

NEW MINERAL NAMES*

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Abelsonite*

A. PABST, P. A. ESTEP, E. J. DWORNIK, R. B. FINKELMAN AND C. MILTON (1975) Crystallized nickel porphyrin from the Green River Formation, Utah. *Geol. Soc. Am. Abstr. with Programs* 7, 1221-1222.

A nickel porphyrin ($C_{92}H_{36}N_4Ni$) has been found as tiny flakes in a fissure in drill core from depth 2507-2509 feet, Uintah County, Utah. "The chemical identity of the mineral was established by microprobe analysis for Ni and C, and by matching of visible and IR absorption spectra with those of synthetic Ni porphyrin."

Cell dimensions calculated by D. E. Appleman and those obtained from Weissenberg photographs gave, respectively, a 8.51, 8.44; b 11.18, 11.12; c 7.29, 7.28 Å; α 90°53', 90°53'; β 114°8', 113°45'; γ 79°59', 78°34'; $Z = 1$. Sp gr measured 1.45, calc 1.428, 1.448. Triclinic.

Color purple, luster adamantine. Very soft and fragile. Cleavage {111}. Pleochroic, deep brown parallel to elongation, opaque normal to elongation.

The name is for Dr. P. H. Abelson, president of the Carnegie Institution, Washington, a pioneer in organic geochemistry. M.F.

Althausite*

GUNNAR RAADE AND MAGNE TYSSSELAND (1975) Althausite, a new mineral from Odum, Norway. *Lithos*, 8, 215-219.

Analysis by B. Bruun was made on 1.32 g of hand-picked material from which most of the magnetite was removed by magnetic separation. The Ca present was in apatite, as confirmed by probe analysis of pure material. Analysis: P_2O_5 43.59, MgO 45.38, MnO 0.07, CaO 4.50, Na_2O 0.22, Al_2O_3 0.53, Fe_2O_3 1.37, SiO_2 0.11, F 2.86, Cl 0.19, H_2O^+ 1.87, H_2O^- 0.07 = 100.76 - (O = F_2, Cl_2) 1.24 = 99.52%. After deducting apatite, this gives $Mg_{2.07}(PO_4)_{1.04}(OH_{0.98}F_{0.28}O_{0.19})$, or $Mg_2(PO_4)(OH, F, O)$. The infra-red spectrum shows the presence of OH and PO_4 groups. The DTA and TGA curves show that dehydration proceeds rapidly at 70-460°, and continues at a slower rate to 710°. Small endothermic peaks were noted at 385° and 877°.

Oscillation and Weissenberg study showed althausite to be orthorhombic, space group $Pna2_1$, a 8.258, b 14.383, c 6.054 Å, $Z = 8$, sp gr calc 2.91, measured 2.97. The strongest X-ray lines (41 given) are 3.593 100 040, 3.316 90 211, 3.024 80 002, 2.786 60 211, 2.641 60 122.

Color gray (from magnetite inclusions), luster vitreous. H 3 1/2 on b , 4 on a . Cleavages {001} perfect, {101} distinct. Optically biaxial, positive, refr. ind. (white light) α 1.588, β 1.592, γ 1.598, $2V \sim 70^\circ$ est, 78.5° calc, $X = b$, $Y = c$, elongation negative.

The mineral occurs in cleavable masses up to several hundred grams in serpentine-magnetite deposits at Modum, Norway, closely associated with apatite and an unidentified Ca-Mg phos-

phate. It contains inclusions of magnetite and xenotime and is partly altered to apatite along cleavage planes.

The name is for Professor Egon Althaus, University of Karlsruhe, Germany. Type material is at the Mineralogical Museum, Oslo, Norway. M.F.

Bonaccordite*

S. A. DEWAAL, E. A. VIJJOEN AND L. C. CALK (1974) Nickel minerals from Barberton, South Africa. VII Bonaccordite, the nickel analogue of ludwigite. *Trans. Geol. Soc. S. Africa*, 77, 373.

