

## NEW MINERAL NAMES

### Novakite

Z. JOHAN AND J. HAK. Novakit—(Cu, Ag)<sub>4</sub> As<sub>3</sub>, ein neues Mineral. *Chem. der Erde*, **20**, 49–50 (1959).

A preliminary note. Analysis (mean of 2) gave Cu 41.39, As 43.30, Fe 5.13, Ag 1.96, Co 0.79, S 2.73, CaO 2.72, CO<sub>2</sub> 2.13, sum 100.15%. After deducting calcite, S as chalcocite, and Fe as loellingite (these minerals were identified by microscopic and x-ray study) and recalculation to 100, this gives As 45.82, Cu 50.91, Ag 3.27%, corresponding to (Cu, Ag)<sub>1.36</sub> As or (Cu, Ag)<sub>4</sub> As<sub>3</sub> or (Cu, Ag)<sub>11</sub> As<sub>8</sub>. When heated, the mineral decomposes below its melting point to Cu<sub>2</sub>As and an unidentified phase. Etched by HNO<sub>3</sub> 1:1, HCl 1:1, 20% FeCl<sub>3</sub> solution, not etched by 40% KOH or KCN.

The mineral is steel-gray on fresh fracture, tarnishes to dull colors and finally becomes nearly black. Alters easily to secondary minerals. In polished section the mineral appears white, somewhat yellowish compared to native As. Anisotropy medium strong, with dark bluish-gray to bright ocher-brown polarization colors. The reflecting power is slightly higher than that of native As. Hardness 3–3½. G approximately 6.7 (some chalcocite and loellingite present).

The strongest x-ray lines are 1.870 (10), 1.182 (10), 1.998 (9), 1.957 (9), 1.910 (7), 1.352 (6), 1.225 (6), 1.787 (5). From the powder pattern, novakite is tetragonal, with *a*<sub>0</sub> 8.20<sub>6</sub> Å., *c*<sub>0</sub> 11.88 Å., and is therefore pseudocubic. Cleavage none.

The mineral occurs in irregular grains in the carbonate gangue of the complex Cu-Co-Fe-As ores of Černý Dul (Schwarzenthal), Riesengebirge.

The name is for Jiří Novák, Professor of Mineralogy, Charles University, Prague.

DISCUSSION. The constants given lead to a cell content of (Cu, Ag)<sub>26.5</sub> As<sub>19.9</sub>.

MICHAEL FLEISCHER

### Cornubite

G. F. CLARINGBULL, M. H. HEY, AND R. J. DAVIS. Cornubite, a new mineral dimorphous with cornwallite. *Mineralog. Mag.*, **32**, 1–5 (1959).

X-ray data showed the existence of this new mineral at 5 localities in Cornwall, one in Devon, and one in Cumberland; associated minerals include cornwallite, obvenite, liroconite, and malachite. It is light-green, apple-green to dark-green, usually fibrous, but also massive, porcellanous. No optical data are given. Microchemical analysis on 6.6 mg. gave CuO 59.86, As<sub>2</sub>O<sub>3</sub> 35.07, H<sub>2</sub>O (5.07) (by diff.), sum (100.00%), corresponding closely to Cu<sub>5</sub>(AsO<sub>4</sub>)<sub>2</sub>(OH)<sub>4</sub>. G. 4.64, calcd. from x-ray data 4.8. The mineral lost only 2.8% H<sub>2</sub>O at 450°. A fiber photograph was indexed to give *d*<sub>100</sub> 5.35 Å., *d*<sub>010</sub> 4.72 Å., *γ*\* 88°; attempts to index completely indicate that the mineral is triclinic, with *d*<sub>100</sub> and *d*<sub>010</sub> double the above values. The strongest x-ray lines are 4.72 (10), 2.562 (10), 2.489 (10), 2.688 (9), 3.49 (8), 2.868 (7), 2.303 (7), 1.575 (7), 1.492 (7), 5.35 (6), 3.59 (6), 3.33 (6), 3.10 (6), 3.05 (6), 2.98 (6), 2.932 (67), 2.090 (6), 1.957 (6), 1.515 (6), 1.373 (6).

The name is from Cornubia, the Roman name for Cornwall.

M.F.

### Delhayelite

TH. G. SAHAMA, AND KAI HYTONEN. Delhayelite, a new silicate from the Belgian Congo. *Mineralog. Mag.*, **32**, 6–9 (1959).

