

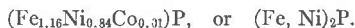
NEW MINERAL NAMES

MICHAEL FLEISCHER

Barringerite

P. R. BUSECK (1969) Phosphide from meteorites: Barringerite, a new iron-nickel mineral. *Science* 165, 169-171.

The average of microprobe analyses was Fe 44.3 ± 0.9 , Ni 33.9 ± 0.7 , Co 0.25 ± 0.03 , P 21.8 ± 0.4 , sum 100.25%, corresponding to



X-ray study shows it to be hexagonal, space group $P\bar{6}2m$, a 5.87 ± 0.07 , c 3.44 ± 0.04 Å. The strongest X-ray lines (including many overlapping troilite or schreibersite; those starred do not overlap) are 2.98 (110), 2.85* (101), 2.53(200), 2.23(111), 2.03*(201), 1.88* (120), 1.72(100), 1.68(300, 121), 1.48(220), 1.41(310, 221), 1.29*(311), 1.28(122), 1.27 (400), 1.205(302), 1.197(401). The structure is similar to those of synthetic Fe_2P and Ni_2P . ρ (calc) 6.92.

Color white, very similar to that of kamacite, bluish compared to schreibersite. Harder than either kamacite or schreibersite. Reflectivity in air and oil slightly higher than that of schreibersite, lower than that of kamacite. Noticeably anisotropic (white to blue). Bireflectance not observed.

The mineral occurs as bands 10-15 μm wide and several hundred microns long; they consist of individual grains less than 1 μm in diameter. They occur in the Ollague pallasite along the contacts between schreibersite and troilite.

The name is for D. M. Barringer, "the early and avid defender of the meteorite origin of the Barringer or Meteor crater."

The mineral and name were approved before publication by the Commission on New Minerals and Mineral Names, IMA.

Godlevskite

E. A. KULAGOV, T. L. EVSTIGNEEVA, AND O. E. YUSHKO-ZAKHAROVA (1969) The new nickel sulfide godlevskite. *Geol. Rud. Mestorozhd.* 11, 115-121 [in Russian].

Analysis by microprobe gave Ni 61.5 ± 0.5 , Fe 3.0 ± 0.1 , Co 0.6 ± 0.05 , S 35.0 ± 0.5 , sum 100.1% (average of 5, with standards of pure Ni, Fe, and Co, and PbS (for S)). This is close to (Ni, Fe, Co)S(metal/S=1.02), but the X-ray data show that it is actually Ni_7S_6 , corresponding to the β - Ni_7S_6 synthesized by Kullerud and Yund [*J. Petrology* 3 (1962)].

The strongest lines of the mineral (57 lines given) are 3.28 (5)(131), 2.85 (10)(222), 2.10 (5)(204), 1.803 (9)(044), 1.795 (8)(025), 1.654 (8)(530). An oscillation photograph showed it to be orthorhombic, space group $C222$, $Cm2m$, $Cmm2$, or $Cmmm$, a 9.180, b 11.263, c 9.457 (± 0.003) Å. Twinning is common and often complex, sometimes forming "elbow" bends.

The mineral occurs as aggregates and single grains up to 1 mm., but rarely more than 0.3 mm. in size. Under the reflecting microscope the color is pale yellow with weak birefringence in shades of yellow. Anisotropy strong with color effects from bluish to reddish. Reflectivity, with silicon and pyrite standards, is given at 9 wave lengths from 440 to 740 nm: at 440, 32.8, 37.7; at 540 48.7, 49.5; at 620 52.4, 51.2; at 740 56.4, 54.4; *i.e.* the optical sign changes between 560 and 620. The reflectivity of millerite is similar but the change in optical sign is at 450 nm. Heazlewoodite has higher reflectivity and does not change sign. Microhardness 383-418, av. 397 kg/sq. mm. (40-50 g. load, higher than for millerite or heazlewoodite.

The mineral occurs in bornite and bornite-chalcopyrite veins of the Noril'sk deposit and the Talnakh deposit, USSR. It is replaced in part by bornite and by millerite and has been observed replacing pentlandite.