The mean of 9 analyses by EAV and LCC (presumably by electron microprobe) gave Fe_2O_3 (total Fe) 31.9, NiO 52.7, MgO 0.5, MnO 0.04, CoO 1.5, (misprinted as CaO), SiO_2 0.4, B_2O_3 (by difference) 13.1%. The presence of B was confirmed chemically. This corresponds to $(Ni_{1.86}Co_{0.05}Mg_{0.08})Fe_{1.05}B_{0.98}O_6$ or Ni_2FeBO_5 , the nickel analogue of ludwigite.

X-ray powder data are given. The strongest of 35 lines are 5.10 50 120, 4.61 40 200, 2.548 100 240, 2.514 100 201, 1.898 50 331. This leads to orthorhombic unit cell parameters a 9.213 ± .006, b 12.229 ± .007, c 3.001 ± .002 Å, sp gr calc 5.17, space group assumed to be $Pbam$.

Color reddish-brown, in reflected light gray with brownish tinge. Birefringence distinct in oil, anisotropy medium to strong, internal reflections strong with red-brown colors. Reflectance at 546 nm, maximum 17.6%, minimum 14.2%. Calculated mean n (Gladstone-Dale) 2.2. Vickers hardness (15 g load) 1069-1259, average 1200 kg/sq mm.

The mineral occurs with trevorite, liebenbergite, nepouite, nimitzite, bunsenite, gaspeite, violarite, and millerite in the Bon Accord area, Barberton Mountain Land, Transvaal, as clusters of slender prisms up to 400 × 30 microns, forming veins in the other minerals and as rosette-like radiating groups in liebenbergite and trevorite. The name is for the locality. M.F.

Borishanskiite*

L. V. RAZIN, L. S. DUBAKINA, V. I. MESHCHANKINA AND V. D. BEGIZOV (1975) Borishanskiite—a new plumboarsenide of palladium from the copper-nickel sulfide ores of the Talnakh differentiated intrusive. *Zap. Vses. Mineral. Obshch.* 104, 57-61 (in Russian).

Microprobe analyses gave Pd 29.8, Pb 50.4, As 21.4, and Pd 31.4, Ag 1.1, Pb 50.2, As 19.8, sums 101.6 and 102.5%. These correspond to $Pd_{1.06}(As_{1.08}Pb_{0.92})$ and $(Pd_{1.16}Ag_{0.04})(As_{1.04}Pb_{0.96})$, and the proposed ideal formula is $Pd_{1+x}(As,Pb)_2$ where $x < 0.2$.

The powder pattern closely resembles that of polarite [*Am. Mineral.* 55, 1810 (1970)]. The strongest X-ray lines (21 given) are 2.65 10 004, 2.50 6 104, 2.25 6 311, 2.16 9 040, 1.677 6 150,044, 1.385 6 032, 1.169 6 602. The pattern has been indexed as orthorhombic $a = 7.18(2)$, $b = 8.62(2)$, $c = 10.66(2)$ Å. The calculated density is 10.2 g/cm³.

The mineral was found in massive and disseminated Cu-Ni sulfide ores in the Talnakh and Oktyabr deposits. It is usually observed as 20-30 micron grains in multiminerally assemblages with Pd and Ni arsenides, Au and Ag alloys, Pd_3Pb , and $(Pd,Pt)_3Sn$, rarely as single grains (6-150 microns) enclosed in chalcopyrite, magnetite, and pyrrhotite.

* Minerals marked with an asterisk after the name were approved before publication by the Commission on New Minerals and Mineral Names, International Mineralogical Association.

Under the binocular microscope, the mineral has a dark steel-gray color and metallic luster. It is nonmagnetic and brittle. $VHN_{20} = 241(228-250)$ and $VHN_{50} = 242$ for isotropic indentations; $VHN_{20} = 182 - 292$ for anisotropic indentations. Cleavage cracks appear around the indentations, ranging from one set parallel to the inprint for isotropic indentations up to three intersecting cleavages for the anisotropic indentations.

