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NEW MINERALS RECENTLY APPROVED BY THE COMMISSION ON NEW MINERALS AND MINERAL NAMES INTERNATIONAL MINERALOGICAL ASSOCIATION

The information given here is provided by the Commission on New Minerals and Mineral Names, International Mineralogical Association (IMA), for comparative purposes and as a service to mineralogists working on new species. Each mineral is described in the following format:

IMA Number
Chemical formula (any relationship to other minerals)
Crystal system, space group
unit-cell parameters
Color; luster; diaphaneity
Optical properties
Strongest lines in the X-ray powder-diffraction pattern [*d* in Å(I)]

The names of these approved species are considered confidential information until the authors have published their descriptions or released information themselves. No other information will be released by the Commission.

Joseph A. Mandarino, Chairman Emeritus and Joel D. Grice, Chairman
Commission on New Minerals and Mineral Names
International Mineralogical Association

1997 PROPOSALS

IMA No. **97-001**
$(Bi,Pb)_2Fe(O,OH)_3PO_4$ Chemically related to **paulkerrite**
Monoclinic: *C2/m*
a 12.278, *b* 3.815, *c* 6.899 Å, β 111.14°
Black to dark brown; vitreous to adamantine; opaque to translucent
Biaxial (–), α 2.06, β 2.15(calc.), γ 2.19, 2*V*(meas.) 70°
5.726(54), 3.372(77), 3.322(37), 3.217(46), 3.011(100), 2.863(34), 2.750(62)

IMA No. **97-002**
$Ca_2B_2SiO_7$ The boron-dominant analogue of **gehlenite** (melilite group)
Tetragonal: $P42_1m$
a 7.116, *c* 4.815 Å
Creamy-white; earthy; earthy
Probably uniaxial (–), *n* 1.67
3.479(40), 2.862(55), 2.654(100), 2.231(15), 2.129(20), 1.920(35), 1.644(20)

IMA No. **97-003**
$NaK_2(Ti,Nb)_2Si_4O_{12}(O,OH)_2 \cdot 2H_2O$ The Ti-dominant analogue of **nenadkevichite**
Monoclinic: *C2/m*
a 14.39, *b* 13.900, *c* 7.825 Å, β 117.6°
Colorless; vitreous; transparent to translucent
Biaxial (+), α 1.667, β 1.677, γ 1.802, 2*V*(meas.) 32°, 2*V*(calc.) 33°
6.94(61), 6.39(43B), 3.186(100), 3.100(96), 2.600(28), 2.586(28), 2.489(24)

IMA No. **97-004**
$AgSbS_2$ A polymorph of **miargyrite**
Cubic: *Fm3m*
a 5.650 Å
Greyish black; metallic; opaque
In reflected light: grey. *R*: 34.5% (470 nm), 33.8% (546 nm), 32.8% (589 nm), 28.7% (650 nm).
3.26(9), 2.83(10), 1.998(8), 1.703(6), 1.630(5), 1.296(2), 1.263(3)

IMA No. **97-005**
$(UO_2)H(AsO_3)$
Tetragonal: space group unknown

a 11.00, *c* 15.96 Å
Yellow; dull; translucent
Uniaxial (–), ω 1.84, ϵ 1.75
5.58(8), 4.95(10), 4.40(6), 3.33(8), 3.03(6), 2.91(5)

IMA No. **97-007**
$Na_3SrCeMnSi_6O_{17}$ The Mn^{2+}-dominant analogue of **nordite-(Ce)**
Orthorhombic: *Pcca*
a 14.449, *b* 5.187, *c* 19.849 Å
Colorless, pale brownish, brown; vitreous; transparent
Biaxial (–), α 1.623, β 1.636, γ 1.642, 2*V*(meas.) 60°, 2*V*(calc.) 68°
7.22(38), 4.215(100), 3.326(67), 2.965(83), 2.875(55), 2.597(54), 2.443(35)