The name is for M. N. Godlevskii, Russian economic geologist. Samples are preserved at the Mineralogical Museum, Acad. Sci. USSR, and the Institute of Geology, Moscow. The mineral and name were approved before publication by the Commission on New Minerals and Mineral Names, IMA.

Tazheranite

A. A. KONEV, Z. F. USHCHAPOVSKAYA, A. A. KASHAEV, AND V. S. LEEBEDEVA (1969)
Tazheranite, a new calcium-titanium-zirconium mineral. *Dokl. Akad. Nauk SSSR*, 186, 917-920 [in Russian].

Analysis by V. S. L. of a sample of 0.3 g. containing 5.4% spinel and 1.5% forsterite gave ZrO₂ 67.67, TiO₂ 2.42, Ti₂O₃ 11.65, CaO 9.97, Fe₂O₃ 0.92, Al₂O₃ 4.61, MgO 2.38, SiO₂ 0.63, sum 100.25%. Spectrographic analysis showed up to 1% Hf, 0.1% Nb and Pb, and 0.03% Sn. Recalculation gives for the unit cell content:



This is therefore, the cubic modification of ZrO₂ stabilized by the presence of oxides in solid solution, but has a defect structure.

X-ray study showed the mineral to be cubic, a 5.108 ± 0.001 Å, possible space groups *Fm3m*, *F43*, *F43c*. The strongest X-ray lines (12 given) are 2.94 (10)(111), 2.55 (6)(200), 1.804 (10)(220), 1.539 (10)(311), 1.474 (4)(222), 1.277 (4)(400), 1.171 (5)(331), 1.142 (420)(4), 1.044 (5)(422), 0.983 (5)(333, 511), 0.864 (4)(531). Heating to 1100° caused a change of a to 5.07 Å.

The mineral is usually yellowish-orange to reddish-orange, rarely cherry-red. Luster adamantine to greasy. H . 7.5, brittle, no cleavage. ρ 5.01 ± 0.02 (pycnometer). Nonmagnetic. Does not luminesce in ultraviolet. In section yellowish, sometimes with a reddish tint, isotropic, n 2.35 ± 0.02 (in Se-S melts), but shows weak to strong anisotropy in the central parts of grains.

The mineral occurs as irregular grains and as rounded or thick tabular isometric crystals 0.01-0.2, rarely up to 1.5 mm., some with perfect faces. It occurs in calciphyres which form bands in periclase-brucite marbles within the alkalic and nepheline syenites of the Tazheran alkalic massif, west of Lake Baikal, Siberia. Associated minerals are calcite, dolomite, spinel, forsterite, pyrrhotite, melilite, clinohumite, ludwigite, magnesioferrite, calzirtite, baddeleyite, geikielite, perovskite, rutile, and zircon. Overgrowths of tazheranite on calzirtite were observed.

The name is for the massif. The mineral and name were approved before publication by the Commission in New Minerals and Mineral Names, IMA.

DISCUSSION.—This is very similar in composition to calzirtite [*Amer. Mineral.* 46, 1515 (1961)]. The latter is tetragonal and the X-ray pattern shows superstructure lines, whereas Laue and Weissenberg photographs of tazheranite show no deviations from cubic symmetry.

Wolframoixiolite

A. L. GINZBURG, S. A. GORZHEVSKAYA, G. A. SIDORENKO, AND T. A. UKHINA (1969)
Wolframoixiolite—a variety of ixiolite. *Zap. Vses. Mineral. Obshch.* 98, 63-73 [in Russian].

Chemical analysis of a mineral from an unknown locality, now in the Fersman Mineralogical Museum of the Academy of Sciences, U.S.S.R., gave (after correcting for about 3% admixed ilmenite and microcline, and recalculating to 100%): Nb₂O₅ 24.80, Ta₂O₅ 7.81, WO₃ 37.13, MnO 7.44, rare earths 0.16, UO₂ 5.28, CaO 0.56, MgO 0.21, TiO₂ 0.26, FeO

10.09, SrO 0.01, ThO₂ 0.46, ZrO₂ 2.74, H₂O⁻ 0.39, H₂O⁺ 2.62, F 0.04; sum 100.00%. This corresponds to (Nb_{0.54}Ta_{0.10}W_{0.46}Ti_{0.01}Fe_{0.40}Zr_{0.06}Mn_{0.30}U_{0.05}Ca_{0.03}Mg_{0.02})O₄·0.84H₂O = (Nb, Ta, W, Ti, Fe, Zr, Mn, U, Ca, Mg)_{1.97}O₄·0.84H₂O.

