NEW MINERAL NAMES

Uramphite

Z. A. Nekrasova. A hydrous uranyl ammonium phosphate (uramphite), $NH_4(UO_2)(PO_4)\cdot 3H_2O$. *Voprosy geologii urana, Atomizdat,* **1957,** p. 67–72; from a translation by Consultants Bureau 1958, p. 56–60.

A microchemical analysis by R. P. Khodzhaevaya gave UO_3 68.70, P_2O_5 15.63, NH_4 4.60, H_2O 11.00, sum 99.93%, giving the ratio $P_2O_5:UO_3:NH_4:H_2O=1:2.2:2.3:5.5$, or $NH_4(UO_2)(PO_4)\cdot 3H_2O$. The mineral is easily soluble in weak cold HCl and in weak warm HNO_3. D.T.A. study shows endothermal breaks at 150° (loss of H_2O) and 500° (loss of NH_3 and destruction of crystal lattice), and an exothermic break, at 630° (crystallization of uranium pyrophosphate). Fluoresces medium yellow-green; the intensity of fluorescence decreases as the mineral is heated and vanishes when the mineral is heated at 500° for a long time.

Color bottle-green to pale green, luster vitreous. G. 3.7. Cleavage rather distinct in two directions. Optically negative, 2V 0–3°, α 1.564, $\beta=\gamma$ 1.585. Pleochroism X colorless, Y and Z pale green.

X-ray powder data are given for uramphite and for the synthetic material (method of synthesis not stated); 77 lines are given. The strongest lines are 3.78 (10), 2.22 (9), 1.694 (9-8), 2.75 (8), 2.12 (8), 3.24 (7), 1.399 (7), 1.267 (7).

The mineral occurs in the oxidized zone of a uranium-coal deposit in fractures in the coal 20–50 m. below the surface. The locality is not stated, as usual. The mineral occurs in square tablets (up to 0.2×0.2 mm.), in small rosettes, and as lichen-like deposits.

The name is for the composition.

Discussion.—Perhaps a member of the meta-autunite or meta-torbernite groups.

Michael Fleischer

Ursilite (Calcium ursilite, Magnesium ursilite)

A. A. Chernikov, O. V. Krumetskaya, and V. D. Sidel'nikova. Ursilite—a new silicate of uranium. *Voprosy geologii urana,* **1957,** p. 73–77; from a translation by Consultants Bureau 1958, p. 61–65.

Analyses (by O.V.K. and V.D.S.) are given of four samples.

	1	2	3	4
SiO_2	26.90	26.67	26.92	26.80
Al_2O_3	0.24	—	—	—
Fe_2O_3	0.13	0.27	0.14	—
CaO	5.75	6.67	6.31	0.79
MgO	0.95	1.55	2.49	6.72
K_2O	none	—	none	none
Na_2O	none	—	none	none
UO_3	50.57	49.80	50.40	50.32
H_2O^-	8.83	8.3	—	—
H_2O^+	6.90	5.83	14.7	14.9
Total	100.27[a]	99.09[b]	100.96	99.53

[a] Given as 100.33.

[b] Given as 99.12.

These give for the ratios

	$(CaO+MgO)$	UO_3	SiO_2	Total H_2O
(1)	0.72	1.00	2.55	5
(2)	0.9	1.00	2.55	4.5
(3)	1.0	1.00	2.53	4.7
(4)	1.08	1.00	2.55	5.7

These correspond to $2(Ca, Mg)O.2UO_3 \cdot 5SiO_2 \cdot 9\text{-}10H_2O$, with Ca predominant in Nos. 1–3 (calcium ursilite), Mg in No. 4 (magnesium ursilite). The mineral is easily soluble in acids, especially when warm, and yields silica gel. It turns black when heated.

The mineral is lemon-yellow and fluoresces greenish-yellow under ultra-violet light. Brittle, hardness 3. G. (pycnometer) 3.034 (calcium ursilite), 3.254 (magnesium ursilite). Optically biaxial, negative, indices alpha 1.548, gamma 1.556 (calcium ursilite), alpha 1.543, gamma 1.550 (magnesium ursilite). Extinction parallel, elongation positive. Weakly pleochroic with X pale green, Z green.

