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NEW MINERAL NAMES*

John L. Jambor
Department of Earth Sciences, University of Waterloo, Waterloo, Ontario, N2L 3G1, Canada
Edward S. Grew
Department of Geological Sciences, University of Maine, Orono, Maine 04469, U.S.A.

Antimonselite*

Luming Chen, Qifa Zhang, Deren Li, Guanxin Wang (1993) Antimonelite: A new mineral. Acta Mineral. Sinica, 13(1), 7–11.

The mean and range of fourteen electron microprobe analyses are Sb 47.32 (43.78–51.14), Hg 2.35 (0.94–4.78), Cu 0.61 (0.10–2.43), As 0.19 (0.0–0.42), Se 48.91 (48.60–49.72), S 0.13 (0.0–0.71), sum 99.54 (98.07–101.76) wt%, corresponding to $(Sb_{1.87}Hg_{0.06}Cu_{0.05}As_{0.01})_{\Sigma 1.99}(Se_{2.99}S_{0.02})_{\Sigma 3.01}$, ideally Sb_2Se_3. Occurs as black anhedral grains and as radiating acicular crystals, typically <20 μm and to a maximum of 21 × 23 μm. Metallic luster, black streak, VHN_{30} = 120, D_{calc} = 5.88 g/cm^3 for $Z = 4$. White in reflected light, distinct bireflectance, distinct pleochroism from white to grayish white, distinct anisotropism. Reflectance percentages (SiC standard) are given in 10-nm steps from 420 to 700 nm for R'_α and R'_γ; values at 470, 546, 589, and 650 nm are, respectively, 42.62, 40.55; 41.95, 39.02; 42.23, 39.42; 44.39, 41.56. The X-ray powder pattern, similar to those of stibnite and synthetic Sb_2S_3, has strongest lines of 3.70(70,130), 3.17(50,211), 2.870(100,221), 2.625(60,240), and 1.746 Å (35,601); by analogy the new mineral is orthorhombic, space group *Pbnm*, $a = 11.593(3)$, $b = 11.747(3)$, $c = 3.3984(1)$.

The mineral occurs with pyrite, sphalerite, galena, ferroselite, clausthalite, uraninite, and others in U-bearing calcite veins in a U-Hg-Mo polymetallic deposit at Kaiyang, Guizhou Province, China. The new name alludes to the composition, which represents the Se analogue of stibnite. Type material is in the Chinese Museum of Geology (in Guizhou?). **J.L.J.**

Germanocolusite*

E.M. Spiridonov, V.M. Kachalovskaya, V.V. Kovachev, L.Ya. Krapiva (1992) Germanocolusite $Cu_{26}V_2(Ge,As)_6S_{32}$: A new mineral. Vestnik Moskovskogo Universiteta, Seriya 4, Geologiya, 1992(6), 50–54 (in Russian).

Electron microprobe analyses of specimens from Urup, Tsumeb, and Chelopech gave, respectively: Cu 49.69, 49.22, 48.04, Ag 0.13, 0, 0.09, Fe 0.47, 1.56, 1.54, Zn 0.91, 0.15, 1.28, V 3.32, 3.19, 3.17, Ge 8.62, 6.55, 9.13, Ga 0, 0.35, 0.17, As 5.09, 5.90, 3.38, Sb 0.08, 0.12, 0.40, Sn 0.14, 0.06, 1.33, Mo 0.67, 1.18, 0, W 0.03, 0.06, 0, Bi 0.15, 0, 0, S 32.10, 31.97, 31.05, Se, 0, 0, 1.08, sum 101.40, 100.31, 100.66 wt%. Normalized to 66 atoms these analyses correspond, respectively, to $(Cu_{25.0}Fe_{0.3}Zn_{0.4})_{\Sigma 25.7}V_{2.1}(Ge_{3.8}As_{2.2}Mo_{0.2})_{\Sigma 6.2}S_{32}$, $(Cu_{24.9}Fe_{0.9}Zn_{0.1})_{\Sigma 25.9}V_{2.0}(Ge_{2.9}Ga_{0.2}As_{2.5}Mo_{0.4})_{\Sigma 6.0}S_{32.1}$, and $(Cu_{24.5}Fe_{0.9}Zn_{0.6})_{\Sigma 26.0}V_{2.0}(Ge_{4.1}Ga_{0.1}As_{1.5}Sb_{0.1}Sn_{0.4})_{\Sigma 6.2}(S_{31.4}Se_{0.4})_{\Sigma 31.8}$, ideally $Cu_{26}V_2(Ge,As)_6S_{32}$. The mineral forms single grains or equant to elongate segregations <1–100 μm across. No cleavage, unaffected by standard chemical reagents, VHN_{40} = 330 (range 280–370, Urup), D_{calc} = 4.55 g/cm^3 for Z = 1 (Urup). In reflected light, isotropic, no internal reflection; color is yellow, grayish yellow, greenish yellow, olive yellow, cream yellow, less commonly yellowish cream with a rose to brownish rose tint. Reflectance values (Si standard in air) are given in 20-nm intervals (or less) from 400 to 700 nm; representative values for Urup and Tsumeb are (470 nm) 23.8, 25.4%, (546) 27.3, 29.5, (589) 27.9, 30.9, (650) 27.9, 31.5. Powder X-ray data (Fe*Kα*, 114-mm camera), indexed by analogy with colusite (which has isometric symmetry, space group $P\bar{4}3m$), gave a = 10.568(3) Å. Strongest lines (30 given) are 3.05(100,222), 2.64(40,400), 1.870(50,440), 1.595(30,622), 1.320(30,800), 1.212(30,662), 1.079(30,844), and 1.017(30,666,10.2.2).