IMA No. **97-008**
$Na_3SrCeFeSi_6O_{17}$ The Fe^{2+}-dominant analogue of **nordite-(Ce)**
Orthorhombic: *Pcca*
a 14.460, *b* 5.187, *c* 19.848 Å
Colorless or light coffee color; vitreous; transparent
Biaxial (–), α 1.623, β 1.636, γ 1.642, 2*V*(meas.) 60°, 2*V*(calc.) 68°
7.22(41), 4.216(100), 3.325(67), 2.964(73), 2.879(62), 2.595(46), 2.444(31)

IMA No. **97-009**
$CaCu_6[(AsO_4)_2(AsO_3OH)(OH)_6]\cdot 3H_2O$
The calcium- and arsenate-dominant member of the **mixite** group
Hexagonal: $P6_3/m$
a 13.571, *c* 5.880 Å
Pale green; vitreous; transparent
Uniaxial (+), ω 1.688, ϵ 1.765
11.64(100), 4.431(41), 3.387(17), 3.254(22), 2.9347(42), 2.6932(29), 2.5624(30)

IMA No. **97-010**
$Pb_4As_2S_7$
Orthorhombic: *Pba*2 or *Pbam*
a 15.179, *b* 38.117, *c* 4.0428 Å
Silvery lead grey; metallic; opaque
In reflected light: white with a greenish tint, distinct anisotropism (dark grey to greenish grey, weak bireflectance, weak pleochroism. $R_{min.}$ & $R_{max.}$: 33.8, 34.0% (470 nm), 31.8, 31.9% (546 nm), 31.2, 31.3% (589 nm), 30.4, 30.4% (650 nm)
4.462(40), 3.699(37), 3.392(100), 2.817(45), 2.735(31), 2.156(25), 2.150(22)

IMA No. **97-012**
$Ca(Al,Fe^{2+},Mg,Mn)_2(AsO_4)_2(OH)_2$
Monoclinic: *C*2
a 8.9252, *b* 6.1427, *c* 7.352 Å, β 115.25°
Light brownish to brownish pink, orange-brown; vitreous; transparent
Biaxial (sign unknown), *n* 1.76 parallel to fiber, *n* 1.70 perpendicular to fiber
4.914(58), 3.376(65), 3.164(100), 3.084(61), 2.945(72), 2.687(53), 2.522(84)

IMA No. **97-013**
$Ca_8Mg(SiO_4)_4Cl_2$
Cubic: $Fd\bar{3}$
a 15.0850 Å
Orange brown to amber; vitreous; transparent
Isotropic, *n* 1.676
2.901(40), 2.666(100), 2.549(30), 1.9637(30), 1.8845(30), 1.7774(30), 1.5400(50), 1.4585(30)

IMA No. **97-014**
$Mg_2Al_3B_2O_9(OH)$ Chemically and structurally related to **sinhalite**
Monoclinic: $P2_1/c$
a 7.49, *b* 4.33, *c* 9.85 Å, ß 110.7°
Colorless; vitreous; transparent
Biaxial (–), α 1.691, β 1.713, γ 1.730, 2*V*(meas.) 80.0°, 2*V*(calc.) 82°
3.21(40), 2.61(40), 2.14(100), 2.102(60), 1.625(100), 1.607(40), 1.399(40)

IMA No. **97-015**
$(Na,Ca)_5Ca(Ti,Nb)_5Si_{12}O_{34}(OH,F)_8\cdot 5H_2O$
A Ca-dominant polymorph of **zorite**
Orthorhombic: *C*222
a 7.024, *b* 23.155, *c* 6.953 Å
Pale brown, brown, orange-yellow; vitreous; transparent to translucent
Biaxial (+), α 1.599, β 1.610, γ 1.696, 2*V*(meas.) 38°, 2*V*(calc.) 41°
11.564(100), 6.932(90), 5.258(40), 4.446(40), 3.052(75), 2.977(70), 2.582(40)

IMA No. **97-017**
Sb_2O_4 ($Sb^{3+}Sb^{5+}O_4$, β-phase) A monoclinic polymorph of **cervantite**
Monoclinic: *C*2/*c*
a 12.061, *b* 4.836, *c* 5.383 Å, β 104.60°
Colorless; vitreous; transparent
Biaxial (sign unknown), α′ 1.72, γ′ 2.10
3.244(VS), 2.920(M), 2.877(S), 1.619(M)