The new mineral occurs in platy crystals in kalsilite-melilite-nephelinite lava, Mt. Shaheru, Belgian Congo (see gotzenite, combeite, kirschsteinite, *Am. Mineral.* **43**, 791–792

(1959)). It was purified with difficulty, the sp. gr.  $2.60 \pm 0.03$  being very close to those of kalsilite and nepheline. Treatment with warm dilute acetic acid dissolved kalsilite and attacked delhayelite only slightly. Analysis, after correction for 2% admixed nepheline, gave  $\text{SiO}_2$  52.60,  $\text{TiO}_2$  0.09,  $\text{Al}_2\text{O}_3$  9.22,  $\text{Fe}_2\text{O}_3$  (total iron) 2.72,  $\text{MgO}$  1.03,  $\text{MnO}$  0.07,  $\text{CaO}$  7.99,  $\text{Na}_2\text{O}$  3.20,  $\text{K}_2\text{O}$  9.27,  $\text{H}_2\text{O}^-$  3.35,  $\text{H}_2\text{O}^+$  5.93,  $\text{Cl}$  3.91,  $\text{F}$  0.33,  $\text{SO}_3$  1.31, sum 101.02—( $0 = \text{F}_2\text{Cl}_2$ ) 1.01 = 100.01%. This corresponds to  $(\text{Na}, \text{K})_4\text{Ca}_5\text{Al}_6\text{Si}_{32}\text{O}_{80} \cdot 18 \text{H}_2\text{O} \cdot 3(\text{Na}, \text{K})_2(\text{Cl}_2, \text{F}_2, \text{SO}_4)$ .

Rotation and Weissenberg photographs show the mineral to be orthorhombic, space group  $P m n 2$  or  $P m m n$ ; the unit cell has  $a$   $13.05 \pm 0.06$ ,  $b$   $24.65 \pm 0.2$ ,  $c$   $7.04 \pm 0.03$  Å. Cleavage (010) distinct. Indexed  $x$ -ray powder data are given; the strongest lines are 3.078 (100), 12.30 (35), 6.158 (25), and 3.482 (10).

The mineral is colorless. In thin section shows a somewhat wavy extinction; interference colors very low, abnormally bluish-gray in sections perpendicular to the  $b$ -axis. Optically negative,  $2V = 83 \pm 3^\circ$  (by Berek compensator), birefringence 0.002–0.003,  $\alpha \sim \beta \sim \gamma = 1.532 \pm 0.002$ ,  $a = \alpha$ ,  $b = \gamma$ ,  $c = \beta$ .

The unit cell dimensions are close to those for rhodesite, but the chemical composition and optical properties are different.

The name is for F. Delhaye, Belgian geologist, "a pioneer in the exploration of North Kivu."

M.F.

### Angelellite

PAUL RAMDOHR, F. AHLFELD, AND F. BERNDT. Angelellit, ein natürliches triklines Eisen-Arsenat,  $2 \text{Fe}_2\text{O}_3 \cdot \text{As}_2\text{O}_5$ . *Neues Jahrb. Mineral., Monatsh.*, 1959, No. 7, 145–151.

K. WEBER. Eine kristallographische Untersuchung des Angelellits,  $2\text{Fe}_2\text{O}_3 \cdot \text{As}_2\text{O}_5$ . *Ibid.*, 152–158.

Analyses by Berndt (No. 1 fused with  $\text{KHSO}_4$ , others with  $\text{HCl}$  and  $\text{KCl} + \text{KClO}_3$ ) gave:

	1	2	3
$\text{Fe}_2\text{O}_3$	55.8	43.8	59.3
$\text{As}_2\text{O}_5$	32.2	24.5	28.2
$\text{SiO}_2$	5.81	2.61	2.73
$\text{SnO}_2$	2.92	0.43	0.39
$\text{Al}_2\text{O}_3$	2.82	2.15	1.26
Insol.		25.62	8.16
	99.55	99.11	100.04
$\text{Fe}_2\text{O}_3/\text{As}_2\text{O}_5$	2.49	2.57	3.03
(calcd. by M.F.)			

Later  $x$ -ray fluorescence study by Weber showed that about 3% Sb is present and that the ratio  $\text{Fe}_2\text{O}_3:\text{As}_2\text{O}_5$  was close to 2; his  $x$ -ray study showed the presence of cassiterite and also hematite, the latter as a thin overgrowth. The formula is therefore  $\text{Fe}_4(\text{As}, \text{Sb})_2\text{O}_{11}$ . Difficulty fusible before the blowpipe to a magnetic bead. Slowly dissolved by  $\text{HCl}$ .

Weissenberg photographs show the mineral to be triclinic, space group  $C_1^1$ , or  $C_1^1$ ,  $a_0$  5.03,  $b_0$  6.49,  $c_0$  7.11 (all  $\pm 0.01$ ) Å,  $\alpha$   $114.4^\circ$ ,  $\beta$   $116.4^\circ$ ,  $\gamma$   $81.9^\circ$  (all  $\pm 1^\circ$ ),  $Z=1$ . Oriented intergrowths with hematite have  $a$  of angelellite parallel to the hexagonal  $a$ -axis of hematite ( $a_0$  5.03 Å). Partially indexed  $x$ -ray powder data (29 lines) are given; the strongest are

3.152 (10) (10 $\bar{2}$ ), 2.997 (7) (101), 2.856 (5), 2.489 (5), 2.072 (5), 2.960 (4), 2.955 (4). The crystals show the faces *c* (001), *a* (100), and *d* (021) well developed, also *f* (101) *g* (032), *h* (031), *i* (111), and *k* (101). Usually tabular with (001) and (001) dominant. An angle table is given. Cleavage (001), fracture conchoidal. Brittle.