The mineral occurs in late bornite and tennantite mineralization of the polymetallic deposits Urup (Northern Caucasus, Russia), Maykain (northeastern Kazakhstan), Tsumeb (Namibia), and Chelopech (Bulgaria). At Urup and Maykain, the new mineral is commonly mantled by one or two of the following: renierite, mawsonite, chalcopyrite, and chalcocite. The mineral occurs mostly in bornite, less commonly in tennantite, sphalerite, barite, pyrite, galena, chalcocite, luzonite, stromeyerite, stephanite, and chalcopyrite. Occurs at Tsumeb in tennantite, sphalerite, and chalcopyrite ore with germanite, gallite, chalcocite, enargite, and bornite. Occurs at Chelopech with enargite, bornite, luzonite, germanite, renierite, mawsonite, and hemusite. The new name is for a colusite with Ge > Sn,As(+Sb). A specimen from Urup has been deposited in the Fersman Mineralogical Museum, Moscow, Russia. **E.S.G.**

Kamphaugite-(Y)*

G. Raade, K. Brastad (1993) Kamphaugite-(Y), a new hydrous Ca-(Y,REE)-carbonate mineral. Eur. Jour. Mineral., 5, 679–683.

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

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C. Rømming, A.K. Kocharian, G. Raade (1993) The crystal structure of kamphaugite-(Y). Eur. Jour. Mineral., 5, 685–690.

Electron microprobe and CHN analyses gave CaO 18.4, Y_2O_3 30.5, Nd_2O_3 1.4, Sm_2O_3 0.8, Gd_2O_3 1.6, Dy_2O_3 2.1, Er_2O_3 1.2, Yb_2O_3 1.1, CO_2 29.6, H_2O 12.1, sum 98.8 wt%, corresponding to $Ca_{1.95}(Y_{1.61}REE_{0.27})_{\Sigma 1.88}(CO_3)_{4.00}(OH)_{1.54}\cdot 3.22H_2O$, simplified as $Ca_2(Y,REE)_2(CO_3)_4(OH)_2\cdot 3H_2O$. Occurs as crystals of roughly square outline, up to 1 mm across, platy on {001} and typically divergent, roselike, or spherulitic. White to colorless, with some spherules pale yellow to pale brown; white streak, transparent, vitreous luster, nonfluorescent, H = 2–3, uneven fracture, no cleavage, effervesces in dilute acids, D_{meas} = 3.19(5), D_{calc} = 3.24 g/cm³ for Z = 4. Anomalously optically biaxial negative, $2V \approx 15°$, $\alpha = 1.627(2)$, $\beta \approx \gamma = 1.663(2)$, $X = c$. Single-crystal X-ray structure study (R = 0.067) indicated tetragonal symmetry, space group $P4_12_12$, a = 7.434(1), c = 21.793(3) Å. The structure study indicated that the ideal formula is $8[CaY(CO_3)_2(OH)\cdot H_2O]$. Strongest lines of the Debye-Scherrer powder pattern ($FeK\alpha_1$ radiation) are 6.140(100,102), 4.381(80,104), 3.516(60,202), 2.831(50,214), 2.631(90,220), and 1.891(30,228).