In polished section (air) the mineral is grayish-white with no noticeable bireflection. It is light gray next to (Ag,Au) alloys and light grayish-white next to chalcopyrite. Anisotropism varies from barely noticeable to moderate with polarization colors in yellowish-gray tones. Reflectance (percent) for R'_g and R'_p 430nm 53.2 and 51.6, 460nm 54.6 and 54.1, 490nm 56.2 and 55.8, 520nm 56.4 and 56.0, 550nm 57.0 and 56.6, 580nm 57.8 and 57.3, 610nm 58.7 and 58.3, 640nm 59.8 and 59.3, 670nm 60.6 and 60.1, 700nm 61.7 and 61.2. The mineral is etched by 20% $FeCl_3$ and concentrated HNO_3 , and slightly etched by $HgCl_2$. It is negative to other standard etch reagents.

The mineral is named after Soviet mineralogist, S. S. Borishanskaya and a type specimen is preserved in the Mineralogical Museum of the Academy of Sciences of the U.S.S.R., Moscow.

Discussion

Analysis using standards closer in composition to the mineral may resolve whether it is indeed non-stoichiometric. Furthermore, the analyses for As are questionable as they were done using $AsK_{\alpha}(LiF)$ for a compound with a significant quantity of Pb. PbL_{α} has a strong peak with LiF that coincides with AsK_{α} at 1.173. The authors have not clearly stated whether the name is for $Pd_{1+x}(As,Pb)_2$ with $As \gtrsim Pb$ or whether the As:Pb ratio may vary. $PdAs$ is not known in the synthetic system whereas $PdPb$ is. Single crystal X-ray and synthesis data would also be useful. L.J.C.

Creaseyite*

S. A. WILLIAMS AND R. A. BIDEAUX (1975) Creaseyite, $Cu_2Pb_2(Fe,Al_2)Si_5O_{17} \cdot 6H_2O$, a new mineral from Arizona and Sonora, *Mineral. Mag.* **49**, 227-231.

Microchemical analysis by Miss M. Duggan (Al and H_2O by L. A. Talley) gave CuO 13.0-14.5, average of 5 13.5; ZnO 0.9-1.6, average of 5 1.2; PbO 25.8-38.5, average of 4 37.0; Fe_2O_3 11.6-13.0, average of 3 12.3; Al_2O_3 1.9, 2.3, average 2.1; SiO_2 25.6, 25.4, average 25.5; H_2O 8.6, 8.9 (Penfield, 550°), average 8.8, sum 100.4%; unit cell contents ($Cu_{8.1}Zn_{0.7}$) $Pb_{7.9}$ ($Fe_{7.4}Al_{0.2}$) $Si_{20.3}O_{88.7}(H_2O)_{23.4}$ or 4 ($Pb_2Cu_2Fe_2Si_5O_{17} \cdot 6H_2O$). Spectrographic tests showed traces of Ca, Mg, and As (mimetite); sulfate, chloride, carbonate, and fluoride were absent. The mineral is decomposed by hot dilute HCl and HNO_3 , yielding a silica sponge. Fuses to a rusty brown slag.

Rotation and Weissenberg photographs show the mineral to be orthorhombic, diffraction symbol $mmmCb$, unit cells for Tiger and Wickenburg material, respectively, a 12.483 \pm .006, 12.497; b 21.375 \pm .011, 21.375; c 7.283 \pm .004, 7.283 Å; $Z = 4$; sp gr calc 4.01, measured (sink-float) 4.1 \pm .1. The strongest X-ray lines (Tiger, Wickenburg) (18 given) are 10.726, 10.755 **10** 110,020, 6.024 **5** 111,021, 3.013 **6** 042,222; 2.982, 2.989 **5** 350.

Color Agathia green to Cyprus green, streak lighter. H 2 1/2 for spherules, higher for individual crystals. Optically biaxial, positive, refr. ind. (Na) α 1.737, β 1.747, γ 1.768 (all \pm .002), $2V$ 69° (70° calc), $r < v$ weak, Pleochroic, Y clear watery green, Z yellow-green, X similar but yellower, absorption $Z = X > Y$. $X = a$, $Z = c$, extinction parallel, fibers are length-slow.