X-ray powder data are given for the material of analyses no. 1 (35 lines) and no. 4 (10 lines); these agree closely. The strongest lines are for calcium ursilite: 3.37 (10), 3.02 (10), 4.56 (9), 1.828 (9), 1.158 (9), 1.120 (9), 5.04 (8), 1.562 (8) 1.378 (8), 1.345 (8), 1.075 (8), 1.054 (8), 2.63 (7), 2.51 (7), 2.22 (7), 1.038 (7); for magnesium ursilite 4.98 (10), 3.06 (10), 2.30 (9), 2.07 (9), 4.58 (8), 3.37 (8), 2.42 (6), 1.981 (6), 1.798 (6).

The mineral occurs as earthy or nodular incrustations, rarely in radiating spherulites, along joints in quartz porphyries, associated with kaolinite and calcite, and rarely with uranophane, sklodowskite, and kasolite. The locality is not given.

The name is for the composition.

DISCUSSION.—The optical properties are very different from those of the calcium uranyl silicates uranophane and beta-uranophane and the magnesium uranyl silicate sklodowskite. The nearly identical optics and *x*-ray powder patterns of the Ca and Mg minerals are surprising, and further study, especially of crystal structure, is highly desirable.

M. F.

Woodfordite

JOSEPH MURDOCH AND ROBERT A. CHALMERS. Woodfordite, a new mineral from Crestmore, California. *Bull. Geol. Soc. Am.*, **69**, p. 1620–1621 (1958) (abs.).

Woodfordite occurs at the 910 ft. level of the Commercial Quarry, Crestmore, California, associated with afwillite and calcite in veins cutting massive contact rock. Analysis (not given) leads to approximately $2Ca[(SiO_3)_{0.15}(CO_2)_{0.2}(SO_4)_{0.65}] \cdot 2Ca(OH)_2 \cdot Al(OH)_3 \cdot 10H_2O$ (CO_2 error for CO_3? M.F.). Readily soluble in HCl, usually with slight effervescence. When heated, loses water readily, turns white and fibrous, but apparently does not fuse.

Transparent, colorless, hardness 2.5, G. 1.85. Optically uniaxial, negative, ω 1.465, ϵ 1.455.

Hexagonal, in prisms, with $(10\bar{1}0)$ dominant, (0001) normally present, $(10\bar{1}2)$ sometimes present, $(70\bar{7}8)$ (?) usual. Cleavage prismatic perfect. *X*-ray study shows $P6_3$ or $P6_3/m$, a_0 22.32, c_0 21 .33A. The strongest lines are in Å., 9.67-10, 5.6-9, 3.88-6, 2.568-6, 2.204-6.

The name is for Professor A. O. Woodford of Pomona College who found the mineral.

DISCUSSION.—This is close in composition and physical properties to ettringite. The compositions may be compared:

Ettringite—$Ca_6Al_2(SO_4)_3(OH)_{12}\cdot 26H_2O$
Woodfordite—$Ca_6Al_{1.5}(SO_4, SiO_3, CO_3)_3(OH)_{10.5}\cdot 15H_2O$

M. F.

Heinrichite, Meta-heinrichite
Sandbergerite, Meta-sandbergerite

E. B. Gross, A. S. Corey, R. S. Mitchell, and Kurt Walenta. Heinrichite and meta-heinrichite, hydrated barium uranyl arsenate minerals. *Am. Mineral.*, **43**, 1134–1143 (1958).

Arsenuranocircite

L. N. Belova. Arsenuranocircite, $Ba(UO_2)_2(AsO_4)_2\cdot 8H_2O$. *Proc. 2nd Geneva Conf. on Peaceful Uses of Atomic Energy*, **1958**, vol. 2, p. 294.

The data from the Russian paper are as follows: Analysis by Y. S. Nesterova and L. E. Novorossova gave BaO (given as Ba, but the mol. ratio indicates this to be BaO M.F.) 12.99, As_2O_5 23.46, UO_3 50.03, H_2O 12.00, sum 98.48%. Occurs in a pitchblende-molybdenite deposit as large tabular light green plates associated with metazeunerite and barium uranophane. Brightly fluorescent, like uranocircite. Optically uniaxial, negative, ω 1.632, ϵ 1.623. Unindexed x-ray powder data are given; (43 lines); the strongest are 9.82 (8), 3.68 (8), 1.461 (8), 8.64 (5), 4.04 (5), 2.20 (5), 1.656 (5).