The mineral occurs in cavities of a magnetite and helvite skarn at Hørtekollen, Oslo region, Norway, and as a fine-grained alteration product of kuliokite-(Y) at the Høydalen amazonite pegmatite, Tørdal, Norway; also known as well-crystallized rosettes in the Tangen granite pegmatite near Kragerø, Norway, and previously reported as an unnamed mineral replacing gagarinite from Kazakhstan, as white crusts at the Evans-Lou pegmatite, Quebec, Canada, and as white spheroids on opal from a quartz and barite vein, Transvaal, South Africa. The new name is for Erling Kamphaug (b.1931), mineral collector, who supplied the original specimens. Type material (Hørtekollen) is in the Mineralogical-Geological Museum, University of Oslo, Norway. **J.L.J.**

Manganoparawollastonite

Yunfen Lei, Yueying Lin, Dequan Zhang, Wuyi Wang (1993) The first discovery of manganoparawollastonite. Acta Mineral. Sinica, 13(1), 79–83 (in Chinese, English abs.).

Electron microprobe analysis (highest MnO content of the nine analyses reported) gave SiO_2 49.54, CaO 33.17, MnO 13.26, FeO 3.66, MgO 0.08, Al_2O_3 0.03, sum 99.74 wt%, corresponding to $(Ca_{0.71}Mn_{0.23}Fe_{0.06})_{\Sigma 1.00}Si_{1.00}O_3$. The mineral occurs as columnar, radial, and granular grains typically 0.03–0.12 mm; colorless, vitreous luster, VHN = 300–350, perfect {100} cleavage, D_{meas} = 2.99 g/cm³. Optically biaxial negative, α = 1.631–1.635, β = 1.629–1.633, γ = 1.614–1.621, $Z \wedge c = 38°$, $2V_{meas}$ = 35–40°. Strongest lines of the X-ray powder pattern (Cu radiation, diffractometer) are 3.447(58,311), 3.331(100,20$\bar{2}$), 3.261(81,220), 3.223(64,021), 3.040(71,112), and 3.003 Å (89,22$\bar{1}$); calculated cell dimensions are a = 14.721(3), b = 7.049(3), c = 6.906(3), β = 95.827(30)°. The mineral, which is from a Pb- and Zn-bearing skarn deposit in Inner Mongolia, China, is an intermediate member between $CaSiO_3$ and $MnSiO_3$.

Discussion. The mineral should not have been given a new name and should have been described as manganoan wollastonite-2*M*. **J.L.J.**

Mozartite*

A. Palenzona, A. Pozzi (1993) Mozartite, a new mineral species from Cerchiara, La Spezia. Revista Mineral. Ital., no. 2, 1993, 79–82 (in Italian, English abs.).

A. Basso, G. Lucchetti, L. Zefiro, A. Palenzona (1993) Mozartite, $CaMn(OH)SiO_4$, a new mineral species from the Cerchiara mine, northern Appenines, Italy. Can. Mineral. 31, 331–336.

The mean of sixteen electron microprobe analyses gave MgO 0.05, CaO 27.08, Al_2O_3 0.49, Mn_2O_3 38.72, SiO_2 29.25, sum 95.59 wt%, corresponding to $Ca_{0.98}(Mn_{1.00}Al_{0.02})(OH)Si_{0.99}O_{4.00}$. The H_2O was inferred from single-crystal X-ray structure analysis (R = 0.027). Occurs as aggregates of anhedral grains, 0.1–0.5 mm; also as subhedral, stocky prismatic crystals elongate [100]. Transparent, vitreous luster, deep red color, red streak, no cleavage, conchoidal fracture, hardness not determinable, nonfluorescent, D_{meas} = 3.64(4), D_{calc} = 3.68 g/cm³ for Z = 4. Optically biaxial positive, α = 1.840(5), β = 1.855(5), γ = 1.920(5), $2V_{meas}$ = 50(2)°, $2V_{calc}$ = 52.8°, strongly pleochroic with X = yellow-brown, Y = yellow, Z = orange-red. Orthorhombic symmetry, space group $P2_12_12_1$, a = 5.838(1), b = 7.224(1), c = 8.690(1) Å. Strongest lines of the X-ray powder pattern (Guinier camera, $CuK\alpha$ radiation, calculated intensities) are 5.558(86,011), 3.613(37,020), 3.070(73,120), 2.584(100,211), 2.509(36,122), 2.441(35,113), and 1.565(51,233).