IMA No. **97-018**
$K(Ca,Mn,Na)_2(K_{2-x}\square_x)_2Zn_3Si_{12}O_{30}$ A member of the **milarite** group
Hexagonal: *P*6/*mcc*
a 10.505, *c* 14.185 Å
Colorless, white; vitreous; transparent to translucent
Uniaxial (+), ω 1.561, ϵ 1.562
7.11(35), 3.830(100), 3.345(60), 3.304(40), 2.940(50), 2.795(85), 2.627(35)

IMA No. **97-019**
$Zn_4Al_2(OH)_{12}(CO_3)\cdot 3H_2O$ The zinc-dominant member of the **manasseite** group

Hexagonal: $P6_3/mmc$
a 3.0725, *c* 15.1135 Å
White; vitreous; transparent
Optical properties could not be measured
7.51(vs), 3.794(m), 2.511(mw), 2.175(mw), 1.830(mw), 1.542(ms), 1.539(ms)

IMA No. **97-021**
$HgBi_2S_4$
Monoclinic: *C*2/*m*
a 14.164, *b* 4.053, *c* 13.967 Å, β 118.28°
Grey-black; metallic; opaque
In reflected light: creamy-white, distinct anisotropism, low bireflectance, nonpleochroic. R_1 & R_2: 35.7, 37.8% (470 nm), 35.4, 37.5% (546 nm), 34.9, 37.0% (589 nm), 33.9, 35.8% (650 nm)
3.86(m), 3.55(m), 3.05(S), 2.914(mS), 2.865(mS), 2.644(m), 1.913(m), 1.805(m)

IMA No. **97-022**
$(Cd,Ca,Mn)KCu_5(AsO_4)_4[As(OH)_2O_2](H_2O)_2$
The cadmium-dominant analogue of 97-023
Monoclinic: $P2_1/m$
a 9.8102, *b* 10.0424, *c* 9.9788 Å, β 101.686°
Electric blue; vitreous; transparent
Biaxial (–), α 1.720, β 1.749, γ 1.757, 2*V*(meas.) 50°, 2*V*(calc.) 55°
9.64(100), 4.46(40), 3.145(50), 3.048(40), 2.698(40)

IMA No. **97-023**
$(Ca,Cd,Mn)KCu_5(AsO_4)_4[As(OH)_2O_2](H_2O)_2$
The calcium-dominant analogue of 97-022
Monoclinic: $P2_1/m$
a 9.8102, *b* 10.0424, *c* 9.9788 Å, β 101.686°
Electric blue; vitreous; transparent
Biaxial (–), α 1.713, β 1.743, γ 1.749, 2*V*(meas.) 50°, 2*V*(calc.) 48°
9.64(100), 4.46(40), 3.145(50), 3.048(40), 2.698(40)

IMA No. **97-024**
$Cu_4Cd(SO_4)_2(OH)_6 \cdot 4H_2O$ The cadmium-dominant analogue of **campigliaite**
Monoclinic: $P2_1/m$
a 5.543, *b* 21.995, *c* 6.079 Å, β 92.04°
Bluish green; vitreous; transparent
Biaxial (–), α 1.619, β 1.642, γ 1.661, 2*V*(meas.) 66°, 2*V*(calc.) 83°
11.02(90), 5.496(100), 5.322(25), 4.079(50), 3.437(30), 3.243(40), 2.470(30)

IMA No. **97-025**
$UO_2CO_3 \cdot H_2O$
Hexagonal: space group unknown
a 15.79, *c* 23.93 Å
Canary yellow; silky; translucent
Uniaxial (+), ω 1.588, ϵ 1.612
7.86(47), 6.91(55), 6.56(77), 4.76(40), 4.34(36), 3.39(33), 3.056(100)