The strongest X-ray diffraction lines are 3.641 (7), 2.963 (10), 2.485 (6), 1.768 (6), 1.716 (7), 1.461 (6) and 1.451 (6). The powder pattern has been indexed on a monoclinic cell (*P2/c*), with $a = 4.750$, $b = 5.72$ and $c = 5.06$ Å, (β not given, but presumably 90°); $Z = 2$. The diffraction lines at higher Bragg angles are broad and weak, suggesting partial disordering. On heating at 1000°C, a mixed pattern corresponding to columbite and UTa₂O₆ is obtained.

The mineral occurs as prismatic grains, up to 0.22 mm in diameter, intergrown with microcline, quartz, ilmenite and fluorite. Crystals in microcline are surrounded by dark red and brown aureoles. Wolframioxiolite is black with a gray tint, opaque to transmitted light, and occasionally exhibits a brownish-red tint under the binocular microscope. It has one well-developed prismatic cleavage, and a poorer one nearly perpendicular to the first. Measured specific gravity (after correction for admixed microcline and ilmenite) is 6.55; calculated, 6.712. Microhardness under a 50 g load, is 412 kg/mm². Specific magnetic susceptibility is 24.6×10^{-6} cm³/g, and dielectric permeability is 12.75. In reflected light, the mineral is anisotropic and weakly birefracting, with a reflectivity of 18.08% parallel to the cleavage direction. Internal reflections are seen in oil immersion. DTA curves show an endothermic reaction at 150° and an exothermic reaction at 450°. The mineral is strongly radioactive.

The name is for its composition and structure, which show similarities to both wolframite and ixiolite.

DISCUSSION.—The chemical formula inferred from the analysis indicates a closer similarity to ixiolite, which has a disordered cation distribution, than to the more highly ordered wolframite. The powder pattern, however, contains some lines that are incompatible with the ixiolite space group, and therefore the authors presumably chose to index their pattern on a monoclinic cell similar to that of wolframite. There is no obvious reason, from the powder data alone, why a monoclinic unit cell should have been given preference over an orthorhombic unit cell with the appropriate extinction conditions. A complete crystallographic characterization by single-crystal diffraction methods would therefore be highly desirable.

F. H. Nickel

Eveite

PAUL B. MOORE (1968) Eveite, Mn₂(OH)(AsO₄), a new mineral from Långban. *Arkiv Min. Geol.* 4, 473–476.

Eveite is an open-fissure mineral occurring as apple-green tabular or sheaflike crystals encrusting cavities and fractures in hausmannite, Fe-Mn oxides and carbonates.

Physical properties of eveite are: streak white, density 3.76 gm/cc., hardness 4-, cleavage fair {101}. It is easily and completely soluble in cold 1:1 HCl giving a colorless solution.

The formula is based on microprobe analysis following spectrographic examination and supported by analogy with the formulas of related minerals.

Eveite is biaxial (+), $\alpha = 1.700 \pm .005$, $\beta = 1.715 \pm .005$, $\gamma = 1.732 \pm .01$, $2V(\text{obs}) = 65^\circ \pm 5^\circ$, $r > v$ medium.

Eveite is isostructural with and has a similar crystal habit to adamite, Zn₂(OH)(AsO₄), and this determined the choice of name. The space group is *Pnmm*, a 8.57, b 8.77, c 6.27 (all $\pm .01$ Å), $Z = 4$. The strongest lines in the indexed powder pattern are 4.39 (10), 3.058 (9), 5.09 (8), 6.10 (7), 2.528 (5). Eveite is a dimorph of sarkinite which is far more dense and is also found at Långban but in different association suggesting higher pressure.