The mineral, which is the Mn analogue of vuagnatite $CaAl(OH)SiO_4$, is associated with pectolite, calcite, quartz, and hausmannite that fill large veins that crosscut massive braunite interbedded with metacherts at the Cerchiara mine near Faggiona, La Spezia, eastern Liguria, Italy. The new name is for Wolfgang Amadeus Mozart (1756–1791); the initial discovery was made in 1991, the 200th anniversary of Mozart's death. Type material is in the Sezione di Mineralogia, Dipartimento di Scienze della Terra, Università di Genova, Genoa, Italy. **J.L.J.**

Ni-chalcophanite

A.I. Gorshkov, G.R. Kapustkin, A.V. Sivtsov, I.M. Lazarenko, L.S. Dubrovinskiy (1992) Ni-chalcophanite: A new variety of the mineral from a weathering crust on ultramafic rocks of the Kempirsay massif (southern Urals). Izvest. Akad. Nauk, Ser. Geol., 1992(11), 108–117 (in Russian).

Electron microprobe analyses of two specimens gave

SiO_2 nil, MnO_2 65.28, 65.02, Al_2O_3 nil, Fe_2O_3 nil, Co_2O_3 0.32, 1.48, NiO 9.88, 10.63, CuO 2.98, 1.00, CaO nil, BaO 2.44, 2.14, K_2O 0.41, 0.34, CeO_2 0.35, 0.82, sum 81.66, 81.43 wt%; assumed H_2O 18.34, 18.57 wt%. Normalizing the average of these two analyses to four cations, assuming that Ce is present in a cerianite impurity, and correcting for hollandite impurity, gave $(Ni_{0.65}Cu_{0.12}Co^{3+}_{0.05})_{\Sigma 0.82}Mn_{3.18}O_{7.02}\cdot 4.84H_2O$ [sic]. The mineral forms radial aggregates several tenths of a millimeter across, or isolated needles that fill cavities, in most cases intergrown with hollandite. Under the electron microscope, the mineral appears as well-faceted pseudohexagonal platelets up to 10 μm across and 0.5–1.0 μm thick. Under the binocular microscope, druses of the mineral have a rich brown color and metallic luster. In reflected light, strongly bireflectant and anisotropic with color effect: R_0 = white with light blue tint, R_e = gray. No internal reflections. Extinction parallel to the cleavage, less commonly wavy. Perfect {001} cleavage. Reflectance values for 400–700 nm are approximately 23.5–27% for R_2 (maximum near 500 nm); for R_1, 13.5–18.5% (plotted only, no values listed). On the basis of electron diffraction patterns, the symmetry is inferred to be rhombohedral, space group $P\bar{3}$, $P3$, $P\bar{3}m$, or $P3m$. The X-ray data (Cu$K\alpha$, diffractometer) yield a = 7.53(2), c = 20.88(3) Å from the pattern; strongest lines are 6.91 (strong, 003), 4.06 (medium, 014), 3.46 (medium-weak, 006), 3.29 (weak, 113), 2.77 (weak, 204), 2.24 (medium, 124), 1.89 (weak, 220), 1.605 (medium-weak, 402), and 1.430 (weak, 234).

The mineral is one of the latest to form in infiltration nodules of manganese oxides from the nontronite horizon of an ancient weathering zone on ultramafic rocks of the Kempirsay massif (Kamennyy Kobchik deposit, southern Urals, Russia). Associated minerals are asbolane, lithiophorite, hollandite, and cerianite. These minerals form fine layers in cavities that resulted from shrinkage.

Discussion. The number of O atoms in the formula cited above should be 7.205. If the average of the two analyses is corrected for a hollandite impurity of composition $(Ba,K)Mn_8O_{16}$, the resulting formula would be $(Ni_{0.74}Cu_{0.14}Co^{3+}_{0.06})_{\Sigma 0.94}Mn_{3.06}O_{7.09}\cdot 5.55H_2O$. This formula is closer to a stoichiometric Ni-dominant chalcophanite, $(Ni,Cu,Co)_{\Sigma 1.0}Mn_3O_7\cdot 3H_2O$, except for the excess of H_2O, which the authors attributed to adsorbed H_2O. **E.S.G.**

Ravatite*

L. Nasdala, I.V. Pekov (1993) Ravatite, $C_{14}H_{10}$, a new organic mineral species from Ravat, Tadzhikistan. Eur. Jour. Mineral., 5, 699–705.

