

NEW MINERAL NAMES

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Niningerite

KLAUS KEIL AND K. G. SNETSINGER (1967) Niningerite, a new meteoritic sulfide. *Science* 155, 451-543.

Averages of electron probe analyses of the mineral from 6 enstatite chondrites (1-Abee, 2-Saint Sauveur, 3-Adhi-Kot, 4-Indarch, 5-St. Mark's and 6-Kota-Kota) give:

	1	2	3	4	5	6
S	41.0	42.7	42.6	43.4	47.4	46.9
Mg	10.1	13.2	11.3	18.3	22.7	23.5
Mn	4.02	3.93	7.1	6.5	11.8	11.6
Fe	37.1	35.2	34.2	27.0	16.6	15.6
Ca	3.03	2.55	1.96	1.28	0.53	0.39
Zn	0.31	n.d.	n.d.	n.d.	n.d.	n.d.
Cr	1.84	1.77	1.97	1.66	0.40	0.14
Total	97.40	99.35	99.13	98.14	99.43	98.13
No. of grains analyzed	20	15	14	7	10	10
<i>a</i>	5.17	5.16	n.d.	5.18	5.17	n.d.
G. calc.	3.68	3.59	3.64*	3.35	3.27	3.21

* Calc G. assuming $a = 5.17A$.

These correspond to RS, with R:S ranging from 0.97 to 1.05, or (Mg, Fe, Mn)S. Mg is dominant in nos. 4, 5, 6, but Fe > Mg in nos. 1, 2, and 3; no. 1 has Fe:Mg:Mn = 0.52:0.33:0.06.

The X-ray pattern is very similar to that of alabandite and ferroan alabandite (cubic), but with a slightly lower. The strongest lines (in Abee, no. 1) are 2.584 (200) and 1.829 (220).

Opaque in thin section, gray in reflected light, isotropic.

The mineral is intimately intergrown with nickel-iron and troilite in these enstatite chondrites, which are somewhat metamorphosed; more highly-crystallized enstatite chondrites contain ferroan alabandite. The material described as MgS [*Amer. Mineral.* 47, 1219 (1962)] is shown to have been ferroan alabandite.

The name is for H. H. Nininger of Sedonia, Arizona, for his outstanding contributions to meteoritics; it was approved before publication by the Commission on New Minerals and Mineral Names, IMA.

DISCUSSION.—It has been customary to give separate names to the parts of such a series with Mg > Fe and Fe > Mg. If the composition is found to extend much farther towards Fe, another name may be needed for the cubic phase with Fe > Mg, but for the present it seems desirable to use a single name.

Merenskyite

G. A. KINGSTON (1966). The occurrence of platinoid bismuthotellurides in the Merensky Reef at Rustenburg platinum mine in the western Bushveld. *Mineral. Mag.* **35**, 815-834.

Studies of the platinoid minerals from the ore of the Rustenburg mine have resulted in the identification of four palladium and platinum bismuthotellurides: moncheite, kotulskite, merenskyite, and Mineral A.

In reflected light merenskyite is white with a weak pleochroism from white to grayish white. In oil the pleochroism is more distinct, varying from white with a slight creamy tint to light grayish white. It is distinctly to strongly anisotropic with dark brown to light greenish gray pleochroization colors. The polishing hardness is less than pentlandite, greater than chalcopyrite, and just greater than kotulskite. Reflectivity percentages range from 61.8 at 470 $m\mu$ to 67.4 at 650 $m\mu$.

Electron probe analysis of a grain gave (before correction): Pt 1.5, Pd 27.5, Bi 14.2, Te 50.2. After correction, the values are: Pt 1.8, Pd 23.1, Bi 14.2, Te 50.8 (sum 89.9% J.A.M.). This gives a (Pd, Pt):(Te, Bi) ratio of 1.00 to 2.06. The empirical formula thus is (Pd, Pt)(Be, Ti)₂. The similarity of the powder patterns of moncheite, merenskyite, and synthetic PdTe₂ indicate that merenskyite is the palladium end-member and moncheite the platinum end-member of a possible solid solution series.