The mineral is blackish-brown, streak reddish-brown, luster adamantine to semi-metallic. H. 5½, G. 4.95, 4.86<sub>7</sub> (pycnometer), 4.86<sub>2</sub> (calcd. from *x*-ray data). Optically biaxial, positive, 2 V medium large, *n<sub>s</sub>* (by immersion in Se-S melts in Na light)  $\alpha$  2.13,  $\beta$  about 2.2,  $\gamma$  2.40. Strongly pleochroic from deep blood-red to reddish-brown in thin section, to light yellow in powders. Absorption Z>X. Polishes well; in reflected light strongly anisotropic, reflecting power high, near that of sphalerite.

The mineral occurs as globular and crystalline incrustations on andesite from the Cerro Pululus tin mine, northwestern Argentina. It is believed to be of exhalative origin; probably deposited from fumarolic vapors.

The name is for V. Angelelli, Argentine mineralogist.

DISCUSSION. Presumably to be classed with the anhydrous phosphates (Dana class 38), but differs from all known types.

M.F.

#### Unnamed (Mineral S)

H. STRUNZ, *Tsumeb, seine Erze und Sekundär-mineralien, insbesondere der neu aufgeschlossenen zweiten Oxydationszone. Fortschr. Mineral.*, **37**, 87–90 (1959).

Preliminary note. The mineral occurs as pyrite-like, highly reflecting crystals. Tetragonal with *a*<sub>0</sub> 6.70, *c*<sub>0</sub> 9.53 Å., tetragonal cleavage distinct. The *x*-ray powder diagram resembles that of linneite and may indicate a deformed spinel structure. The strongest lines are 1.54 (10), 2.87 (8), 2.96 (7), 1.68 (6), 2.38 (5). Spectrographic analysis shows Ge and Ni with a little Cu and Fe; perhaps (Ni, Cu)<sub>2</sub> GeS<sub>4</sub>. Hardness 3½–4, reflection in oil near 50%.

M.F.

#### Unnamed (Mineral R)

H. STRUNZ, *Fortschr. Mineral.*, **37**, 87–90 (1959).

Apparently a copper-zinc arsenate. Color light rose. Apparently triclinic, two pinacoidal cleavages, *a*<sub>0</sub> 7.69, *b*<sub>0</sub> ?, *c*<sub>0</sub> 6.59, *n<sub>s</sub>*  $\alpha$  1.583,  $\beta$  1.62,  $\gamma$  1.633. Soluble in HCl.

M. F.

#### Zinclavendulan

H. STRUNZ, *Fortschr. Mineral.*, **37**, 87–90 (1959).

Blue orthorhombic crystals, *a*<sub>0</sub> 9.87, *b*<sub>0</sub> 38.7, *c*<sub>0</sub> 9.99 Å (compare *Am. Mineral.*, **42**, 123–124 (1957)) of (Ca, Na)<sub>2</sub> (Cu, Zn)<sub>5</sub> Cl (AsO<sub>4</sub>)<sub>4</sub>·4–5 H<sub>2</sub>O.

M. F.

#### Zincrosasite

H. STRUNZ, *Fortsch. Mineral.*, **37**, 87–90 (1959).

(Zn, Cu)<sub>2</sub> (OH)<sub>2</sub> CO<sub>3</sub> with atomic ratio Zn:Cu = 58.6:51.9, whereas Cu is predominant in rosasite.

M. F.

#### *p*-Veatchite

OTTO BRAITSCHE, Über *p*-Veatchit, eine neue Veatchit-Varietät aus dem Zechsteinsalz. *Beitr. Mineral. u. Petrog.*, **6**, 352–356 (1959).

Material from the Königshall-Hindenburg Mine, Reyershausen, Germany, agrees in *x*-ray powder pattern and physical properties, but not in space group or unit cell constants with veatchite from California, and is named *p*-veatchite. It has space group  $P2_1/m$  or  $P2_1$ ,  $a_0$  6.72,  $b_0$  20.81,  $c_0$  6.647 Å.,  $\beta$  119°4',  $Z=4$ , whereas that from California (Clark et al., 1958) has space group  $A 2/a$  or  $Aa$ ,  $a_0$  20.81,  $b_0$  11.75,  $c_0$  6.637 Å.,  $\beta$  92°2',  $Z=8$ .

DISCUSSION. Needs confirmation.

M. F.

### Pandaite

E. JAGER, E. NIGGLI, AND A. H. VAN DER VEEN. A hydrated barium-strontium pyrochlore in a biotite rock from Panda Hill, Tanganyika, *Mineralog. Mag.*, **32**, 10–25 (1959).

The mineral was found in a highly weathered biotite-rich rock occurring in a roof pendant of the Mbeya (also called the Panda Hill) carbonatite, near Mbeya, Tanganyika. The rock contains major biotite, kaolinized orthoclase, and limonite, minor fluorite, quartz, apatite, zircon, chlorite, plagioclase, rutile, and hematite.