The mineral has been approved by the Commission on New Minerals and New Mineral Names, I.M.A. The type specimen, NRMS 390274, is preserved in the collections of the Swedish Natural History Museum.

A. Pabst

Melkovite

B. L. EGOROV, A. D. DARA, AND V. M. SENDEROVA (1969) Melkovite, a new phosphate-molybdate from the zone of oxidation. *Zap. Vses. Mineral. Obsch.* 98, 207–212 [in Russian].

Analysis by V.M.S. gave P_2O_5 7.86, MoO_3 57.17, Fe_2O_3 10.90, CaO 5.15, Na_2O 1.12, K_2O 0.28, H_2O 16.59, ZrO_2 0.97, sum 100.04%. The Zr was found not to be in the mineral and was omitted from calculation. This gives



or approximately $CaFeH_6(MoO_4)_4(PO_4) \cdot 6H_2O$. [Compare betpakdalite, *Amer. Mineral.* 47, 172 (1963)]. Spectrographic analysis also showed Al, Ti, Si, Mg, o.X%; Ba, V, Ir, Pb, Mn, 0.0%. In the blowpipe flame, swells and melts to a pale gray button. Readily dissolved by dilute acids. The DTA curve shows an endothermic effect with double maximum at 210–250°, an exothermic effect with double maxima at 480° and 550°, and a weak endothermic effect at 870° (fusion). The infra-red absorption spectrum shows bands corresponding to $(MoO_4)^{-2}$ and $(PO_4)^{-3}$.

X-ray powder data are given (45 lines). The strongest lines are 8.42 (7), 3.537 (8), 3.036 (7), 2.916 (9), 2.415 (5), 1.992 (6), 1.789 (7), 1.543 (5), 1.507 (5). The pattern was unchanged at 100°, but at 200° and 300° the mineral gave no X-ray pattern. At 500° and 800° lines of MoO_3 and $CaMoO_4$ were found.

The mineral occurs as finely crystalline powdery films and veinlets consisting of platy crystals generally 0.001–0.002 mm in diameter. Color lemon-yellow to brownish yellow, luster dull to waxy. *H.* about 3, brittle. One perfect cleavage. ρ (suspension) 2.971 ± 0.002 . The pH of a suspension of the mineral was 5.0–5.1. Under the microscope shows a greenish tint. Extinction undulatory, nearly parallel in sections perpendicular to the cleavage. Mean $n = 1.838$. Pleochroism weak, from colorless to pale greenish. The interference color is abnormal blue.

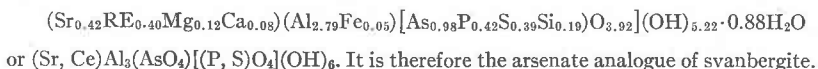
The mineral occurs in the zone of oxidation of molybdenite-fluorite deposit in the Shunak Mts., central Kazakhstan, associated with hydrous iron oxides, powellite, iriginite, ferrimolybdate, jarosite, and autunite.

The name is for the Russian mineralogist Vyacheslav Gavrilovich Melkov. Type material is preserved in the Mineralogical Museum Acad. Sci. USSR, Moscow. The mineral and name were approved before publication by the Commission on New Minerals and Mineral Names, IMA.

Kemmlitzite

J. HAK, Z. JOHAN, M. KUACEK, AND W. LIEBSCHER (1969) Kemmlitzite, a new mineral of the woodhouseite group. *Neues Jahrb. Mineral., Monatsh.* 1969, 201–212.

Analysis gave As_2O_5 21.57, P_2O_5 5.69, SO_3 5.99, SrO 8.27, RE_2O_3 (computed as Ce_2O_3) 12.60, CaO 0.90, MgO 0.90, Al_2O_3 27.24, Fe_2O_3 0.78, SiO_2 2.18, H_2O 12.04, total 98.16%. The rare earths were composed of Ce_2O_3 57.00, La_2O_3 26.35, Nd_2O_3 15.77, Sm_2O_3 0.88, Eu, Th traces. Spectrographic analysis showed in the 0.0X% range B, Ba, Pb, Ti, Tl, Ga, with traces of many other elements. This gives the formula:



Infra-red absorption curves show bands characteristic of sulfate, phosphate, arsenate, hydroxyl, and water. DTA shows a large endothermic break at 710–730° and a smaller one at 1020°. Very resistant to mineral acids.