X-ray powder data are indexed on the basis of a hexagonal cell with a 3.978 \pm 0.001 Å and c 5.125 \pm 0.002 Å. Twelve spacings are given (six are indexed). The strongest spacings (in Å for Cu-K α radiation) are: 2.92 (10 $\bar{1}$ 1)(100), 2.10 (10 $\bar{1}$ 2)(60), 3.07(—)(30), 2.02 (11 $\bar{2}$ 0)(30), 1.67 (—)(30), and 1.54(10 $\bar{1}$ 3)(30).

The mineral is named in honor of Dr. Hans Merensky who was mainly responsible for the discovery of the "reef" which bears his name.

DISCUSSION.—The name was approved before publication by the Commission on New Minerals and Mineral Names, IMA.

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Unnamed

G. A. KINGSTON (1966) The occurrence of platinoid bismuthotellurides in the Merensky Reef at Rustenburg platinum mine in the western Bushveld. *Mineral. Mag.* **35**, 815-834.

Four blebs ranging from 2 to 5 μ in diameter were found intergrown with merenskyite (see preceding abstract). In reflected light it is light gray (air) and slightly darker with a brownish tint (oil). It is isotropic with reflectivity percentages as follows: 48.8 (470 $m\mu$), 53.3 (546 $m\mu$), 55.6 (589 $m\mu$), and 53.9 (650 $m\mu$). The polishing hardness is less than that of merenskyite and chalcopyrite.

Analysis by electron probe is considered only semiquantitative because of the small grain size. The data before correction are: Pd 31.5, Bi 1.5, Te 35.3, and Hg 11.9. After correction, the values are: Pd 27.8, Bi 1.6, Te 38.5, and Hg 12.0 (sum 79.9% J.A.M.). These data suggest the formula (Pd, Hg)(Te, Bi). It was not possible to obtain x-ray powder data.

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Schaurteite

Name listed by Hugo Strunz (1966) *Mineralogische Tabellen*, 4th Ed., as Ca₃GeO₂(SO₄)₂ · 6H₂O. Hexagonal, a 8.255, c 10.80Å., $Z=2$, isotypic with fleischerite. From Tsumeb, S. W. Africa.

Nissonite

MARY E. MROSE, ROBERT MEYROWITZ, J. T. ALFORS, AND C. W. CHESTERMAN (1966)
Nissonite, $\text{CuMg}(\text{PO}_4)(\text{OH}) \cdot 2\frac{1}{2}\text{H}_2\text{O}$, a new hydrous copper magnesium phosphate mineral from the Panoche Valley, California (abstr.): *Geol. Soc. Amer., Program Ann. Meet.* Nov. 14-16, 1966, p. 145-146.

Analysis on 200 mg. gave P_2O_5 27.1, V_2O_5 0.2, CuO 32.2, MgO 15.8, Fe_2O_3 0.04, H_2O^+ 16.8, H_2O^- 5.6, insol. 1.4 (=barite), total 99.14%. Easily soluble in dilute acids. X-ray study shows the mineral to be monoclinic, space group $C2/c$ or Cc , a 22.58, b 5.027, c 10.514 Å, β $99^\circ 20'$, $Z=8$. The strongest X-ray lines are 11.14 (100) (200), 2.785 (25)(800), 4.374 (21)(111), 3.716 (15)(600), 3.111 (11)(312), 1.860 (11)($\bar{6}$ 23). Cleavage (100) fair. Observed forms c {001}, a {100}, and q { $\bar{1}$ 11}. Crystals are tabular {100} and elongated [001].

The mineral occurs rarely as minute diamond-shaped crystals, more abundantly as thin crusts of crystal aggregates. Color bluish-green (Ridgway's tyrolite green). H. $2\frac{1}{2}$. G. measured 2.73 ± 0.01 , G. calc. 2.74. Optically biaxial, negative, $2V$ (calcd.) 19° , dispersion $r > v$, very strong; $\alpha = 1.584$, $\beta = 1.620$, $\gamma = 1.621$ (all ± 0.002), $Z = b$, $V \wedge c = +6^\circ$, $X \wedge a = +15^\circ$; pleochroic with X colorless, Y and Z turquoise-blue.