Discussion.—The identity of "arsenuranocircite" with meta-heinrichite is evident, despite the discrepancies in birefringence and x-ray spacings. The use of three different names appearing almost simultaneously is unfortunate; it is not clear which has priority. The names heinrichite and meta-heinrichite first appeared in a note by Walenta in *Der Aufschluss*, **9**, No. 10, p. 247–248, October, 1958. The name sandbergerite has been dropped by mutual agreement, which leaves a choice between heinrichite and arsenuranocircite (the mineral described should have been called meta-arsenuranocircite). The description of heinrichite is much more complete.

M. F.

Meta-Kirchheimerite

K. Walenta. Die sekundaren Uranmineralien des Schwarzwaldes. Preliminary report, *Techn. Hochschule, Stuttgart*, **1958**, from an abstract in *Bull. soc. franc. mineral. et. crist.*, **81**, p. 67–68 (1958).

A member of the meta-torbernite group, probably $Co(UO_2)_2(AsO_4)_2\cdot 8H_2O$. Microchemical analysis showed major Co, U, and As, a little Fe, and traces of Ni. In pale rose crusts and tabular crystals. Cleavage (001) excellent. Luster pearly on the cleavage. Hardness 2–2½. G. above 3.33. Optically uniaxial to biaxial, negative, 2V 0–20°. Color greenish-yellow to colorless, not pleochroic, ω 1.644, ϵ 1.617 (both ± 0.002).

The strongest x-ray lines are 8.55 (10), 3.56 (10), 5.07 (6), 4.30 (6), 3.00 (6), 3.41 (5), 2.52 (5).

Occurs in the Sophia shaft at Wittichen, Baden, on pitchblende. It is associated with meta-kahlerite, novacekite, meta-heinrichite, and erythrite.

The name is for F. Kirchheimer, director of the Geologisches Landesamt für Wurttemberg-Baden.

M. F.

Barium uranophane

L. N. Belova. Barium uranophane. *Proc. 2nd Internatl. Conf. Peaceful Uses of Atomic Energy, Geneva*, **1958**, v. 2, p. 295.

The mineral occurs in crusts and thin crystals associated with arsenuranocircite and relicts of pitchblende, soddyite, uranophane, and metazeunerite near a large fault filled by thick barite veins. The crystals have pyramidal terminations. They are bright yellow; fluorescence in ultra-violet green-yellow, a little more intense than normal uranophane.

There was not enough material for chemical analysis. Semiquantitative spectrographic analysis by L. N. Indichenko showed Ba, U, Si-n%, Mo, Al, Ca-0.n%, Mg, Zn-0.0n%, Ti-0.00n%.

The mineral is biaxial, positive, α 1.797, β 1.818, γ 1.820, extinction $c:\gamma=10\text{-}14°$.

X-ray powder data (19 lines) are given; the strongest lines are 7.93 (8), 3.99 (6), 2.14 (5), 1.997 (6), 3.58 (4), 3.38 (4), 2.88 (4), 2.23 (4). "The *x*-ray data are very similar to those of other uranium silicates, especially of cuprosklodowskite."

Discussion.—Needs further study.

M. F.

Sinicite

Ho Chen-Tsi and Chun Chi-Chen. Sinicite, a new mineral, a uranium-bearing titanate. *Kasyua Tunbao* ("*Scientia*") **1957,** No. 12, p. 378; from an abstract by E. M. Bonshtedt-Kupletskaya in *Zapiski Vses. Mineral. Obshch.*, **87,** No. 4, p. 479 (1958).

The mineral is blackish-brown to reddish-brown, streak reddish-brown, luster resinous. Hardness about 6, very brittle, fracture conchoidal. G. 4.919–4.976.