Analysis of a sample dried at 110° gave Na<sub>2</sub>O 0.28, K<sub>2</sub>O 0.25, CaO 1.35, BaO 12.5, SrO 6.4, PbO 0.01, rare earths 2, ThO<sub>2</sub> 0.6, FeO (total iron) 0.45, MgO 0.07, MnO 0.01, CuO 0.01, TiO<sub>2</sub> 3.9, Nb<sub>2</sub>O<sub>5</sub> 67, Ta<sub>2</sub>O<sub>5</sub> 0.22, ZrO<sub>2</sub> 0.28, SnO<sub>2</sub> 0.32, SiO<sub>2</sub> 0.89, Al<sub>2</sub>O<sub>3</sub> 0.12, SO<sub>3</sub> trace, CO<sub>2</sub> 0.1, F trace, P<sub>2</sub>O<sub>5</sub> 0.4, sum 10 1.16%. Another sample containing 67% Nb<sub>2</sub>O<sub>5</sub> contained U 0.31, Th 0.72%. Spectrographic analysis showed the presence in the rare earths of Ce, Y, and La in the ratio 40:2:1. Infra-red spectrophotometry by J. H. L. Zwiers gave no indication of hydroxyl groups. This is corrected, deducting zircon 0.42, phlogopite 0.27, orthoclase 0.42, apatite 0.92, cassiterite 0.32, quartz 0.33, rutile 0.15%, giving the formula (Ba<sub>0.30</sub>Sr<sub>0.22</sub>Ca<sub>0.05</sub>Ce<sub>0.04</sub>Na<sub>0.03</sub>Fe<sub>0.02</sub>K<sub>0.01</sub>Th<sub>0.01</sub>) (Nb<sub>1.83</sub>Ta<sub>0.004</sub>Ti<sub>0.17</sub>)O<sub>5.61</sub>(H<sub>2</sub>O)<sub>0.80</sub>, or A<sub>0.68</sub>B<sub>2</sub>O<sub>5.61</sub>(H<sub>2</sub>O)<sub>0.80</sub>. D.T.A. study showed a large endothermic peak at 540°, and larger exothermic peaks at 800° and 820°. A dehydration curve showed complete loss of water below 350°.

The mineral is yellowish-gray to light olive-gray. It occurs in small enohedral crystals (largest 800) showing an octahedron with small cube faces. Hardness 550 (Vickers hardness no.) = 4½–5. Fracture conchoidal, a very poor {111} cleavage was seen in polished section. *G*. 4.00 (dried at 110°), calculated from *x*-ray data 4.01. Radioactive. Isotropic with *n* mostly 2.08–2.09, but some crystals have 2.07–2.08, some 2.09–2.10. Reflectivity 13.2%.

Rotation and Weissenberg photographs show no indication of deviations from the pyrochlore structure. From powder data,  $a=10.562 \pm 0.006$  Å. The strongest lines are (av. of 2 samples) 3.045 (100), 6.10 (80), 1.865 (70), 1.591 (70).

The name is for the locality, Panda Hill, and is suggested for minerals of the pyrochlore group with Ba predominant in the *A* position. The material here described is a strontian pandaite.

M. F.

### Avicennite

KH. N. KARPOVA, E. A. KON'KOVA, E. D. LARKIN, AND V. F. SAVEL'EV. Avicennite, a new mineral. *Doklady Akad. Nauk. Uzbekistan S.S.R.* 1958, No. 2, 23–26 (in Russian).

The mineral occurs in crystals less than 1 mm. in size, somewhat resembling perovskite. Color grayish-black, luster metallic, streak grayish-black; very brittle, fracture uneven, cleavage indistinct. It dissolves with difficulty in acids. Microchemical analysis on 4.3 mg. gave Ti<sub>2</sub>O<sub>3</sub> 88.86, Fe<sub>2</sub>O<sub>3</sub> 4.46%, FeO none. Spectrographic analysis showed also Sb, Pb—little; Sn, Ti, Mn, Ca, V, Al—very little; Si, Mg, Cu—trace. The formula is given as 7 Ti<sub>2</sub>O<sub>3</sub>·Fe<sub>2</sub>O<sub>3</sub>.

*X*-ray study of V. F. S. showed the mineral to be cubic with  $a_0$  9.12 Å. The *x*-ray powder

pattern (indexed) gave 49 lines, of which the 9 strongest are stated to agree well with the lines for synthetic  $Tl_2O_3$ .

The mineral occurs near the village of Dzhuzumli, Mt. Zirabulaksk region, Bukhara, in a hematite—calcite vein cutting banded marmorized and silicified limestones near their contact with granite-gneisses of the Ketmenchinsk intrusive. The veins contain coarsely crystalline limestone, densely impregnated with iron oxides, iron-rich clays, and hematite.

The name is for Abu Ali ibn Sina (Avicenna) (980–1037 A.D.), Arab physician and scientist, who lived in Bukhara.

DISCUSSION. The x-ray powder data agree well with those of the A.S.T.M. file for  $Tl_2O_3$ , but the indexing is entirely different, leading to  $a_0$  10.543 Å. The mineral should be classed with bixbyite, Dana's System Group 445, 7th Ed., Vol. I, p. 550.