The mineral occurs as a sublimation product from the natural combustion of a Middle Jurassic brown coal seam near Ravat, about 100 km north of Dushanbe, northwestern Tadzhikistan. CHN analysis gave C 93.41, H 5.51, sum 98.92 wt%, corresponding to $C_{14.1}H_{9.9}$, ideally $C_{14}H_{10}$, the natural analogue of the cyclic hydrocarbon phenanthrene. Occurs as thin platelike individuals of irregular shape, mostly a few hundred micrometers in size; aggregates form crusts generally <1 mm thick. Colorless to white to pale gray, translucent, vitreous to waxy luster, waxlike tenacity, perfect {001} cleavage, D_{meas} = 1.11(2), D_{calc} = 1.207(1) g/cm³ for Z = 2, whitish yellow fluorescence in ultraviolet light; TGA showed melting at 94.3 °C. The IR spectrum is in good agreement with that of synthetic phenanthrene. Optically biaxial with $2V \approx 90°$, $n_{min} \approx 1.75$, $n_{max} \approx 1.95$ (λ = 5145 Å). Single-crystal X-ray study indicated monoclinic symmetry, space group $P2_1$, a = 8.392(5), b = 6.181(3), c = 9.558(5) Å, β = 98.48(12)° as refined from a diffractometer powder pattern (Cu$K\alpha$ radiation), in good agreement with data for synthetic phenanthrene; strongest lines of the pattern are 9.434(100,001), 4.941(11,110), 4.724(11,002), 4.028 (13,20$\bar{1}$), and 3.371(10,21$\bar{1}$).

The new name alludes to the type locality, where the weathering of finely dispersed pyrite and the bacterial decay of coal have caused lignite seams to ignite spontaneously, reaching temperatures >800 °C. In the outermost, coolest thermal zone (60–25 °C), ravatite forms as a sublimation product with liquid bitumen and, rarely, native selenium. The type specimen is in the collection of the Freiberg Mining Academy, Freiberg, Germany. **J.L.J.**

Tsnigriite*

S.M. Sandomirskaya, Ch.Kh. Arifulov, M.M. Botova, N.N. Mozgova, S.N. Nenasheva, A.I. Tsepin, A.V. Sivtsov (1992) Tsnigriite $Ag_9SbTe_3(S,Se)_3$: A new mineral. Zapiski Vses. Mineral. Obsch., 121(5), 95–101 (in Russian).

Averages of six electron microprobe analyses of the mineral from Vysokovol'tnoye and of two analyses of the mineral from Bethumy gave, respectively, Ag 60.7, 59.95, Cu –, 0.04, Pb –, 1.84, Sb 7.7, 7.28, As –, 0.05, Bi –, 0.06, Te 24.4, 25.25, S 5.2, 6.08, Se 1.9, –, sum 99.9, 100.53 wt%. Normalized to 16 atoms, these correspond to $Ag_{8.99}Sb_{1.01}Te_{3.05}(S_{2.57}Se_{0.38})_{\Sigma 2.95}$ and $(Ag_{8.78}Cu_{0.01}Pb_{0.14})_{\Sigma 8.93}(Sb_{0.94}As_{0.01})_{\Sigma 0.95}Te_{3.13}S_{3.00}$, ideally $Ag_9SbTe_3(S,Se)_3$. Reflectance percentages (WTiC standard) are given from 420 to 700 nm for the Vysokovol'tnoye mineral, e.g., R_{max} and R_{min} (470 nm) 38.0, 34.2, (546) 36.6, 32.2, (589) 35.7, 31.8, (650) 34.0, 30.2, and from 420 to 740 nm for the Bethumy mineral, e.g., R_{max} (470 nm) 36.8, (546) 36.4, (589) 35.5, (650) 34.7. The mineral forms anhedral grains mostly a few tens of micrometers across, rarely up to 0.1 mm across; some grains from Bethumy have nearly rhombic cross sections. In reflected light, gray with a weak greenish blue hue, no internal reflection, bireflectance weak, anisotropic in brown and gray tones. VHN_{20} = 125. D_{calc} = 7.38 g/cm³ for Z = 4 (Bethumy). Electron diffraction study of single grains and powder X-ray diffraction data suggest monoclinic symmetry, space group $P2/m$ or Pm. The powder X-ray data (Fe$K\alpha$, 57.3-mm camera) gave for Vysokovol'tnoye and Bethumy, respectively, $a = 8.89(1)$, $b = 8.292(8)$, $c = 19.50(1)$ Å, $\beta = 97.02(3)°$, $Z = 4$. Strongest lines in the pattern for Bethumy (35 given) are 4.26(50,113), 3.78(70,022,$\bar{2}$12), 2.89(40,124,214), 2.85(40,025), 2.29(40,225), 2.20(100,400), 2.10(40,$\bar{4}$13,036), 2.00(40,141), 1.781(40,415,$\bar{5}$01), 1.708(40,$\bar{4}$33,$\bar{2}$.0.11), and 1.674(40,$\bar{4}$34,$\bar{2}$.1.11).