The mineral occurs as fibers, either in spherules or matted, intertwined. Maximum length 0.5 mm, maximum width 0.05 mm.

It occurs at Tiger, Arizona, in a breccia of andesite loosely cemented with iron oxides and wulfenite; also present, murdochite, mimetite, diopside, fluorite, willemite, descloizite. Also found in smaller amounts at Wickenburg, Arizona, with fluorite and ajoite, and at Caborca, Sonora, Mexico, in andesite breccia, where it is replaced by chrysocolla.

The name is for S. C. Creasey, geologist, U.S. Geological Survey, for his studies of Arizona mines. Type material (perhaps lg) is at the British Museum of Natural History, London, and the University of Arizona, Tucson. M.F.

Krautite*

FRANÇOIS FONTAN, MARCEL ORLIAC AND FRANÇOIS PERMINGEAT (1975) La krautite, $MnHASO_4 \cdot H_2O$, une nouvelle espèce minérale. *Bull. Soc. Fr. Mineral. Crist.* **98**, 78-84.

Analyses by M.O. on 17 mg, carefully selected under the binocular, gave As_2O_5 53.7, MnO 33.0, H_2O 12.8, sum 99.5%, corresponding closely to the formula above. Qualitative tests showed very small amounts of Ca and Mg. The compound had been synthesized in 1886; it was prepared by reacting solutions of H_3AsO_4 (in excess) with $MnCO_3$, filtering, and evaporating slowly at a temperature below 100°. The DTA curve shows an endothermic peak at 230° (dehydration); the dehydration curve shows that the water is given off at 180-290°; the product is $Mn_2P_2O_7$.

X-ray study shows the mineral to be monoclinic, a 8.00 \pm .02, b 15.93 \pm .05, c 6.79 \pm .02 Å, β 96° 32' \pm 5', $Z = 8$, sp. gr. calc 3.29, measured 3.30; measured synthetic, 3.31. The strongest X-ray lines (32 given) for the mineral and the synthetic compound, respectively, are: 7.96 **10**, 7.993 **9** 020,100; 3.84 **7**, 3.862 **10** 210; 3.27 **5**, 3.304, 3.273 **10** 012,221, 201; 3.17 **7**, 3.188 **9** 230, $\bar{1}12$.

The mineral occurs as pale rose cleavage lamellae up to 2 mm in largest dimension and as aggregates of these. H less than 4; cleavage {010} micaceous, $\{\bar{1}01\}$ good, {101} distinct. Optically biaxial, positive, refr. ind. (Na), α 1.620, β 1.639, γ 1.686 (all given as \pm .02), $2V + 65 \pm 5^\circ$, $X = b$, $Z \wedge$ trace of $\{\bar{1}01\} = 16^\circ$, elongation positive.

The mineral has been found in collections at the Ecole Natl. Supérieure des Mines, Paris (type), Museum Hist. Nat. Paris, Vienna, and Smithsonian Inst. (R 10961), labelled "hoernesite" or "manganiferous hoernesite," from Sacarimb (formerly Nagyag), Transylvania, Roumania. The name is for Francois Kraut, mineralogist of the Museum nationale d'Histoire naturelle, Paris. M.F.

Magnesoaxinite*

E. A. JOBBINS, ANNE E. TRESHAM AND B. R. YOUNG (1975) Magnesoaxinite, a new mineral found as a blue gemstone from Tanzania. *J. Gemmol.* **14**, 368-375.

Microprobe analysis, using "appropriate silicates, oxides, sulfides, and pure metals as standards," gave SiO_2 44.0, TiO_2 0.03, B_2O_3 not determined, Al_2O_3 17.9, V_2O_5 0.13, Cr, Fe, Ni, Co, Na not found, MnO 0.4, MgO 6.9, CaO 21.7, ZnO 0.06, K_2O 0.01, H_2O not determined, sum 91.13%. A qualitative test for B was positive.

