

NEW MINERAL NAMES

Picotpaulite

ZDENEK JOHAN, ROLAND PIERROT, HENRI-JEAN SCHUBNEL, and FRANCOIS PERMINGEAT (1970) La picotpaulite, $TlFe_2S_8$, une nouvelle espèce minérale. *Bull. Soc. Franc. Mineral. Cristallogr.* 93, 545-549.

Microprobe analyses by R. Giraud gave Tl 46.8, 47.8; Pb 2.8, 1.8; Fe 28.6, 28.2; S 24.1, 23.9; sum 102.3, 101.8%, corresponding closely to $(Tl, Pb)Fe_2S_8$.

Rotation and Weissenberg photographs showed the mineral to be orthorhombic, mmC —, possible space groups $C 222$, $C mm2$, $A mm2$, $Cmmm$, $a 5.40 \pm 0.02$, $b 10.72 \pm 0.05$, $c 9.04 \pm 0.04\text{\AA}$, $a:b:c = 0.504:1:0.844$, $Z = 4$, G . calcd. 5.20. The strongest X-ray lines (19 given) are 5.40 (5)(100), 4.53 (5)(002), 4.26 (9)(111), 3.80 (7)(120), 3.33 (7)(031), 2.912 (10)(122,013), 2.556 (5)(113), 2.513 (5)(211), 2.410 (5)(220), 1.748 (5)(053, 311), 1.730 (5)(044). Crystals are pseudo-hexagonal plates that are penetration twins on (120) or truncated bipyramidal; goniometric data are given for 10 forms.

In polished section creamy white, strongly anisotropic. Microhardness about 41 kg/sq. mm. (15 g. load). Reflections are given at 12 wave lengths: $R'g$ and $R'p$ are, resp., 460 nm, 32.4, 25.8; 540, 31.1, 24.3; 580, 32.0, 24.6; 640, 33.7, 25.6.

The mineral occurs at Allchar, Macedonia, Yugoslavia, in realgar and associated with pyrite lorandite, and ragninite; it is partially replaced by ragninite [*Amer. Mineral.* 54, 1495 (1969)]. Crystals do not exceed 0.5 mm. in size.

The name is for Paul Picot, Bur. Rech. Geol. Minieres, Orleans, France. The mineral and name were approved before publication by the Commission on New Minerals and Mineral Names, IMA. Type material (a few polished sections) are preserved at the Ecole Natl. Supérieure des Mines, Paris.

Pierrotite

CLAUDE GUILLEMIN, ZDENEK JOHAN, CLAUDE LAFORET, and APUL PICOTT (1970) La Pierrotite, $Tl_2(Sb,As)_{10}S_{17}$, une nouvelle espèce minérale. *Bull. Soc. Franc. Mineral. Cristallogr.* 93, 66-71.

Analyses (1-2 by electron microprobe by R. Giraud, 3 microchemical on 80 mg containing some stibnite and realgar, by J. Fritsche) gave Tl 19.9, 19.9, 12.4; Sb 44.9, 43.3, 51.1; As 8.8, 8.9, 9.0; S 26.4, 26.9, 27.2; sum 100.0, 99.0, 99.7% corresponding to $Tl_2(Sb, As)_{10}S_{17}$ with Sb:As = 3:1.

Rotation and Weissenberg photographs showed the mineral to be orthorhombic, space group $Pbn2$ or $Pbnm$, $a 8.77 \pm 0.03$, $b 38.8 \pm 0.01$, $c 8.03 \pm 0.03\text{\AA}$, $a:b:c = 0.226:1:0.207$, $Z = 4$, G . calcd. 4.97, measured 4.97. The strongest X-ray lines (41 given) are 3.63 (8)(260), 3.59 (10)(122), 3.49(9)(0.10.1), 2.84 (8)(1.12.1), 2.70 (9)(262), 2.347 (8)(322).

Color grayish-black, luster metallic, streak brownish-red. H. $3\frac{1}{2}$, microhardness 161 kg/sq.mm. (50 g. load). In polished sections white with red internal reflections. Anisotropy moderate, brownish-gray to greenish-gray. Reflectances are given at 12 wavelengths for $R'g$, $R'm$, $R'p$: 460 nm, 37.2, 36.3, 33.7; 580, 34.0, 33.1, 30.2; 640, 32.1, 31.4, 28.5%

The mineral occurs as polycrystalline aggregates in quartz veins at Jas-Roux, Hauts-Alpes, France, associated with stibnite, realgar, pyrite, and amorphous $Tl(As,Sb)_{10}S_{16}$.