IMA No. **97-026**
$Ca_{19}(Al,Mg,Fe,Ti)_{13}(B,Al,\square)_5Si_{18}O_{68}(O,OH,F)_{10}$
The boron-dominant analogue of **vesuvianite**
Tetragonal: *P*4/*nnc*
a 15.752, *c* 11.717 Å
Dark green; vitreous; translucent
Uniaxial (+), ω 1.721, ϵ 1.725
2.776(100), 2.617(61), 2.592(43), 2.491(61), 2.121(20), 1.660(26), 1.640(23)

IMA No. **97-027**
$Ca(Co,Fe,Ni)_2(AsO_4)_2(OH,H_2O)_2$
The cobalt-dominant analogue of **lotharmeyerite**
Monoclinic: *C*2/*m*
a 9.024, *b* 6.230, *c* 7.421 Å, β 115.15°
Brown; vitreous; translucent
Biaxial (+), α 1.78, β 1.79, γ 1.85(calc.), 2*V*(meas.) 48°
4.955(38), 3.398(85), 3.188(28), 3.115(33), 2.972(100), 2.709(28), 2.545(34)

IMA No. **97-029**
$Rh_{17}S_{15}$ The rhodium- and sulfur-dominant analogue of **palladseite**
Cubic: $Pm\bar{3}m$, $P\bar{4}3m$ or *P*432
a 10.024 Å
Color unknown; metallic; opaque
In reflected light: grey with slight bluish tint, isotropic. R: 38.6% (480 nm), 39.0% (540 nm), 39.1% (580 nm), 38.8% (660 nm)
3.33(2), 3.17(7), 3.02(9), 2.68(5), 2.24(9), 1.931(8), 1.774(10)

IMA No. **97-030**
$Rh_{12}As_7$
Hexagonal: $P6_3/m$
a 9.31, *c* 3.64 Å
Color unknown; metallic; opaque
In reflected light: brownish grey, weak anisotropism from grey to brownish grey, weak bireflectance, nonpleochroic. $R_{min.}$ & $R_{max.}$: 44.5, 47.8% (480 nm), 44.7, 48.3% (540 nm), 46.4, 49.2% (580 nm), 48.6, 51.3% (660 nm)
2.33(4), 2.03(2), 1.852(9), 1.767(6), 1.755(10), 1.549(8)

IMA No. **97-032**
$(Ca,Cu)_4Fe_6[(As,Si)O_4]_4(OH)_8 \cdot 18H_2O$
The Fe^{2+}-dominant analogue of **wallkilldellite**
Hexagonal: $P6_3/mmc$, $P6_3mc$ or *P*62*c*
a 6.548, *c* 23.21 Å
Brown-yellow; vitreous to resinous; translucent
Uniaxial (–), ω 1.750, ϵ could not be determined
11.6(100), 5.670(80), 3.275(70), 2.850(10), 2.760(15), 2.547(10), 1.641(25)

IMA No. **97-034**
$ZnFe^{3+}_2(AsO_4)_2(OH)_2$
Monoclinic: $P2_1/n$
a 6.629, *b* 7.616, *c* 7.379 Å, β 91.79°
Dark green; adamantine; translucent
Biaxial (sign unknown), *n* 1.94; the mineral reacts with liquids of $n > 1.9$
3.385(100), 3.315(78), 2.939(47), 2.839(28), 2.381(29), 2.331(29), 1.652(32), 1.621(34)

IMA No. **97-035**
$(K,Na)Ca_2Fe^{2+}Fe^{3+}_2[Si_5Al_3O_{22}](OH)_2$ A member of the amphibole group
Monoclinic: *C*2/*m*
a 9.94, *b* 18.08, *c* 5.38 Å, ß 105.5°
Black; vitreous; transparent
Biaxial (–), α 1.696, β not determined, γ 1.715, 2*V*(meas.) 45°
8.44(90), 3.405(25), 3.285(30), 3.145(100), 2.823(26), 2.722(52), 2.606(27), 2.579(25)