X-ray powder data (27 lines) showed strongest lines 6.29 **25** 110, $\bar{1}\bar{1}0$; 3.440 **65** 002, 3.139 **65** 220, 2.796 **100** 311, 2.556 **25** 212, 2.176 **28** 141, 2.150 **32** 103. These are indexed on cell dimensions a 8.933, b 9.155, c 7.121 Å, α 102.59°, β 98.28°, γ 88.09°.

The mineral is pale blue in daylight, pale violet under tungsten lighting. H greater than 6, less than 7, sp gr 3.178. Optically biaxial, positive (most axinites are negative), α 1.656, β 1.660, γ 1.668 (all \pm .001), $2V$ and optical orientation could not be determined. Pleochroic pale blue to pale violet to pale gray. Fluoresces orange-red in long-wave U.V. (3650 Å), duller red in short-wave U.V. (2357 Å).

The mineral is a rough gemstone weighing 0.1577g (0.78 carats). The name, for the composition, is proposed for the Ca_2Mg end-member of the axinite group. An axinite described by Vallance, *J. Proc. Royal Soc. N.S. Wales*, **99**, 57–67 (1966), has the composition $\text{Ca}_{2.04}(\text{Mg}_{0.89}\text{Fe}_{0.41}\text{Mn}_{0.11})$. Type material is in the Geological Museum, London. **M.F.**

Parapierrotite*

Z. JOHN, P. PICOT, J. HAK AND M. KVACEK (1975) La parapierrotite, un nouveau minéral thallifère d'Allchar (Yougoslavie) *Tschermaks Mineral. Petrog. Mitt.* **22**, 200–210.

Microprobe analyses by R. Giraud and C. Gilles, using as standards TlAsS_2 , Sb_2S_3 , and pierrotite gave Tl 19.4, 19.3, 20.2; Sb 51.8, 50.8, 50.8; As 5.0, 5.3, 3.7, 3.7; S 25.4, 24.7, 24.5; sum 101.6, 100.1, 99.2%, corresponding to (average) $\text{Tl}_{1.01}(\text{Sb}_{4.36}\text{As}_{0.84})\text{S}_{8.01}$, or ideally TlSb_4S_8 . The mineral was synthesized by addition of thallium acetate solution to solutions of Sb_2O_3 and Na_2S at pH 7–8 and heating the precipitate at 120° for 2 hours.

Weissenberg and rotation photographs showed the mineral to be monoclinic, space group $P2_1/n$, a 8.02 ± .02, b 19.35 ± .05, c 9.03 ± .02 Å, β 91°58' ± 5', $Z = 4$, sp gr calc 5.04, measured on synthetic 5.07, $a:b:c = 0.414_6:1:0.467$, measured goniometrically 0.413:1:0.466, β 91°57' ± 2'. The strongest X-ray lines (32 given) are 4.15 **9 140**, 3.696 **9 032**, 3.599 **7 122**, 3.493 **10 150**, 2.913 **9 212**, 2.22, 2.832 **10 161**, 2.356 **9 072**.

The mineral occurs as terminated prismatic crystals up to 3 mm long, but mostly less than 1 mm. Forms observed m {100}, b {010}, a {100} dominant, and 16 others. Color black, luster semi-metallic. In reflected light white with a slight creamy tint. Pleochroism weak, hardly perceptible in air; in oil from grayish-white to brownish-gray. Distinctly anisotropic, on (010), less so on (100) and (001), brownish-gray to bluish-gray, rare purple-red internal reflections. Reflectances in air and oil are given at 15 wave lengths on (100), (010), and (001). On (010) in air, maximum and minimum values in air were: 460 nm, 41.1, 30.3; 540, 39.7, 29.1; 580, 38.5, 28.6; 660, 35.1, 26.7. Microhardness (average of 5) 25 g load, 76 kg/sq mm (=Mohs 2.5–3).