X-ray study showed the mineral to be rhombohedral, a 7.072 ± 0.001, c 16.51 ± 0.01 Å, c/a = 2.349, Z = 3, or a_{rh} = 6.837 Å, α 61°51', Z = 1. X-ray powder data are given (28 lines); the strongest are 5.71 (7)(10 $\bar{1}$ 1), 3.514 (9)(1120), 2.959 (10)(1123), 2.751 (5)(0006), 2.203 (8)(10 $\bar{1}$ 7), 1.903 (9)(3033), 1.757 (8)(2240), 1.635 (5b)(3036), 1.456 (5)(01 $\bar{1}$.11), 1.292 (6)(14 $\bar{3}$ 3). Heating to 1000° gave an unidentified X-ray pattern.

The mineral occurs in pseudo-cubic rhombohedral crystals with average rhombohedron edge 0.1–0.15 mm. The basal pinacoid is rarely present. Color light grayish-brown, partly colorless, and partly cloudy brownish with zonal structure. Cleavage basal, "very little pronounced". H . 5.5, ρ 3.63 observed, 3.601 calcd. Optically uniaxial, positive, n_s (Na) ω 1.701, ϵ 1.707, both ± 0.001.

The mineral was found in the heavy fraction separated from kaolinized quartz porphyry from the Kemmlitz deposit, Saxony, East Germany. Associated heavy minerals are listed: zircon, anatase, and apatite are most abundant.

The name is for the locality. Type material is preserved in the National Museum, Prague (no. 52508). The mineral and name were approved in advance of publication by the Commission on New Minerals and Mineral Names, IMA.

DISCUSSION.—The name is to be used for all compositions with these anions and Sr predominant among the cations. The analyzed material is a cerian kemmlitzite.

Hydroglauberite

M. N. SLYUSAREVA (1969) Hydroglauberite, a new mineral of the hydrous sulfate group. *Zap. Vses. Mineral. Obshch.* 98, 59–62 [in Russian].

Analyses by E. F. Kasyanova and N. V. Ershova gave resp., SO₃ 52.16, 52.27; Cl 0.58, 0.74; Na₂O 25.40, 24.39; K₂O 0.19, 0.08; CaO 13.59, 13.64; MgO none, none; H₂O 8.20, 8.00; not detd. none, 0.26, total 100.12, 99.38%, corresponding closely to 5Na₂SO₄ 3CaSO₄ 6H₂O. Spectrographic analysis showed the presence of Sr in amounts up to 0.1%, with traces of Ti and Mg. DTA curves showed a sharp endothermic effect between 100° and 200° (loss of water) and a weaker one between 500° and 600° (decomposition of double sulfate).

X-ray powder data are given (51 lines). The strongest lines are 9.2 (9), 4.6 (8), 4.2 (6); 3.83 (5), 3.52 (6), 3.08 (10), 2.90 (7), 2.78 (9b), 2.25 (6), 2.00 (5), 1.879 (5). Probably orthorhombic, from the optical properties.

The mineral forms dense, snow-white masses. Luster silky. Under the microscope it is seen to consist of fibers not more than 0.1 mm in size. ρ 1.510. Taste salty, slightly bitter. Decomposed by H₂O with formation of gypsum, easily dissolved by dilute HCl. Optically biaxial, negative, $2V$ not stated, extinction parallel, elongation positive, n_s , α' 1.488, γ' 1.500. Forms elongated tablets, lying on the plane of the best cleavage; 2 additional cleavages were noted, one distinct, one as striations parallel to the elongation.

The mineral occurs in Tertiary sediments in the Karakalpakii ASSR as an alteration product of glauberite, which is associated with halite, astrakhanite, mirabilite, and polyhalite.

The name is for the composition. The mineral and name were approved before publication by the Commission on New Minerals and Mineral Names, IMA.