Analyses gave:

	Blackish-brown	Reddish-brown		Blackish-brown	Reddish-brown
MgO	0.33	0.55	ThO_2	8.29	7.93
CaO	1.20	1.36	UO_3	5.98	6.83
PbO	0.84	—	TiO_2	24.96	
MnO	0.15	0.12	Nb_2O_5	20.85	47.48
FeO	none	—	Ta_2O_5	2.75	
Fe_2O_3	4.44	3.62	H_2O^-	0.21	0.85
Al_2O_3	1.81	2.08	H_2O^+	2.53	3.37
Ce_2O_3	7.79	5.74	SiO_2	0.59	0.31
$[Ce]_2O_3$	10.87	11.40			
$[y]_2O_3$	6.91	7.27		100.50	98.91

The formula is given as

$$2RO \cdot 4R_2O_3 \cdot ThO_2 \cdot 3(Nb, Ta)_2O_5$$

The material, heated at 1000° for 2 hours, gave an *x*-ray pattern with lines (in Å.): 2.94 (10), 1.63 (8), 1.58 (6), 3.04 (4), 2.56, 2.45, 2.04, 1.92, 1.81 (2), 1.74 (1).

Occurs in a granite pegmatite in China in the zone of coarse feldspar and mica, associated also with quartz, biotite, muscovite, topaz, fluorite, tourmaline, and beryl.

Discussion.—Comparison with the many other minerals of similar composition is needed.

M. F.

Seidozerite

E. I. Semenov, M. E. Kazakova, and V. I. Simonov. A new zirconium mineral, seidozerite, and other minerals of the wöhlerite group in alkalic pegmetites. *Zapiski Vses. Mineralog. Obshch.*, **87,** No. 5, p. 590–597 (1958) (in Russian).

Analysis by M. E. K. gave SiO_2 31.40, ZrO_2 23.14, TiO_2 13.16, Nb_2O_5 0.60, Al_2O_3 1.38, Fe_2O_3 2.85, FeO 1.06, MnO 4.22, MgO 1.79, CaO 2.80, Na_2O 14.55, H_2O 0.60, F 3.56, sum 101.11% − ($O=F_2$) 1.49 = 99.62%. This corresponds to

$$Na_{1.79}Ca_{0.19}Mn_{0.23}Mg_{0.17}Fe_{0.06}''Fe_{0.13}'''Al_{0.10}Zr_{0.72}Ti_{0.63}Nb_{0.02}Si_2O_8(F_{0.72}O_{0.28})$$

(Note—should be $(OH)_{0.28}$ M.F.) or approximately $Na_2Mn_{0.5}(Zr, Ti)_{1.5}Si_2O_8F$. This is compared to the formulas of other members of the wöhlerite group; it is close to titanolavenite, but has much less calcium. *X*-ray spectrographic analysis by I. D. Shevaleevskii gave ZrO_2 23, HfO_2 0.4%; spectrographic analysis showed traces of Pb, Sn, Cr, Be, and Ga. Dissolves with difficulty in HCl. Fuses easily before the blowpipe.

An *x*-ray study by V. I .Simonov and N. V. Belov, *Doklady Akad. Nauk S.S.S.R.* **122,** 473–476 (1958) suggests that the formula should be written as

$$Na_4MnTi(Zr_{1.5}Ti_{0.5})O_2(F, OH)(Si_2O_7)_2.$$

Seidozerite is monoclinic, occurring in radiating crystals up to 5×1 cm. in size. Monoclinic, forms noted *c*(001), *a*(100), *e*(203), *b*(010), *d*(011), *p*(111); goniometric data gave $a:b:c=0.780:1.00:2.601$, β102°43′. Rotation diagrams gave space group C_s^2—Pc or C_{2h}^4—$P2/c$, (test for piezo-electricity negative), a_0 5.53±0.03, b_0 7.10±0.04, c_0 18.30±0.1A., β 102°43′, $a:b:c=0.779:1.00:2.58$, Z=4. (Note—the orientation differs from that generally given for members of this group: $a_0=\frac{1}{2}a$, $b_0=c$, $c_0=2\frac{1}{2}b$. M.F.). Cleavage perfect (001). *X*-ray powder data by N. N. Sludsko are given; the strongest lines are 2.89 (10), 2.83 (9), 3.21 (7), 3.97 (5), 2.00 (5), 1.792 (5).