The mineral occurs in cavities in realgar from the Allchar deposit, Macedonia (type locality), also at Jas Roux, Hautes Alpes, France. The name is for the relation to pierrotite (*Am. Mineral.* **57**, 1909). Type material is at the Ecole nationale supérieure des Mines, Paris. **M.F.**

Xocomecatlite*, Tlalocite*

S.A. WILLIAMS (1975) Xocomecatlite, $\text{Cu}_3\text{TeO}_4(\text{OH})_8$, and tlalocite, $\text{Cu}_{10}\text{Zn}_6(\text{TeO}_3)(\text{TeO}_4)_2\text{Cl}(\text{OH})_{28}\cdot 27\text{H}_2\text{O}$, two new minerals from Moctezuma, Sonora, Mexico. *Mineral. Mag.* **40**, 221–226.

The minerals were found in the Bambollita Mine (La Oriental) on rhyolite adjacent to oxidized vein matter or in altered

quartz–barite–sulfide vein material. The primary ores contained galena, bornite, hessite, and tellurian tetrahedrite; the zone of oxidation contains the two new minerals, and cerussite, teinite, linarite, quetzalcoaltite, carlfriesite, and cesbronite. **M.F.**

Xocomecatlite

Microchemical analysis by Miss M. Duggan gave CuO 51.3, ZnO 2.4 (by atomic absorption), TeO_3 38.7 (spectrophotometric), H_2O 8.0, sum 100.4%, corresponding to $\text{Cu}_{3.05}\text{Zn}_{0.14}\text{TeO}_4(\text{OH})_{4.3}$ or $\text{Cu}_3(\text{TeO}_4)(\text{OH})_4$. Spectrographic analysis showed traces of Fe and Ag. Microchemical tests were positive for tellurate.

The strongest X-ray lines (27 given) are 4.627 **10 220**, 3.439 **4140**, 3.099 **4 330**, 2.673 **6 340**, 2.434 **4b 134,342**. Single crystals suitable for study were not found. The pattern was indexed as orthorhombic, a 12.140 ± 0.06, b 14.318 ± 0.10, c 11.662 ± 0.06 Å., $Z = 12$, sp gr calc 4.42, measured 4.65 ± 0.1.

Color rich green, near emerald-green, streak pale green. H 4, spherules tough and brittle. Optically biaxial negative, refr. ind. (Na) α 1.775, β 1.900, γ 1.920 (all ± .005), $-2V$ 41° calc. Pleochroic in bluish green, absorption $Z > X = Y$. Dispersion low.

The mineral occurs in spherules usually less than 0.15 mm in diameter; these consist of radial needles seldom more than 5 microns in width.

The name is for the Nahuatl word for grapes, in allusion to the clusters of green spherules. Pronounced zho–ko–mecatl–ait. Type material, perhaps 100 mg in all, will be at the British Museum (Natural History), London, and the University of Paris. **M.F.**

Tlalocite

Analysis, made as stated above, gave CuO 31.0, ZnO 19.3, TeO_2 6.1, TeO_3 15.0, Cl 1.3, H_2O 27.7 = 100.4 – (O = Cl₂) 0.3 = 100.1%. Traces of Ag were present; tests showed both Te^{+4} and Te^{+6} , which were determined spectrophotometrically before and after reducing Te^{+6} . The analysis leads to the formula above.

The X-ray pattern has strongest lines (25 given) 16.787 **10**, 8.394 **8**, 4.201 **10**, 3.355 **6**. Attempts to index it on an orthorhombic cell failed (2 axes appeared to be 12.062 Å and 16.782 Å), and the mineral may be monoclinic.

Color delicate blue, near Capri blue, streak very pale blue. H = 1, gummy, sectile. sp gr 4.55 ± 0.1 (sink-float). Optically biaxial, negative, refr. ind. (Na) α 1.758 ± .002, β 1.796 ± .002, γ 1.810 (±.005), $2V$ 64° measured, 61° calc. Pleochroic, X yellowish-green, Y and Z bluish-green, absorption $Z > Y > X$. Extinction parallel. The mineral occurs in spherules or arcuate bands of lath-shaped crystals from 0.5 to about 10 microns long. Z is parallel to elongation.

The name is in allusion to the high content of water; Tlaloc was the god of rain. Pronounced tla-lauk-ait. Type material as for xocomecatlite. **M.F.**