The name is for Roland Pierrot, chief, Service mineralogique, Bur. Rech. Geol. Minieres, Orleans, France. The mineral and name were approved before publication by the Commission on New Minerals and Mineral Names, IMA. Type material is preserved at the Ecole Natl. Superieure des Mines, Paris.

Bukovite

ZDENEK JOHAN and MILAN KVACEK (1971) La bukovite, $Cu_{3+x}Tl_2FeSe_{4-x}$, une nouvelle el espèce minérale. *Bull. Soc. Fr. Mineral. Cristallogr.* 94, 529-533.

Electron microprobe analyses (1-3 by R. Giraud from Predborice, 4 by Z. Johan from Bukov) gave Se 31.3, 30.7, 32.2, 31.0; Cu 20.8, 21.8, 21.0, 20.3; Tl 42.2, 42.3, 42.2, 42.1; Fe 5.6, 6.0, 6.0, 6.0, sum 100.9, 100.8, 101.4 99.4%, giving ratios Cu:Tl:Fe:Se = 3.18:2.00:0.97:3.85, 3.28:1.98:1.02:3.72; 3.14:1.96:1.02:3.88; 3.12:2.01:1.04:3.83, or $Cu_{3+x}Tl_2FeSe_{4-x}$ with $X = 0.12-0.28$. Etch tests are given.

Rotation and Weissenberg photographs show the mineral to be tetragonal, possible space groups $I\bar{4}m2$, $I\bar{4}2m$, $I4mm$, $I4/mmm$, with a 3.976 ± 0.005 , c $13.70 \pm 0.02\text{\AA}$, c/a 3.447, $Z = 1$, G . calcd. 7.40. The strongest lines (18 given) are 2.998, 2.995 (10)(103), 2.600(9), 2.594 (7)(112), 2.255(7), 2.250 (5)(105); 1.987(7), 1.985 (6)(200); 1.771 (8), 1.770 (7)(116), 1.656(6), 1.653 (5)(213).

Color grayish-brown, luster metallic. In reflected light clear gray, weakly pleochroic from creamy gray to gray. Anisotropy medium. Polishes well. Reflectances are given at 12 wavelengths (420-640 nm): 460, 30.2, 26.8; 540, 29.2, 27.8; 580, 28.2, 27.4; 640, 26.2, 25.2%. Microhardness, 61 (10 g. load), 64 kg/sq.mm. (20 g. load) = Mohs 2. Cleavages {001} good, {100} imperfect.

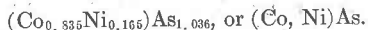
The mineral occurs in calcite veins at Bukov and Petrovice, western Bohemia, and at Predborice, central Bohemia, Czechoslovakia, associated with umangite, eskebornite, clausenthalite, eucairite, and other selenides.

The name is for the locality, Bukov. Type material is preserved at the Ecole Natl. Superieure des Mines, Paris, and at Charles Univ., Prague. The mineral and name were approved in advance of publication by the Commission on New Minerals and Mineral Names, IMA.

Langisite

W. PETRUK, D. C. HARRIS, AND J. M. STEWART (1969) Langisite, a new mineral, and the rare minerals cobalt pentlandite, siegenite, parkerite, and bravoite from the Langis mine, Cobalt-Gowganda area, Ontario. *Can. Mineral.* 9, 597-616.

Electron probe analysis by D.C.H. gave Co 35.5, Ni 7.0, As 56.0, sum 98.5%, corresponding to—



X-ray powder data show that it has the structure of nickeline (NiAs) and is indexed on a hexagonal cell with a 3.533, c 5.127Å. The strongest lines (14 given) are 2.631 (10)(101), 1.966 (9)(102), 1.770 (8)(110), 1.493 (4)(103).

The mineral is pinkish-buff in reflected light, very weakly birefringent, and moderately anisotropic with polarization colors ranging from bluish-gray to light brown. Microhardness 780-857, av. 825 kg/sq. mm. Max. and min. reflectances (av.) 470 nm, 46.4, 45.4; 546, 47.1, 46.4; 589, 48.2, 47.5; 650, 51.0, 49.9%.