M. F.

### Nasledovite

M. R. ENIKEEV. A new mineral, nasledovite, from the Altyn-Topkansk ore field. *Doklady Akad. Nauk Uzbek. S.S.R.* 1958, No. 5, 13–16 (in Russian).

Analysis by T. F. Mukhova gave PbO 23.51, MnO 14.97,  $MnO_2$  2.04, MgO 3.55, ZnO 0.73,  $Al_2O_3$  19.72,  $Fe_2O_3$  1.34,  $SO_3$  4.60,  $CO_2$  18.40,  $H_2O^-$  0.60,  $H_2O^+$  9.80,  $SiO_2$  1.58, sum 100.84%. After deduction of  $SiO_2$  and  $MnO_2$  as impurities, this corresponds to Pb 0.3 (Mn, Mg) 0.2  $Al_2O_3 \cdot 0.5 SO_2 \cdot 4 CO_2 \cdot 5 H_2O$ . Spectrographic analysis showed also 0.0n% Co, Cu, and Ti.

The mineral occurs as oölites 2–3 mm. in size, consisting of snow-white radiating fibers with silky luster, covered by a fine film of dark-brown to reddish material. Hardness 2, G. 3.069. The fibers show wavy extinction;  $\gamma$  1.591,  $c:\gamma = 2-23^\circ$ . The D.T.A. curve, by E. E. Rabaeva, shows a small endothermic effect at  $120^\circ$ , a large one at  $605^\circ$ , and a small exothermic effect at  $770^\circ$ .

The x-ray powder diagram, by L. A. Sokolova, shows 21 lines; the strongest are 3.261 (10), 2.028 (6), 2.019 (6), 1.462 (6), and 2.853 (5).

The mineral occurs as a fissure filling in altered granodiorite porphyries that enclose polymetallic ores at Sardob, eastern part of Altyn-Topkansk ore field, Kuraminsk Mountains. The oölites occur in sooty pyrolusite and ocherous iron oxide with crystals of cerussite.

The name is for Professor B. N. Nasledov, "tireless investigator of the mineral resources of Kara-Mazar."

DISCUSSION. Perhaps to be grouped with the basic lead aluminum carbonate dundasite, Dana's System, 7th Ed., Vol. II, p. 279.

M. F.

### Satpaevite, Al'vanite

E. A. ANKINOVICH. The new vanadium minerals satpaevite and al'vanite. *Zapiski Vses. Mineralog. Obshch.*, 88, No. 2, 157–164 (1959) (in Russian).

These two new aluminum vanadates were found in several mines of the Kurumsak and Balasauskandyk ore fields, in the oxidation zone of the vanadiferous clay-anthroxolite horizon of northwestern Kara-Tau.

#### Satpaevite

Analysis by T. L. Valeshina gave CaO 1.70, MgO 1.20,  $Al_2O_3$  32.00, 30.80,  $Fe_2O_3$  0.25,  $SiO_2$  (given as  $SiO_4$ ) 1.40,  $V_2O_4$  7.40, 7.30,  $V_2O_5$  27.70, 27.66,  $H_2O$  4.10,  $H_2O^+$  22.80, sum 98.55. This corresponds closely to  $6Al_2O_3 \cdot V_2O_4 \cdot 3V_2O_5 \cdot 30H_2O$ . Spectrographic analysis

gave also Zn 0.5, Cu 0.2, Ni 0.1, Cr 0.03, Ba 0.01. The mineral dissolves readily in cold dilute acids; in concentrated HCl it gives the characteristic reddish-brown solution of vanadates. When heated in a closed tube, it darkens to brownish-gray and gives off acid water. The D.T.A. curve gives sharp endothermal breaks at 90–210° and 290 and 350°, and a weak one at 600–620°C.

Satpaevite is canary- to saffron-yellow, occurring in floury aggregates of fine grains, but occasionally foliated and showing a perfect pinacoidal cleavage. Luster pearly on the cleavage, dull for fine-grained. G. 2.4. Hardness of dense aggregates 1½. Under the microscope, greenish-yellow to pale olive, partly isotropic, partly birefringent crystals of 0.05–0.1 mm., with  $ns \alpha' 1.676$ ,  $\gamma' 1.690$ , biaxial, positive,  $2V$  near 70°. Weakly pleochroic, Z deeper than X. Extinction parallel, orthorhombic (?). An electron microscope photograph by G. S. Gritsaenko shows platy form with rounded or hexagonal outline.

X-ray powder data by P. T. Tazhibaeva, E. M. Baigulov, G. I. Luk'Yantsev, and A. G. Kovalev are given for two samples. The strongest lines are 1.918, 1.926 (10); 2.330, 2.336 (9); 1.471, 1.469 (8); 3.905, 3.905 (7); 5.86, 5.87 (6). The pattern differs distinctly from that of steigerite, the only previously known aluminum vanadate, and from al'vanite.

Satpaevite occurs at depths of not more than 0.5–1.5 meters in a decomposed tremolite-carbonaceous shale, as veinlets and crusts. Associated minerals are gypsum, steigerite, hewettite, and delvauxite, all of which it cuts.

