$(Fe$^{2+}$,Mg)$_2$(PO$_4$)$_6$·2H$_2$O, a new hydrothermal wicksite-group mineral in fluorapatite nodules from granulite-facies paragneiss in the Larsemann Hills, Prydz Bay, East Antarctica. Can. Min., 45, 293–305.

The single occurrence of tassieite is as a secondary mineral in a nodule of fluoroapatite in a bioitite-quartz-plagioclase paragneiss. Other associated secondary minerals are magnetite, fluorapatite, mélanojosephite, cassiterite, and several Ca-Mg-Fe phosphates. Tassieite is dark green with a very light green streak and a vitreous luster. It is brittle, with two cleavages; good to perfect on {100} and one that intersects the first at 60°. Hardness and density could not be determined do to small sample size. Calculated density is 3.45 g/cm$^3$. In thin section tassieite is transparent. It is optically biaxial positive, $\alpha$ 1.712(2), $\beta$ 1.713(2), $\gamma$ 1.722(2) (589 nm), with $2V$ (meas.) = 46(1)°, $2V$ (calc.) = 37°. Dispersion is very weak. Pleochroism is strong, with $X$ dark blue, $Y$ blue, $Z$ light brown; the absorption is $X > Y >> Z$. Fluorescence was not observed.

Chemical compositions were determined using electron microprobe; A representative composition is SiO$_2$ 0.01, P$_2$O$_5$ 44.54, SO$_3$ 0.06, MgO 10.95, MnO 0.38, FeO 25.40 (meas.), FeO 14.93 (calc.), Fe$_2$O$_3$ 11.63 (calc.), Na$_2$O 1.96, CaO 11.56, SrO 0.02, Y$_2$O$_3$ 0.26, Ce$_2$O$_3$ 0.08, Yb$_2$O$_3$ 0.13, UO$_2$ 0.04, F 0.04, H$_2$O 3.78 (calc.), sum 100.34 wt% (excluding F). An empirical formula for this data is: Na$_{0.60}$Ca$_{1.96}$Mg$_{2.59}$Mn$_{0.05}$Fe$^{2+}_{1.98}$Fe$^{3+}_{1.39}$Y$_{0.02}$ Yb$_{0.01}$S$_{0.01}$P$_{5.98}$O$_{24}$·2H$_2$O for 14 cations excluding Na, and 24 O. The main compositional variations are accounted for by Mg-Fe substitution and by $^{Na}$☐$+$ $^{M1,M2}$Fe$^{3+}$ = $^{Na}$Na $+$ $^{M1,M2}$(Mg,Fe$^{2+}$). These substitutions show no correlation.

A powder diffraction pattern obtained with a Gandalfi camera and Cu$K\alpha$ radiation produced the following indexed lines

6.40(5)(002), 3.497(40)(302), 3.000(80)(114), 2.895(80)(040), 2.735(100)(420,412), 2.545(10)(224), and 2.091(30)(106). Cell dimensions were refined from data collected with graphite monochromated

Mo$K\alpha$ radiation on an ENRAF NONIUS CAD4 diffractometer equipped with a point detector. Tassieite is orthorhombic *Pbca* with *a* 12.4595(7), *b* 11.5955(16), *c* 12.7504(7) Å, *V* 1842.1(3) Å$^3$, calculated density 3.45 g/cm$^3$, *Z* = 4. Structure refinement was carried out on two crystals using a three circle SMART BRUKER CCD 1K with graphite-monochromated Mo$K\alpha$ radiation. The refinement shows that tassieite is isostructural with wicksite and bederite, but in the case of tassieite, the M1 site is predominantly occupied by Mg. The authors propose tassieite as a third member of the wicksite group on the basis of the predominance of Mg in the M1 site and suggest that a potential fourth member may be defined in the future on the basis of the dominance of Na vs. vacancy in the Na site

Tassieite is named for Tassie Tarn; a nearby lake. Holotype material is deposited as catalog no. NMNH 174436, at the National Museum of Natural history (Smithsonian Institution). **G.P.**

## DISCREDITED MINERALS

### NATROMONTEBRASITE

A-M. Fransolet, F. Fontan, P. de Parseval (2007) Natromontebrasite, a discredited mineral species. Can. Min., 45, 391–396.

Natromontebrasite, (Na,Li)AlPO$_4$(OH,F), has been shown, by X-diffraction and electron microprobe to be a mixture of an OH-rich amblygonite and lacroixite, with subordinate quantities of wardite. This discreditation has been approved by the IMA Commission on New Minerals and Mineral Names. **P.C.P.**