The mineral occurs as irregular grains and lamellae in safflorite, associated with parkerite, cobalt pentlandite, and siegenite, in the Langis mine, Casey Township, Ontario. The name is for the mine. The mineral and name were approved before publication by the Commission on New Minerals and Mineral Names, IMA. Type material is in the National Mineral Collection, Ottawa.

Brüggenite

M. E. MROSE, G. E. ERICKSEN, AND J. W. MARINENKO (1971) Brüggenite, $\text{Ca}(\text{IO}_3)_2 \cdot \text{H}_2\text{O}$, a new saline mineral from the Chilean nitrate deposits. [abstr.]. *Program 20th Clay Minerals Conf., Aug. 1971*. 13.

Analysis, after deducting lautarite, gave CaO 14.1, SrO 0.4, I_2O_5 81.2, H_2O 4.1%, corresponding to the formula above, which was confirmed by analysis of synthetic material. Slightly soluble in water.

X-ray study showed it to be monoclinic, $P2_1/c$, a 8.505, b 10.000, c 7.498 Å., β 95°15', $Z = 4$, G . calcd. 4.267, measured 4.24. The strongest X-ray lines are 4.235 (50)(200), 3.232 (71)(220), 3.048 (100)(031), 2.992 (50)(022), 2.517 (50) ($\bar{2}31$), 1.746 (50)(412). The data on ASTM-1-0386 are for synthetic brüggenite, not lautarite.

Colorless to bright yellow, translucent to transparent, luster vitreous, $H. 3\frac{1}{2}$, brittle, fracture conchoidal. Optically biaxial, neg., n_s (Na) α 1.773, β 1.797, γ 1.814, $2V$ 88°, $Z = b$, $X \wedge a = 9^\circ$, elongation neg., $r > v$, moderate to strong.

The mineral occurs as long columnar, anhedral crystals intergrown with soda niter and as encrusting crystalline masses and short columnar crystals, in veins of fibrous soda niter at Pampa Pique III, Oficina Lauters, Chile. It is associated with lautarite.

The name is for Juan Brüggen M. (1887-1953), Chilean geologist. The mineral and name were approved in advance of publication by the Commission on New Minerals and Mineral Names, IMA. Type material will be deposited in the U. S. National Museum.

Zapatalite

S. A. WILLIAMS (1972) Zapatalite, a new mineral from Sonora, Mexico. *Mineral. Mag.* 38, 541-544.

Analyses by Schwarzkopf Microanalytical Laboratories on 9.385 mg. and 15.58 mg. gave CuO 27.92, 25.77; Al_2O_3 20.16, 20.26; P_2O_5 20.69, 22.51; H_2O^+ 15.46, 15.79; insol. (quartz and barite) 15.83, 15.54; $\text{As}_2\text{O}_5 < 0.03$, sum 100.06, 99.87%. A partial analysis on a sample of 7.42 mg. of greenish material gave insol. 6.37, Fe_2O_3 1.16, ZnO 0.25%. The analyses give $\text{CuO}:\text{Al}_2\text{O}_3:\text{P}_2\text{O}_5:\text{H}_2\text{O} = 7.2:4.1:3.0:17.6$ and 6.1:3.8:3.0:16.3, leading to the formula $\text{Cu}_5\text{Al}(\text{PO}_4)_3(\text{OH})_6 \cdot 4\text{H}_2\text{O}$. The mineral is readily dissolved by cold dilute HNO_3 and HCl , decomposed by 20% KOH .

No single crystals or undistorted crystal fragments were found. The strongest X-ray lines (43 given) are 11.601 (99)(001), 7.617 (100)(020), 6.817 (69)(120),

5.754 (73)(002), 4.584 (44)(022), 3.042 (48)(332, 050, 340), 2.951 (40)(051, 341), 2.882 (37)(004), 2.531 (45)(224, 252, 060). These lines were indexed by R. J. Davis on a tetragonal cell with a 15.223, c 11.518 Å., $Z = 6$, G . calcd. 3.017, measured 3.016 (Berman balance).

The mineral is pale blue (faience blue), streak similar but paler. $H. \sim 1\frac{1}{2}$, gummy or sectile when pressed by a needle. Cleavage basal, good. In section pale green, weakly dichroic, absorption $E > O$. Generally uniaxial, negative; some grains are biaxial, negative, $2V$ small to moderate; $ns \omega$ 1.646, ϵ 1.635.