Nissonite occurs in a small copper prospect in metamorphic rocks of the Franciscan Formation in Panoche Valley, California. Associated minerals include malachite, azurite, libethenite, turquoise, chrysocola, cuprite, barite, calcite, gypsum, riebeckite, and crossite.

The name is for William H. Nissen (1912-1965), amateur mineralogist of Petaluma, Calif., whose preliminary micro-chemical tests characterized the mineral as a probable new copper magnesium phosphate. The mineral and name were approved prior to publication by the Commission on New Minerals and Mineral Names, IMA.

Tungusite

V. I. KUDRYASHOVA (1966) Tungsite, a new mineral of the hydrous calcium silicate group, *Dokl. Akad. Nauk SSSR* 171, 1167-1170 [in Russian].

Analyses by P. N. Nissenbaum and O. P. Ostrogorskaya gave SiO_2 47.56, 45.07; Al_2O_3 2.90, 2.97; Fe_2O_3 19.1, 1.71; FeO 11.69, 11.36; MnO 1.33, 1.44; MgO 0.84, 1.31; CaO 24.33, 26.11; Na_2O 1.61, 2.21; H_2O^- 0.60, 1.45; H_2O^+ 7.40, 6.37; sum 100.17, 100.00%. The average yields the formula



or nearly



Spectrographic analysis showed the presence of Sn, Ga, V, Sr, and Ba. DTA study shows a small endothermic reaction at 100° and a 2-stage endothermic reaction at 730 - 800° , also a broad exothermic reaction from 100 - 550° with maximum at 320° (oxidation of Fe?) and a second exothermic reaction at about 800°C .

X-ray powder data by S. I. Berkhin are given (18 lines); the strongest lines are 1.818 (10), 4.17 (8), 3.12 (8), 3.009 (8), 3.579 (6 diffuse). The pattern shows some similarities to those of gyrolite and tacharanite. The symmetry and space group are not determined.

The mineral occurs in platy aggregates of grass-green to yellowish-green color, easily separable when pressed with a needle into very fine platelets with weak pearly luster. The platelets are elastic, chlorite-like. H low, about 2. G. 2.59. Optically negative, $2V$

0°, extinction parallel, elongation positive. Birefringence 0.015–0.020, ω (or $\beta = \gamma$) = 1.568 \pm 0.002. Slightly pleochroic.

The mineral occurs as plates up to 0.5 cm, forming crusts of radiating-fibrous structure on the walls of amygdules and druses in spherulitic lava from the right bank of the Lower Tunguska River, Siberia, 2 km. above Tura. Associated minerals are analcime, apophyllite, grolite, "zeolites," calcite, and quartz. It is suggested that "chlorites," repeatedly described in the literature occurring in similar associations, may be tungusite.

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

Sorensenite

Professor L. G. Berry has kindly called my attention to an error in the abstract in *Amer. Mineral.* **51**, 1547 (1966). In the setting there given the space group is $C_{2h}^6 - I2/a$ or $C_s^4 - Ia$.

NEW DATA

Kotulskite

G. A. KINGSTON (1966) The occurrence of platinoid bismuthotellurides in the Merensky Reef at Rustenburg platinum mine in the western Bushveld. *Mineral. Mag.* **35**, 815–834.

Two electron probe analyses of kotulskite from the Rustenburg mine gave the following data before correction: Pt—, 1.0; Pd 56.8, 47.0; Bi 18.3, 21.0; and Te 32.1, 31.0.

After correction, the data are: Pt—, 1.1; Pd 45.9, 38.8; Bi 17.2, 20.1; Te 38.0, 36.1 [sum 101.1, 96.1 J.A.M.]. The formula is considered to be Pd(Te, Bi) as compared to Pd(Te, Bi)_{1–2} for type kotulskite [See *Amer. Mineral.* **48**, 1181 (1963)].

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Berryite

E. W. NUFFIELD AND D. C. HARRIS (1966). Studies of mineral sulpho-salts: XX-berryite, a new species. *Can. Mineral.* **8**, 407–413.

S. KARUP-MØLLER (1966). Berryite from Greenland: *Can. Mineral.* **8**, 414–423

A description of berryite was abstracted in *Amer. Mineral.* **51**, 532 (1966) from the published abstract of a paper presented at the 10th Annual Meeting of the Mineralogical Association of Canada. The full description, as well as a description of the mineral from another locality, now have been published. Additional data presented in these two papers are noted below.