The mineral is brownish-red to reddish-yellow in small fragments, translucent with red color. Luster strong, vitreous. Brittle. Hardness 4–5, G. 3.472., 3.87 (calcd. from *x*-ray data). Optically biaxial, positive, with α 1.725, β 1.758, γ 1.830, 2V 68°, plane of optic axes parallel (001), X=*b*, Z=*a*, Y:*c*=13°. Strong dispersion of optic axes, $r>v$. Pleochroism intense, X dark red, Y red, Z light yellow; absorption X>Y>Z.

The mineral has been found in four nepheline syenite pegmatites of the Muruai and Uel'kuai Rivers, Seidozero region, Lovozero massif, Kola Peninsula, where it occurs with microcline, aegirine, nepheline, apatite, pyrochlore, magnetite, ilmenite, titanolavenite, and eudialyte. It is replaced by minerals of the catapleiite type.

The name is for the region.

DISCUSSION.—A member of the wöhlerite group. The entire group needs a thorough *x*-ray study.

M. F.

Unnamed

L. S. RUPNITSKAYA. Calcium uranium molybdate, $Ca(UO_2)_3(MoO_4)_3(OH)_2 \cdot 8H_2O$ *Proc. 2nd Internatl. Conf. Peaceful Uses of Atomic Energy, Geneva,* **1958, 2,** 286.

The mineral occurs as elongated prismatic crystals forming sheaf-like radiating aggregates up to 1.5 mm. long. It has a rich yellow color, with a honey tint. Fluorescence yellow-green, a bit brighter than that of uranophane. *ns* above 1.758; pleochroic with Z bright yellow, X nearly colorless. Microchemical analysis gave UO_3 61.26, MoO_3 19.90, CaO 4.63, SiO_2 3.86, H_2O 10.90, sum 100.55%; corrected after deducting uranophane, UO_3 58.65, MoO_3 27.20, CaO 3.91, H_2O 10.21, sum 99.97%. Spectrographic analysis showed also 0.01–0.1% Fe and As and traces of Al. Readily attacked by dilute HCl. and HNO_3.

X-ray powder data (16 lines) are given; the strongest are 7.85 (10), 3.21 (8), 3.89 (6), 8.34 (5), 1.99 (5), 1.855 (4).

The mineral occurs in the lower part of the oxidation zone of hydrothermal uranium-molybdenum veinlets (locality not given).

M. F.

Chalcopentlandite

HANS PAULY. Igdlukunguaq nickeliferous pyrrhotite, texture and composition. A contribution to the genesis of the ore type. *Meddelelser om Gronland,* **157,** No. 3, 1–167 (1958).

The name chalcopentlandite is given to an assumed high-temperature phase, now represented by a two phase aggregate of chalcopyrite (perhaps 10%) in pentlandite, and believed to have been formed by exsolution. Some areas were found by microscopic study (no *x*-ray data!) that might be "untransformed chalcopentlandite."

M. F.

Simplotite

M. E. THOMPSON, C. H. ROACH, AND ROBERT MEYROWITZ. *Am. Mineral.,* **43,** 16–24 (1958).

Santafeite

MING-SHAN SUN AND R. H. WEBER. *Am. Mineral.,* **43,** 677–687 (1958).

Sherwoodite

M. E. THOMPSON, C. H. ROACH, AND ROBERT MEYROWITZ. *Am. Mineral.,* **43,** 749–755 (1958).

Eskolaite

OLAVI KUOVO AND YRJO VUORELAINEN. *Am. Mineral.,* **43,** 1098–1106 (1958).

Ajoite

W. T. SCHALLER AND A. C. VLISIDIS. *Am. Mineral.,* **43,** 1107–1111 (1958).

Chavesite

JOSEPH MURDOCH. *Am. Mineral.,* **43,** 1148–1156 (1958).

NEW DATA

Messelite, Neomesselite

F. ČECH AND K. PADERA. Messelit aus den Phosphatnestern im Granit bei Pribyslavice (Bohmen) und das Messelitproblem. *Chem. der Erde,* **19,** No. 4, 436–449 (1958).

Messelite was described from Messel, Hesse, by Muthmann in 1890 as $Ca_2(Fe, Mg)(PO_4)_2 \cdot 2\frac{1}{2}H_2O$. In 1940, Wolfe (*Am. Mineral.,* **25,** 738–753, 787–809 (1940)) re-examined type material and showed that it was a mixture of two minerals, namely anapaite plus a mineral he thought to be collinsite. Frondel (*Am. Mineral.,* **40,** 828–833 (1955) found a mineral at Palermo, N. H., that corresponded in composition with messelite and gave it the name neomesselite.