Mukhinite

A. B. SHEPEL AND M. V. KARPENKO (1969) Mukhinite, a new variety of epidote. *Dokl. Akad. Nauk SSSR* 185, 1342–1345 [in Russian].

Microchemical analysis by A. A. Ivanova on a sample containing about 2% sphalerite gave SiO_2 36.50, Al_2O_3 21.81, V_2O_5 11.29, Fe_2O_3 1.31, Cr_2O_3 0.28, CaO 22.23, S 0.98, H_2O 1.76, sum 96.16%, to which should be added about 2% ZnO (as calculated from S). Spectrographic analysis showed also Mg 0.03, Mn 0.05, Cu 0.003, Ti 0.03, Sr 0.02, Ba 0.01, and traces of Pb and Yb. This corresponds to $\text{Ca}_{2.0}(\text{Al}_{2.1}\text{V}_{0.8}\text{Fe}_{0.1})\text{Si}_{3.1}\text{O}_{12.0}(\text{OH})$, i.e., to a clinozoisite with one-third the Al replaced by V.

The mineral is difficultly soluble in acids, but is dissolved by H_2SO_4 after having been fused. The DTA curve shows an indistinct endothermic break at 250–300° and a strong one beginning at 820° with a peak at 970°.

The strongest X-ray lines (47 lines, unfiltered Fe radiation) were indexed by analogy with clinozoisite and epidote. The strongest lines are 2.892 (10)(11 $\bar{3}$), 2.682 (8)(021), 2.600 (8)(311), 2.530 (7)(103, 202), 2.398 (8)(31 $\bar{3}$), 1.638 (7)(132), 1.405 (8)(121), 1.394 (8)(31 $\bar{3}$). Single crystal study could not be made for lack of suitable crystals.

Mukhinite occurs as irregular grains up to 5 mm. in diameter and as irregular, short prismatic crystals up to 1×2.5 mm. Color black with a brownish tint, streak pale brownish-gray, luster vitreous. Microhardness 1375 kg/sq. mm. (=8, Mohs). ρ not given. Brittle. Cleavage {001} very perfect, {100} less so; angle between cleavages 64°. Some crystals are twinned on {100}. Optically biaxial, positive, $2V$ 88° (measured), $n_s \alpha$ 1.723, β 1.733, 1.755 (all ± 0.002), $Y=b$, Z $a=32^\circ$. Strongly pleochroic with X pale olive-green, Y pale reddish-brown, Z reddish-brown.

The mineral occurs in marble from the roof of the Tashelginsk iron ore deposit, Gornaya Shoriya, western Siberia, associated with goldmanite in areas of marble enriched in pale green muscovite and disseminated pyrite, pyrrhotite, chalcopyrite, and sphalerite.

The name is for A. S. Mukhin, geologist of the Western Siberia Geological Administration. Type material is preserved in the Mineralogical Museum, Acad. Sci. USSR, Moscow. The mineral and name were approved before publication by the Commission on New Minerals and Mineral Names, IMA.

DISCUSSION.—I would have voted against the name and called it vanadian clinozoisite, because $\text{Al} > \text{V}$. However, the names epidote and piemontite are used for many samples with $\text{Al} > \text{Fe}$ and $\text{Al} > \text{Mn}$, respectively.

Roggianite

E. PASSAGLIA (1969) Roggianite, a new silicate mineral. *Clay Miner.* 8, 107–111.

J. A. GARD (1969) An electron microscope and diffraction study of roggianite. *Clay Miner.* 8, 112–113.

Analysis on 200 mg that contained small amounts of an unknown organic contaminant gave SiO_2 36.58, Al_2O_3 22.34, Fe_2O_3 0.42, MgO 0.87, CaO 14.73, Na_2O 0.94, K_2O 0.76, H_2O^- 4.49, H_2O^+ 17.14, SO_3 0.32, F 0.10, Cl 0.05, H 0.19, C 1.43, P_2O_5 none. CO_2 none, Mn, Ti traces, sum 100.36-(O=F₂, Cl₂ 0.05)=100.31%. Assuming O=92, this gives the formula:



or approximately



The DTA curve gives a small endothermic peak at 113°, a broad exothermic reaction at 200–500° (peak 361°), a sharp endothermic peak at 874°, and a sharp exothermic peak at 910°C. Only 0.62% H_2O was lost between 110° and 650°.