The mineral occurs in a small prospect pit about 27 kms. SW of Agua Prieta, Sonora, Mexico, as massive poorly crystalline material filling cavities. It appears to have replaced libethenite and pseudomalachite and may in turn alter to chrysocolla. Chenevixite, alunite, beaverite, and other secondary minerals are present.

The name is for Emiliano Zapata (1879-1919), a popular hero of the Mexican Revolution. Type material is deposited at the British Museum of Natural History and the University of Arizona. The mineral and name were approved in advance of publication by the Commission on New Minerals and Mineral Names, IMA.

Roubaultite

FABIEN CESBRON, ROLAND PIERROT, AND THEODORE VERBEEK (1970) La roubaultite, $Cu_2(UO_2)_3(OH)_{10} \cdot 5H_2O$, une nouvelle espèce minérale. *Bull. Soc. Franc. Mineral. Cristallogr.* 93, 550-554.

Microprobe analysis by R. Giraud (H_2O on 4.72 mg) gave CuO 13.5, SeO_2 0.3, UO_3 71.6, H_2O 14.8, sum 100.2%, $CuO:UO_2:H_2O = 2:2.95:9.70$. About half the water is lost from 200-450°, the remainder at 500-550°. Fuses at 935°.

Rotation and Weissenberg photographs show it to be triclinic, $P1$ or $P\bar{1}$, a 7.73 ± 0.03 , b 6.87 ± 0.03 , c 10.87 ± 0.04 Å., α $86^\circ 29'$, β $134^\circ 12'$, γ $93^\circ 10'$ (all $\pm 20'$), $Z = 1$, G . 5.02 calcd. The strongest X-ray lines (32 given) are 7.74 (9)($\bar{1}01$), 6.88 (8)(010), 5.55 (10)(100), 3.500 (7)(101,20 $\bar{1}$), 3.448 (8) ($10\bar{3}$, $\bar{2}12$), 3.226 (8)($\bar{1}21$). Cleavage {100} perfect, also {010}.

The mineral occurs in rosettes about 3mm. in diameter of crystals platy on (100), grass-green to apple-green, luster brilliant to slightly greasy. $H.$ about 3. Optically biaxial, positive ns (Na) α' 1.700 ± 0.002 , β' 1.800 ± 0.004 , γ' between 1.82 and 1.83-1.84; dispersion curves are given. Pleochroic, X and Y colorless, Z yellow-green.

The mineral is known on a single sample from the zone of oxidation of the U deposit at Shinkolobwe, Katanga, on pitchblende, associated with becquerelite, vandenbrandeite, soddyite, and cuprosklodowskite.

The name is for Marcel Roubault, professor of geology, University of Nancy, France. The mineral and name were approved before publication by the Commission on New Minerals and Mineral Names, IMA. Type material is preserved at the Ecole Natl. Supérieure des Mines, Paris.

Derriksite

FABIEN CESBRON, ROLAND PIERROT, AND THEODORE VERBEEK (1971) La derriksite, $Cu_4(UO_2)(SeO_3)_2(OH)_6 \cdot H_2O$, une nouvelle espèce minérale. *Bull. Soc. Franc. Mineral. Cristallogr.* 94, 534-537.

Microprobe analysis by R. Giraud gave CuO 35.7, UO₃ 32.7, SeO₂ 24.9, H₂O 8.1, sum 101.4%, corresponding to 4CuO·UO₃·2SeO₂·4H₂O, or Cu₄(UO₂)(SeO₃)₂(OH)₆·H₂O. Thermogravimetric study on 5 mg indicated loss of 1 H₂O to 300°, loss of 3 more H₂O to about 350°, loss of 1 SeO₂ 350–450° and loss of a second SeO₂ 450–600°.

Weissenberg and precision photographs show derriksite to be orthorhombic, *P nmm* or *P nm2*, *a* 5.57 ± 0.01, *b* 19.07 ± 0.03, *c* 5.96 ± 0.01 Å, *Z* = 2, *G*. calcd. 4.72. The strongest X-ray lines (46 given) are 5.35 (ms)(100), 4.78 (vvs)(040), 4.352 (s)(031), 4.197 (ms)(130), 4.072 (vs)(101), 3.748 (vs)(121), 3.432 (ms)(131), 3.218(s)(051), 2.850 (ms)(022), 2.433 (ms)(132), 2.306 (ms)(142).