Restudy of material from the type locality by optical and *x*-ray methods now shows that the major constituent is identical with the neomesselite of Frondel; this mineral is rimmed by anapaite. Data are also given for samples from Czechoslovakia and Kazakhstan.

DISCUSSION.—Which name to keep is a problem; the authors, in agreement with Professor Strunz, consider that messelite should be retained, since this was the major constituent of the mixture probably studied by Muthmann. I agree; the name neomesselite should be dropped.

M. F.

Taramellite

FLORENZO MAZZI. Riesame della taramellite. *Atti soc. tosc. sci. nat., ser. A, v.* **64,** p. 237–245 (1957).

Re-analysis of taramellite (Tacconi, 1908) showed that the presence of Ti had been overlooked. A new analysis on material dried at 110° gave SiO_2 33.9, TiO_2 7.7, Fe_2O_3 12.2, FeO 3.7, MgO 0.8, BaO 37.5, CaO 1.1, Na_2O 0.8, K_2O 0.1, H_2O^+ 2.1, sum 99.9%. This corresponds to $(Ba, Ca, Na)_4(Fe'', Mg)Fe_2'''Ti(Si_4O_{12})(OH)_4$, with a little Ti replacing Si. *X*-ray study showed the mineral to be orthorhombic with a_0 7.05, b_0 13.95, c_0 12.01 Å (all ±0.5%), Z=2. Space group $C_{2v}^7(Pnm2_1$ or $Pn2_1m)$ or $D_{2h}^{13}(Pnmm)$. The mineral is apparently to be classed as a sorosilicate.

M. F.

Bismutoferrite, Chapmanite

Charles Milton, J. M. Axelrod, and Blanche Ingram. *Am. Mineral.*, **43,** 656–670 (1958).

Roscherite

M. L. Lindberg. *Am. Mineral.*, **43,** 824–838 (1958).

DISCREDITED MINERALS

Truscottite (=Reyerite)

H. Strunz, and H. Micheelsen. Calcium-Phyllosilikate. *Naturwissenschaften*, **21,** 515–516 (1958).

In this preliminary note, it is stated that chemical, optical, and *x*-ray powder data show the identity of truscottite (Hovig, 1914) with reyerite (Cornu and Himmelbauer, 1907). Reyerite has space group $C_{3i}^1-C\bar{3}$, a_0 9.73, c_0 18.72 Å, idealized formula $Ca_9(OH)_6Si_{15}O_{36}$, Z=2. Mackay and Taylor, *Mineralog. Mag.*, **30,** 450–457 (1954) found for truscottite *a* 9.72, *c* 18.71 Å, unit cell contents near $Ca_{12}(OH)_{12}Si_{24}O_{54}$.

M. F.

Centrallasite (=Gyrolite)

H. Strunz, and H. Micheelsen. Calcium-Phyllosilikate. *Naturwissehschaften*, **21,** 515–516 (1958).

Centrallasite (How, 1859) is stated to be identical with gyrolite (Anderson, 1851), as previously reported by Bannister (private communication to M. H. Hey, Chemical Index of Minerals). Gyrolite is hexagonal with a_0 9.80, c_0 22.08 A. Mackay and Taylor, *Mineralog. Mag.*, **30,** 80–91 (1953) found it to be trigonal with a_0 9.72, c_0 6×22.13 A. It is suggested that perhaps two modifications exist.

M. F.

Radiophyllite (=Zeophyllite)

H. Strunz, and H. Micheelsen. Calcium-Phyllosilikate. *Naturwissenschaften*, **21,** 515–516 (1958).

It is stated that chemical, optical, and *x*-ray study show radiophyllite (Brauns and Brauns, 1924) to be identical with zeophyllite (Pelikan, 1902).

M. F.

Hypochlorite (Bismutoferrite+Quartz)

Charles Milton, J. M. Axelrod, and Blanche Ingram. *Am. Mineral.*, **43,** 656–670 (1958).

M. F.