Rotation photographs gave a tetragonal cell, with a 18.37 ± 0.07 , c 9.14 ± 0.04 Å (fiber axis). The strongest X-ray lines (32 given) are 13.08 (vs) (110), 9.27 (s)(200), 6.13 (s)(211),

3.60 (ms)(510, 312), 3.41 (ms)(431). The X-ray pattern is not changed at 650° or by treatment with glycerol. Possible space groups are $I4cm$, $I4c2$, $I4/mcm$.

The mineral occurs as whitish-yellow fibrous aggregates. Electron microscope photographs show the fibers to be long laths about 70–600 nm wide and 40–120 nm thick. Elongation c ; cleavage {110} perfect. ρ 2.02 (certainly too low), optically uniaxial, positive, α 1.527, ϵ 1.535 (both ± 0.001). The mineral occurs coating fractures in a sodium feldspar dike cutting gneiss at Alpa Rosso, Val Vigezzo, Novara Prov., Italy.

The name is for Aldo G. Roggiani, teacher of natural sciences, who first found the mineral.

The mineral was approved in advance of publication by the Commission on New Minerals and Mineral Names, IMA.

Parwelite

PAUL B. MOORE (1968) Parwelite, $(Mn, Mg)_8Sb(Si, As)_2O_{10-11}$, a new mineral from Långban. *Arkiv Min. Geol.* 4, 467–472.

Parwelite has been identified in over a dozen specimens in the Långban collection of the Swedish Natural History Museum. It occurs as yellowish-brown stubby prismatic crystals with långbanite, spessartine, hausmannite, berzeliite, and caryinite in manganoan carbonate.

Parwelite in broken fragments is transparent tan, often cloudy. Its density is 4.62 gm/cc., hardness $5\frac{1}{2}$, cleavage poor to fair {010}, subconchoidal fracture. It is insoluble in cold 1:1 HCl solution.

Wet chemical analysis by Dr. Alexander Parwel, later partly confirmed by microprobe, gave MnO 44.30, FeO 0.05, PbO 0.40, CaO 1.50, MgO 4.50, Sb₂O₃ 20.01, As₂O₃ 22.02, SiO₂ 7.01, total 99.79 wt %, the valences being assigned to give the "best fit."

Parwelite is biaxial +, $\alpha, \beta = 1.85 \pm .01$, $\gamma = 1.88 \pm .01$, $2V = 27^\circ \pm 3^\circ$, dispersion is strong $r > v$. The optical orientation remains undetermined.

Both powder and single crystal X-ray data are reported. The space group is given as $I2/m$ or $I2$. It is not stated how Im was excluded. Cell dimensions are a 9.76 Å, b 19.32, c 10.06, β $95^\circ 54'$, $Z = 8$. There is a marked subcell with all cell edges halved. The strongest lines in the powder pattern are 2.734 (10), 2.915 ($9\frac{1}{2}$), 4.84 (5), 3.411 (5), 2.422 (4).

The mineral is named after its analyst, chemist at the Swedish Natural History Museum, where the type specimen is NRMS26758. The new mineral has been approved by the Commission on New Minerals and New Mineral Names, I.M.A.

A. Pabst

NEW DATA

Welinite

PAUL B. MOORE (1968) The crystal structure of welinite, $(Mn^{+4}, W)_{<1}(Mn^{+2}, W, Mg)_{<3}Si_7Si(O, OH)_7$. *Arkiv Min. Geol.* 4, 459–466.

The formula originally suggested by Moore {*Arkiv Min. Geol.* 4, 407–411 (1967) [*Amer. Mineral.* 53, 1084 (1968)]} is modified to the form given in the title. This is based on site occupancy results obtained in connection with the crystal structure determination. The structure found is in the space group $P6_3$, $Z = 2$, ρ (obs) is 4.47, (calc) 4.41.

A. Pabst