The name is for the Kazakhstan geologist Kanysh Imantaevich Satpaev.

DISCUSSION. H. T. Evans, Jr., points out that one would expect a mineral containing both  $V^{+4}$  and  $V^{+5}$  to be bluish-black.

#### *Al'vanite*

Analysis by T. L. Valeshima gave CaO 0.5, MgO 0.5, ZnO 0.5, NiO 2.7 (given as Ni, but the mol. ratio corresponds to NiO. MF),  $Al_2O_3$  39.6, 39.4,  $Fe_2O_3$  trace,  $V_2O_5$  not detected,  $V_2O_4$  3.7, 3.8,  $V_2O_3$  24.1, 24.3,  $SiO_2$  1.8,  $H_2O^-$  0.4, 0.6,  $H_2O^+$  25.6, 25.2, sum 99.4. This corresponds to  $3Al_2O_3 \cdot V_2O_5 \cdot 11H_2O$  or  $Al_6(VO_4)_2(OH)_{12} \cdot 5H_2O$ . Soluble in HCl and  $HNO_3$  only when heated. When heated in the closed tube, it gives off much acid water and turns brown.

The mineral is light bluish-green to bluish-black, streak white. Luster vitreous, pearly on the cleavage. Hardness 3–3½, G. (suspension) 2.41. Biaxial, neg.,  $2V$  80–85°,  $ns \alpha 1.658$ ,  $\gamma 1.714$ . Dispersion strong,  $r < v$ . Both positive and negative elongation were observed.

The mineral occurs in mica-like platelets of hexagonal form. Measurements by V. Yu. Duletkulov showed the faces  $c$  (001),  $b$  (010),  $a$  (100), and  $d$  (101), and showed the mineral to be monoclinic with  $\beta$  115°. The axial ratio was not determined. Cleavage (010) perfect. Under the microscope, polysynthetic twinning was observed with twinning plane parallel to the cleavage plane. X:cleavage = 14°.

X-ray powder data by P. T. Tazhibaeva and E. M. Baigulov are given; the strongest lines are 4.477 (10), 1.484 (9), 1.982 (8), 1.911 (6), 4.80 (5), and 1.686 (5).

The name is for the composition.

M. F.

#### Kivuite

L. VAN WAMBEKE. Contribution à l'étude de la minéralisation radioactive de la pegmatite de Kobokobo et description d'une nouvelle espèce minérale radioactive de la série phosphuranylite—renardite: la kivuite. *Bull. soc. belge geol., paléontol., et hydrol.*, **67**, 383–403 (1958) (publ. 1959).

The mineral occurs in the Kobokobo pegmatite, Kivu, as yellow earthly masses associated with uraninite, cyrtolite, colombotantalite, and apatite. Analysis by Poncin of material kept in a desiccator for 24 hours gave CaO 0.60, PbO 1.84,  $ThO_2$  8.32,  $UO_3$  62.90,

$P_2O_5$  6.04,  $H_2O^-$  6.24,  $H_2O^+$  (at 450° C.) 8.09, sum 94.03%. The remainder is stated to have consisted of at least 4% cyrtolite plus some columbotantalite. X-ray fluorescence analysis also showed 0.1–0.2% BaO, 0.1–0.2%  $As_2O_5$ , traces of Be. The formula is approximately  $(Th, Ca, Pb)H_2(UO_2)_4(PO_3)_2(OH)_8 \cdot 7H_2O$  and the mineral is therefore the thorium analogue of phosphuranylite (Ca) and renardite (Pb). The mineral is decomposed by  $HNO_3$ , nearly all the uranium, but only a little thorium and lead going into solution. The Th in the residue is not attacked by HF. The mineral does not fluoresce. Indexed x-ray powder data on the analyzed mineral and on an unanalyzed Pb-rich variety are very close to those of phosphuranylite. The strongest lines are 10.27 vs, 7.96 s-vs, 3.08 s, 2.87 s, 5.88, 4.43, 3.94, 3.86. The unit cell is calculated to be  $a_0$  15.88,  $b_0$  17.24,  $c_0$  13.76 Å.

Both the analyzed mineral and the Pb-rich variety are optically uniaxial to biaxial, negative,  $2V$  0–5°, pleochroism X colorless, Y and Z greenish-yellow,  $r > v$ . For analyzed kivuïte,  $\alpha$  1.618 ± 0.002,  $\beta$  1.654–1.655,  $\gamma$  1.655 ± 0.003; the Pb-rich variety had  $\alpha$  1.675 ± 0.003,  $\beta = \gamma = 1.705 \pm 0.005$ .

The name is for the Kivu region.

DISCUSSION. The analysis is unsatisfactory, because one cannot tell how the impurities were deducted. Needs confirmation and tests for homogeneity, in view of the behavior with nitric acid.

M. F.

#### Idaite

GERHARD FRENZEL. Ein neues Mineral: Idait, natürliches  $Cu_3FeS_6$  Neues Jahrb. Mineral., Abhandl., 93, p. 87–114 (1959).