The mineral was found in the gold-silver deposit of Vysokovol'tnoye in the western part of the south Tian Shan fold belt, Uzbekistan, and subsequently in the polymetallic ore show of Bethumy, Rajasthan, India. At Vysokovol'tnoye, the mineral is a minor constituent in a late gold + hessite association as intergrowths with hessite and mercurian gold or with tellurian canfieldite; occurs also as interstitial grains or microveinlets in quartz and tetrahedrite + miargyrite aggregates. At Bethumy, the mineral is associated with galena, sphalerite, pyrrhotite, and falkmanite. The name is from the initials for the Russian name for the Central Scientific-Research Institute of Geological Prospecting in Moscow. The type specimen is in the Fersman Mineralogical Museum, Moscow, Russia. **E.S.G.**

$PtCu_5$, $(Pd,Cu)_9SnTe_2S_2$

A.Yu. Barkov, A.I. Lednev, Yu.P. Men'shikov (1992) Some regularities in the distribution and compositional variation of minerals of the platinum-group elements from the Lukkulaisvaara massif (northern Karelia). Doklady Akad. Nauk SSSR, 323(3), 539–544 (in Russian).

$PtCu_5$

Electron microprobe analysis gave Pt 36.84, Ag 0.22, Cu 62.86, sum 99.92 wt%, corresponding to $(Pt_{0.96}Ag_{0.01})_{\Sigma 0.97}Cu_{5.03}$. The mineral forms an overgrowth around rickardite in peridotite of the ultramafic zone of the Lukkulaisvaara massif, Russia.

$(Pd,Cu)_9SnTe_2S_2$

Electron microprobe analyses gave Pd 42.45, 42.10, 45.47, 42.04, Pt 1.96, 3.10, 2.80, 2.36, Ag –, –, 1.06, 6.91, Cu 18.24, 16.73, 12.79, 11.68, Fe 1.82, 2.44, 2.81, 3.29, Sn 9.64, 9.48, 9.74, 9.14, Te 20.54, 20.42, 20.41, 19.99, S 5.17, 5.17, 5.11, 4.93, sum 99.82, 99.44, 100.19, 100.34 wt%, corresponding to $(Pd_{4.93}Cu_{3.55}Fe_{0.40}Pt_{0.12})_{\Sigma 9.00}Sn_{1.00}Te_{1.99}S_{1.99}$, $(Pd_{4.95}Cu_{3.29}Fe_{0.55}Pt_{0.20})_{\Sigma 8.99}Sn_{1.00}Te_{2.00}S_{2.02}$, $(Pd_{5.42}Cu_{2.55}Fe_{0.64}Pt_{0.18}Ag_{0.12})_{\Sigma 8.91}Sn_{1.04}Te_{2.03}S_{2.02}$, and $(Pd_{5.02}Cu_{2.34}Ag_{0.81}Fe_{0.75}Pt_{0.15})_{\Sigma 9.07}Sn_{0.98}Te_{1.99}S_{1.95}$. Together with taimyrite and tulameenite, the mineral is selectively concentrated in chalcopyrite in plagioclase pyroxenite in the Lukkulaisvaara massif.

Discussion. The Pd mineral is probably the same as $(Pd,Cu,Pt,Fe)_9Sn(Te,S)_4$, also from the Lukkulaisvaara massif, that was abstracted in *Am. Mineral.* 78, p. 672 (1993). **E.S.G.**

Os_2S_3, Pd_3Hg_2, PdCuHg

Kai Yong, P.K. Seccombe (1993) Platinum-group minerals in the chromitites from the Great Serpentine Belt, NSW, Australia. Mineral. Petrology, 47, 263–286.