The mineral occurs in euhedral crystals not exceeding 0.7 mm. in size, elongated on [001], flattened on (100). Forms observed {010}, {100}, {110}, {121}. Cleavage {010}, very good. Color green to bottle-green. Optically biaxial, negative; β and γ could not be measured because of reaction with index liquids but are calcd. from reflectances at 420–700 nm.; at 520 nm, α 1.77, β' 1.85, γ' 1.89, *X* = *a*, *Y* = *b*, *Z* = *c*.

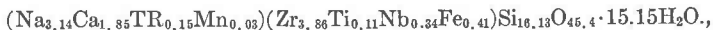
The mineral occurs in very small amount in the oxidation zone of the Cu–Co deposit of Musonoi, Katanga, as microcrystalline crusts on selenian digenite, also associated with chalcomenite and demesmaeckerite (*Amer. Mineral.* 51, 1815) on malachite.

The name is for Joseph Derriks, geologist, who studied the Shinkolobwe U deposits. Type material is preserved at the Univ. of Paris and the Ecole Natl. Supérieure des Mines, Paris. The mineral and name were approved before publication by the Comm. on New Minerals and Mineral Names, IMA.

Lemoynite

GUY PERRAULT, E. I. SEMENOV, A. V. BYKOVA, AND T. A. KAPITONOVA (1969) La lemoynite, un nouveau silicate hydrate de zirconium et de sodium de St. Hilaire, Quebec. *Can. Mineral.* 9, 585–596.

Analysis by A.V.B. gave SiO₂ 47.32, ZrO₂ 23.23, TiO₂ 0.43, Nb₂O₅ 2.18, Fe₂O₃ 1.61, MnO 0.10, CaO 5.06, TR₂O₃ 1.18, Na₂O 4.75, H₂O 13.33, sum 99.19%, corresponding to—



or



The infra-red absorption spectrum shows that both H₂O and hydroxyl groups are present. Most of the water is lost between 135 and 200°; the X-ray pattern is not changed after the mineral is heated at 200° for 24 hours.

Weissenberg and precession photographs show the mineral to be monoclinic, space group probably *C 2/m*, but perhaps *C 2* or *Cm*, *a* 10.48, *b* 16.20, *c* 9.07 Å, β 105°20', *Z* = 2, *G*. calcd. 2.26, measured 2.29. The strongest X-ray lines (54 given) are 9.0 (37)(001), 8.01 (100)(020), 3.562 (49)(221), 3.3034 (33)(132, 312), 2.807 (48)(242).

The mineral occurs as spherulites about 0.5 cm. in diameter, consisting of crystals about 0.05 mm. in size, showing {100} and {001}. Cleavages {100}, {010} perfect, {001} imperfect or parting. Color white, slightly yellowish, H.A. Optically biaxial, pos., 2*V* 80°, *ns* α 1.540, β 1.553, γ 1.570, *Y* = *b*, *Z* = *a* 5°.

The mineral occurs in cavities between large crystals of microcline in the pegmatites of the St. Hilaire alkalic massif, Quebec. The name is for Charles Lemoyne, 1625-1685, a prominent figure in the history of Canada, and his four sons. The mineral and name were approved before publication by the Commission on New Minerals and Mineral Names, IMA.

New Data

Lacroixite, Unnamed phosphate

M. E. ROSE (1971) Lacroixite: its redefinition and new occurrences [abstr.]. *Program 20th Clay Minerals Conf., Aug. 1971*, 10.

Re-examination of type lacroixite from Greifenstein, Saxony, shows that it is monoclinic, space group $A2/a$, a 6.89, b 8.22, c 6.425 Å, β 115°30'. It is the phosphate analogue of durangite and therefore has a formula of type $\text{NaAl}(\text{PO}_4)(\text{F}, \text{OH})$. The strongest X-ray lines are 3.159 (71)($\bar{2}11$), 2.900 (100)(002), 2.470 (85)(220), 2.168 (35)(131), 1.579 (30)($\bar{4}22$). The powder data on ASTM-13-0587, as well as the optical properties in the literature for lacroixite, are actually for an unnamed phosphate of unknown formula, which is monoclinic, $P2_1/m$ or $P2_1$, a 6.840, b 7.185, c 5.479 Å, β 109°10'.

Sogdianite

In *Amer. Mineral.* 54, 1221-1222 and 55, 1073, the name of the mineral sogdianite was misspelled sogdianovite. I regret the error.