This is the full account; a preliminary paper was abstracted in *Am. Mineral.*, 43, 1219 (1958). X-ray powder data are given.

M. F.

#### Igdloite

MARIANNE DANØ AND HENNING SØRENSEN. An examination of some rare minerals from the nepheline syenites of South West Greenland. *Meddelelser om Grønland* 162, No. 5, 1–35 (1959).

The mineral occurs in lujavrite rock at Igdlunguaq, Greenland, in white masses and small bands associated with neptunite, analcime, altered eudialyte, and rarely with sphalerite. It is isotropic, but centers of grains are often anisotropic;  $n$  very high. Spectrographic analysis shows it to be rich in Ti, Nb, Na, Ca, Al, and to have traces of Sr and Ba. Rare earths were not looked for. The x-ray pattern (not given) is of the perovskite type, but  $a = 3.89$  Å, a little larger than for perovskite. The pattern is very similar to that of  $NaNbO_6$ . Further work is in progress. The name is for the locality.

DISCUSSION. A premature name.

M. F.

#### Hsiang-hua-shih

WEN-HUI HUANG, SHAO-HUA TU, K'UNG-HAI WANG, CHUN-LIN CHAO, AND CHENG-CHIH YU. Hsiang-hua-shih, a new beryllium mineral. *Ti-chih-yueh-k'an*, 7, 35 (1958) (in Chinese). (From an abstract kindly prepared by E. C. T. Chao.)

Analysis gave  $BeO$  15.78,  $SiO_2$  25.66,  $CaO$  34.6,  $Li_2O$  5.85,  $F$  7.81%, stated to yield the formula  $Ca_3Be_3Li_2Si_3O_{12}F_2$ . The mineral occurs in white tris octahedral or dodecahedral crystals and granular masses,  $G$  2.9–3.0,  $H$   $6\frac{1}{2}$ , luster vitreous, transparent to translucent,  $n$  1.6132. X-ray powder data (not given) show it to be cubic, space group  $I4_3$ ,  $a_0$  12.879 ± 0.004 Å,  $Z = 8$ .

The mineral occurs in phlogopite veins in the light-colored band of green and white banded metamorphosed Devonian limestone in Hunan Province. The limestone is intruded by granite. In the green band was found taaffeite (Be Mg Al<sub>4</sub>O<sub>8</sub>) (see *Am. Mineral.* **37**, 360 (1952)).

The Chinese name means fragrant flower.

DISCUSSION. Very interesting, if true, but an inadequate description. Nothing is said of the missing part of the analysis (more than 10%). One wonders whether B and Al were tested for. The analysis as given gives the ratio 3CaO·3BeO·Li<sub>2</sub>O·2SiO<sub>2</sub>·2F (not 3SiO<sub>2</sub>).

M. F.

### Hydroantigorite

J. ERDELYI, V. KOBLENCZ, AND N. S. VARGA. Neuere strukturelle Regeln der Hydroglimer. Hydroantigorit, ein neues Serpentinmineral und metakolloidaler Brucit vom Csodi-Berg bei Dunabogdany (Ungarn): *Acta geol. acad. sci. Hung.*, **6**, 65-93 (1959).

Pale rose material, occurring at the contact of andesite with brucite, had G. 2.42. Analysis gave SiO<sub>2</sub> 42.25, Al<sub>2</sub>O<sub>3</sub> 0.29, Fe<sub>2</sub>O<sub>3</sub> 0.25, FeO 0.31, MnO 0.05, MgO 39.71, CaO 0.54, K<sub>2</sub>O trace, Na<sub>2</sub>O 0.02, P<sub>2</sub>O<sub>5</sub> trace, CO<sub>2</sub> 0.46, H<sub>2</sub>O<sup>-</sup> 3.21, H<sub>2</sub>O<sup>+</sup> 13.02, sum 100.31%. After deducting calcite, H<sub>2</sub>O<sup>-</sup> and 0.43% SiO<sub>2</sub> as quartz (not seen in the sample), the analysis is calculated to the formula:



The "excess" OH over the usual formula is balanced by the deficit in octahedral position; D. T. A. and x-ray powder data are given. The latter show that the mineral is identical with "ortho-antigorite" of Brindley and v. Knorring (*Am. Mineral.* **39**, 794-804 (1954)). It is monoclinic, *a*<sub>0</sub> 9.23, *b*<sub>0</sub> 9.17, *c*<sub>0</sub> 14.48 Å, β 91°27'.

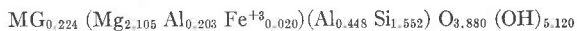
DISCUSSION. The formula above is presumably calculated on the assumption that all water determined as H<sub>2</sub>O<sup>+</sup> is present as hydroxyl. That this is incorrect is so well known that discussion seems unnecessary. But if it were true, does a 5% excess of (OH) justify a new name? I think not.

M. F.

### Hydroamesite

J. ERDELYI, V. KOBLENCZ, AND N. S. VARGA. Hydroamesit, ein neues Mineral aus den Hohlraumen des Basaltes von dem Halap-Berge am Plattenseegebiet (Komitat Veszpreme): *Acta geol. acad. sci. Hung.*, **6**, 95-106 (1959).