$(Os,Ir,Ru)_2S_3$

Forms a 20-μm composite inclusion with irarsite in unaltered chromite. Electron microprobe analysis gave Os 59.30, Ir 14.48, Ru 2.65, Pt 1.96, Fe 0.74, Cr 1.79, S 20.43, sum 99.35 wt%, corresponding to $(Os_{0.296}Ir_{0.062}Ru_{0.025}Pt_{0.010})_{\Sigma 0.393}S_{0.605}$, close to Os_2S_3. Also present is a phase of uncertain homogeneity and composition $(Ru,Os,Ir)_4S_5$.

$(Pd,Cu,Fe)_3Hg_2$ and (Pd,Rh)CuHg

Analysis of possible $(Pd,Cu,Fe)_3Hg_2$ and possible (Pd,Rh,Ru,Fe,Bi)CuHg gave, respectively, Hg 46.43, 50.00, Pd 33.68, 19.19, Ru –, 0.86, Rh –, 3.35, Fe 1.03, 1.79, Cu 0.65, 15.50, Cr 0.92, 3.45, Bi 0.72, 6.13, sum 83.43, 100.27 wt%. **J.L.J.**

(Bi,Pb,Pd)Te

F.L.C. D'Orey (1990) Plumbian-nickelian merenskyite and the phase (Bi,Pb,Pd)Te with traces of platinum, from Mondunguara, Mozambique. Garcia de Orta, Ser. Geol., Lisboa, 13(1–2), 35–41 (in Portuguese, English abs.).

Electron microprobe analysis gave Bi 40.8, Pb 18.1, Pd 2.3, Pt 0.3, Te 38.5, (sum 100 wt%), corresponding to (Bi,Pb,Pd)Te. The mineral occurs in contact with merenskyite and is optically isotropic; reflection percentages are 41.2, 45.3, 46.2, and 47.8 at 470, 546, and 650 nm, respectively.

Discussion. No X-ray data were given, but cubic BiTe is known as a synthetic phase (JCPDS-PDF 15–820). Possibly the cubic polymorph of tsumoite, BiTe. **J.L.J.**

Unnamed tetrahedrite-group mineral

Yu.Ya. Zhdanov, V.A. Amuzinskiy, N.G. Andrianov (1992) A natural variety of silver-rich tetrahedrite with a large unit-cell parameter. Doklady Akad. Nauk SSSR, 326(2), 337–340 (in Russian).

Electron microprobe analyses of six grains in six samples gave the following ranges (in parentheses, the analysis for one sample): Ag 51.05–54.21 (52.07), Cu 0.11(–), Fe 2.34–3.97 (2.54), Zn 1.04–2.38 (2.37), Hg 0.77–1.71 (1.37), Sb 20.10–21.41 (21.41), As 0.29–0.36 (0.29), S 17.42–19.40 (19.08), sum 97.68–99.80 (99.13) wt%; for 29 atoms the single analysis corresponds to $Ag_{10.40}(Fe_{0.99}Zn_{0.76}Hg_{0.15})_{\Sigma 1.90}(Sb_{3.80}As_{0.09})_{\Sigma 3.89}S_{12.81}$. The mineral forms aggregates 0.002–0.3 mm across. In reflected light, gray with a bluish hue. Very rare, dark cherry red internal reflections. Isotropic. Unaffected by light. The X-ray pattern corresponds to standard tetrahedrite patterns. The most intense lines, which have indices of 222, 400, 510, and 622, yield a = 10.92 Å for the sample with the formula cited above (line positions and intensities not given).

The mineral was found in the Khachakchan silver-ore occurrence in the Verkhoyan-Kolyma fold belt, Yakutia, Russia. Aggregates of the mineral fill cavities and fractures in siderite in association with argentian pyrite and tetrahedrite. The mineral also occurs in silver amalgam.

Discussion. The authors propose that the mineral represents a distinct series with tetrahedrite in which the a parameter increases with Ag content, in contrast to tetrahedrite-freibergite, in which the a parameter decreases with Ag (for Ag > 4 apfu). **E.S.G.**

Unnamed layer silicate

K.A. Lazebnik, N.V. Zayakina (1992) An unusual layer silicate from carbonate rocks of the "Lilac Stone" charoite deposit. Zapiski Vses. Mineralog. Obshch., 121(5), 81–87 (in Russian).