Nuffield and Harris give X-ray powder data indexed to $d = 2.18 \text{ \AA}$ (19 spacings ≥ 2.18 , 31 spacings < 2.18). The strongest lines for Mn-filtered Fe radiation are: 3.47 (10), 2.89 (8), 2.80 (7), 2.18 (4), and 2.00 (4) \AA . The X-ray powder data given by Karup-Møller are similar. He gives 43 indexed spacings to $d = 2.4214 \text{ \AA}$. The strongest spacings for CuK α radiation are: 3.5106 (10), 2.9140 (10), 3.4957 (9), 2.8826 (7), and 2.8224 (7) \AA .

The cell parameters given by Nuffield and Harris (a 12.72, b 4.02, c 58.07 \AA , β 102 $\frac{1}{2}$ °) are in good agreement with those of Karup-Møller (a 12.707, b 4.021, c 28.92 \AA , β 102°36') when the latter's c value is doubled. Nuffield and Harris point out that their single crystal films indicate a strong pseudo-cell with $a' = a/3 = 4.24$, $b' = b = 4.02$, $c' = c/2 = 29.04 \text{ \AA}$, $\beta = 102\frac{1}{2}$ °. The space group is given as $P2_1/m$ (Nuffield and Harris) and $P2_1$ or $P2_1/m$ (Karup-Møller).

Nuffield and Harris derive from three x-ray spectrographic analyses the formula

$6[\text{Pb}_2(\text{Cu}, \text{Ag})_3\text{Bi}_5\text{S}_{11}]$. From three electron probe analyses, Karup-Møller gives the formula $2 [\text{Pb}_3\text{Bi}_7(\text{Ag}_{1.5}\text{Cu}_{3.5})\text{S}_{16}]$.

The material described by Karup-Møller is from the cryolite mine at Ivigtut, Greenland. It occurs in the lower part of the siderite-rich cryolite with fluorite, topaz, weberite, ivigtite, quartz, cosalite, galena, aikinite, and a new Pb-Bi-Ag-sulpho-salt (Mineral X). There are also small amounts of chalcopyrite, sphalerite, pyrrhotite, marcasite, pyrite and native bismuth. Berryite is always associated with Mineral X. Grains of berryite vary greatly in size up to $0.1 \times 1.0 \times 1.0$ mm.

DISCUSSION.—The publication of these two papers provides a good example of the service provided by the Commission on New Minerals and Mineral Names of the IMA. To quote from the Editor's note on Karup-Møller's paper: "An abstract of the data on this mineral reached Dr. M. Fleischer, chairman of the Commission on New Minerals and Mineral Names of the International Mineralogical Association soon after the data on berryite given in the preceding paper had been circulated to the members of the Commission. The publication of a second name for this mineral has been averted by action of the IMA Commission."

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Fairchildite, Buetschliite

MARY E. MROSE, H. J. ROSE, JR., AND J. W. MARINKENKO (1947). Synthesis and properties of fairchildite and buetschliite: their relation in wood-ash stone formation: (abst.) *Geol. Soc. Amer. Program Ann. Meet.*, Nov. 14-16, 1966, p. 146, see Milton and Axelrod, *Amer. Mineral.* **32**, 607-624.

Syntheses and X-ray study show that these two minerals are dimorphs of $\text{K}_2\text{Ca}(\text{CO}_3)_2$. Fairchildite is hexagonal, space group $P6/mmc$, $P6mc$, or $P\bar{6}2c$, a 5.29, c 13.32 Å, $Z=2$; buetschliite is trigonal, space group $R\bar{3}$, a 5.38, c 18.12 Å, $Z=3$.

DISCREDITED SPECIES

Cacoclasite

J. L. JAMBOR (1966) Constituents of cacoclasite: *Can. Mineral.* **8**, 527-529.

Optical and X-ray studies of specimens which probably are part of the type material show that cacoclasite consists primarily of grossular and calcite. Minor constituents are apatite and a clinopyroxene. Prehnite was present in some of the samples.

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