Cavities in basalt were filled with white, porcelain-like masses, G. 2.35. Optical study showed the material to be faintly anisotropic (birefringence 0.001), but to contain fibers of chrysotile. Analysis gave SiO<sub>2</sub> 32.32, TiO<sub>2</sub> trace, Al<sub>2</sub>O<sub>3</sub> 11.50, Fe<sub>2</sub>O<sub>3</sub> 0.56, FeO 0.15, MgO 32.61, MnO 0.13, CaO 2.01, K<sub>2</sub>O 0.03, Na<sub>2</sub>O 0.02, P<sub>2</sub>O<sub>5</sub> 0.06, H<sub>2</sub>O<sup>-</sup> 3.13, H<sub>2</sub>O<sup>+</sup> 15.98, CO<sub>2</sub> 1.84, sum 100.34%. After deducting calcite and H<sub>2</sub>O<sup>-</sup> the formula is calculated to be:



Alternative calculations require Al(OH)<sub>3</sub> or Mg(OH)<sub>2</sub> to be assumed; the D.T.A. curve shows no breaks corresponding to their presence. X-ray powder indicate the mineral to be monoclinic, *a*<sub>0</sub> 5.27, *b*<sub>0</sub> 9.20, *c*<sub>0</sub> 14.60 Å, β 90°59'.

DISCUSSION. See preceding remarks under Hydroantigorite. It seems likely that this gel-like material would contain appreciable amounts of non-essential water. A static dehydration curve would be interesting.

M. F.



**Hydroparagonite**

In *Am. Mineral.*, **43**, 1222 (1958), I criticized the re-naming of brammallite as hydroparagonite. J. Erdelyi has now replied in *Acta. geol. acad. sci. Hung.*, **6**, 273-274 (1959) that Bannister described brammallite as a sodium-illite, which it is not, and therefore it was proper to re-name it. But Bannister's description of the mineral was correct; even if his classification of it was incorrect, which I do not concede, this is not a valid reason for changing the name.

M. F.

## NEW DATA

**Kesterite (=Zn analogue of stannite)**

V. V. IVANOV AND YU. A. PYATENKO. On the so-called kesterite. *Zapiski Vses. Mineral. Obshch.*, **88**, No. 2, 165-168 (1959) (in Russian) (see *Am. Mineral.* **43**, 1222-1223) (1958).

Re-examination of type material from the Kester deposit, Yakutsk A.S.S.R. showed it to be the zinc analogue of stannite. A new analysis by L. E. Novorossov on optically homogeneous material gave Cu 26.69, Ag 0.49, Zn 10.32, Fe 2.62, Sn 31.80, S 27.58, In 0.021, insol. 0.36, sum 99.88 per cent, corresponding to  $\text{Cu}_{1.98}(\text{Zn}, \text{Fe})_{0.95}\text{Sn}_{1.25}\text{S}_4$ . X-ray study showed it to be tetragonal with  $a$  5.43,  $c$  10.86 Å. An indexed x-ray powder pattern is given. It is suggested that this may be a partly disordered phase, intermediate between normal tetragonal stannite and cubic isostannite, and that the formula should perhaps be written  $(\text{Cu}, \text{Sn})_3(\text{Zn}, \text{Fe})\text{S}_4$ . Color greenish-black, streak black, H 4.4, G 4.54-4.59.

DISCUSSION. The authors consider the name superfluous for a zinc-bearing stannite, but if stannite is  $\text{Cu}_2\text{FeSnS}_4$  this is the zinc analogue and would normally be given a special name. The name kesterite is objectionable because of confusion with custerite.

M. F.

## DISCREDITED MINERALS

**Erikite (=Monazite)**

MARIANNE DANØ AND HENNING SØRENSEN. An examination of some rare minerals from the nepheline syenites of South West Greenland. *Meddelelser om Grønland* **162**, 5, 1-35 (1959).

X-ray powder data are given for the type material from Nunarssuatsiaq, Greenland, described by Bøggild (*Medd. Grønland* **26**, 93-139 (1904)); they are identical with those for monazite. The goniometric data by Bøggild are discussed; they fit fairly well those for eudialyte, and erikite is therefore probably a pseudomorph of monazite after eudialyte. Erikite from the Kola Peninsula (see Gerasimovskii, *Mineralog. Abs.*, **8**, 222 (1942)) has optical properties very different from those of monazite and is apparently not identical with the Greenland material.

M. F.

**Igalikite****(=mixture of Analcime + Muscovite 1 M)**

MARIANNE DANØ AND HENNING SØRENSEN. An examination of some rare minerals from the nepheline syenites of South West Greenland. *Meddelelser om Grønland*, **162**, No. 5, 1-35 (1959).

Re-examination of the type material described by Bøggild (see *Am. Mineral.* **20**, 138 (1935)) by the x-ray powder method (data given) showed it to be an alteration product of nepheline, consisting of analcime and a muscovite-like mineral, nearest to muscovite 1 M. The lithium content is 50 ppm.

M. F.