Electron microprobe analyses of six grains (cores) averaged SiO_2 44.18, TiO_2 0.43, Al_2O_3 5.19, Fe_2O_3 6.69, MgO 28.20, CaO 1.77, K_2O 0.23, Na_2O 0.39, F 0.50 (based on partial analyses), sum 87.58 wt%; H_2O is inferred to be 12.42 by difference, which leads to the formula $(K_{0.02}Na_{0.05}Ca_{0.14}Mg_{0.04})_{\Sigma 0.38}Mg_{3.0}[(Si_{3.12}Ti_{0.02}Al_{0.44}Fe_{0.36})_{\Sigma 2.94}O_{10}]\,(OH_{1.27}F_{0.12})_{\Sigma 1.39}\cdot 2.15H_2O$ [sic]. The grains are zoned, gradually increasing in K and decreasing in Ca and H_2O toward the margins, approaching the composition of intergrown phlogopite. The infrared spectrum has features in common but is not identical with that for mixed-layer silicates. The mineral forms light yellow flakes of hexagonal outline, 0.5–2.0 mm across; when viewed parallel to (001), the color is more intense and has a reddish brown tint. Cleavage fragments are dominantly opaque, locally opalescent; a few are transparent. Luster of cleavage surfaces pearly. Hardness like that of mica, or a little less. Highly perfect {001} cleavage. D_{meas} = 2.43 g/cm³ in heavy liquids. Insoluble in HCl. Does not exfoliate upon heating; basal spacings are unaffected by treatment with ethylene glycol or glycerin. Colorless in thin section, uniaxial or biaxial negative with $2V < 5°$, $\alpha = 1.543(3)$. Single-crystal studies (oscillation method) gave a = 5.31, b = 9.29 Å, c not determinable because of layer disorder. Strongest lines in the pattern of one of five grains studied by X-ray (16 lines given) are 12.3(100), 4.55(50), 2.64(60), 2.459(40), and 1.544(80); those for a second grain (15 lines given) are 14.4(100), 4.58(50), 2.64(50), 2.449(30), and 1.549(80). The mineral, in intimate intergrowths with phlogopite, occurs on the walls of fissures with asbestiform richterite in upper Proterozoic dolomite in the Sirenevyy Kamen (Lilac Stone) charoite deposit, southwestern Aldan Shield, Russia. The mineral apparently formed under hydrothermal conditions, possibly from Si-rich fluids circulating through fissures.

Discussion. The mineral is inferred to be a heterogeneous 2:1 layer silicate, with layers varying from 12–14 Å in thickness. Although the mineral behaves like vermiculite after heating, it differs in not exfoliating and in having a higher Si/Al ratio and less H_2O. A formula calculated from the above-cited average analysis for 22 anionic charges, OH + F = 2, and H_2O by difference corrected for O ≡ F (i.e., 12.63 wt% H_2O) is $(K_{0.02}Na_{0.06}Ca_{0.14}Mg_{0.10})_{\Sigma 0.32}(Mg_{2.98}Ti_{0.02})_{\Sigma 3.00}[(Si_{3.24}Al_{0.45}Fe_{0.37})_{\Sigma 4.06}O_{10}](OH_{1.88}F_{0.12})\cdot 2.13H_2O$. Although the formulae for the unnamed layer silicate and for intergrown phlogopite are more reasonable, with the assumption that the Fe is $^{[4]}Fe^{3+}$, no justification is given for making this assumption. **E.S.G.**

New Data

Nealite

G. Giuseppetti, F. Mazzi, C. Tadini (1993) The crystal structure of nealite: $Pb_4Fe(AsO_3)_2Cl_4\cdot 2H_2O$. Neues Jahrb. Mineral. Mon., 278–288.

Single-crystal X-ray structure study (R = 0.063) of nealite from Laurium, Greece, gave triclinic symmetry, space group $P\bar{1}$, a = 6.53(1), b = 10.23(2), c = 5.588(5) Å, α = 96.4(1), β = 89.5(2), γ = 97.8(2)°. The new formula as given above indicates that the mineral is an arsenite chloride rather than an arsenate chloride. **J.L.J.**

Scawtite

Li-ming Zhang, Ping-qiu Fu, He-xiong Yang, Kai-bei Yu, Zhong-yuan Zhou (1992) Crystal structure of scawtite. Chinese Sci. Bull., 37(11), 930–934.

Single-crystal X-ray structure study (R = 0.0219) of scawtite, $Ca_7(Si_6O_{18})(CO_3)\cdot 2HO$, confirmed the monoclinic cell, newly resolved the space group as Cm, and determined that CO_3 is ordered in the structure. **J.L.J.**