IMA No. **97-036**
$Ca(Ce,REE)_2(CO_3)_4 \bullet H_2O$
Triclinic: $P\bar{1}$
a 6.397, *b* 6.389, *c* 12.383 Å, α 96.58°, β 100.85°, γ100.46°
Colorless to white; vitreous; translucent
Biaxial (–), α 1.635, β 1.725, υ 1.750, 2V(calc.) 53°
5.901(59), 5.049(72), 4.695(37), 4.468(36), 4.006(110), 3.899(45), 3.125(39), 3.0051(448)

IMA No. **97-037**
$Na_2CaCu^{2+}_2(P_2O_7)_2(H_2O)_{10}$
Orthorhombic: *Fdd*2
a 11.938, *b* 32.854, *c* 11.017 Å
Blue-green; vitreous; transparent
Biaxial (+), α 1.508, β 1.511, γ 1.517, 2*V*(meas.) 76.2°, 2*V*(calc.) 71°
8.23(30), 6.52(100), 4.05(40), 3.255(40), 2.924(40), 2.807(25), 2.614(20)

IMA No. **97-041**
$Na_2Zn(SO_4)_2 \bullet 4H_2O$ The zinc-dominant analogue of **blödite**
Monoclinic: $P2_1/a$
a 11.077, *b* 8.249, *c* 5.532 Å, β 100.18°
Colorless; vitreous; transparent
Biaxial (–), α 1.507, β 1.512, γ 1.516 (all for synthetic material)
4.550(58), 4.245(32), 3.325(25), 3.289(100), 3.262(35), 3.245(25), 2.631(27)

IMA No. **97-042**
$Pb_9Sb_{10}S_{24}$
Triclinic: $P\bar{1}$
a 24.789, *b* 8.26, *c* 21.787 Å, α 90.53°, β 99.58°, γ 94.78°
Black; metallic; opaque
In reflected light: black, low anisotropism, low bireflectance, nonpleochroic. R_1 & R_2: 38.95, 37.64% (470 nm), 42.35, 38.26% (546 nm), 41.67, 37.63% (589 nm), 37.43, 36.53% (650 nm)
3.47(vs), 3.35(ms), 3.24(ms), 2.986(s), 2.947(s), 2.229(ms)

IMA No. **97-043**
$PbSnS_3$
Orthorhombic: *Pnma*
a 8.8213, *b* 3.7725, *c* 14.0053 Å
Greyish black; metallic; opaque
In reflected light: white, weak anisotropism, weak bireflectance, nonpleochroic. R_1 & R_2: 33.9, 36.0% (470 nm), 31.3, 32.9% (546 nm), 30.0, 31.4% (589 nm), 28.8, 29.9% (650 nm)
4.128(100), 3.730(30), 3.1085(28), 2.8081(51), 2.7421(41), 2.6692(51), 1.9335(54)

IMA No. **97-044**
$(Mg,Fe)SiO_3$ A member of the **ilmenite** group
Hexagonal (trigonal): $R\bar{3}$
a 4.78, *c* 13.6 Å
Colorless; vitreous; transparent
Uniaxial, no other data could be determined
3.509(61), 2.616(100), 2.366(52), 2.097(45), 1.755(45), 1.636(65), 1.366(50)

IMA No. **97-045**
Na_2LiAlF_6
Monoclinic: $P2_1$ or $P2_1/m$
a 7.5006, *b* 7.474, *c* 7.503 Å, β 90.847°
Pale buff-cream; somewhat greasy; transparent to translucent
Almost isotropic (birefringence = 0.0009), biaxial, *n* 1.359, 2*V*(meas.) up to 27°
4.33(100), 2.65(60), 2.25(70), 2.18(50), 2.158(40), 1.877(90)

IMA No. **97-047**
$(Na,Y)(Y,REE)(HCO_3)(OH)_2 \bullet 5H_2O$
Monoclinic: *P*2 (pseudo-tetragonal)
a 4.566, *b* 13.018, *c* 4.566 Å, ß 90.15°
White to yellow; vitreous; translucent to transparent
Uniaxial (–), ω 1.540, ϵ 1.40, 2*V*(meas.) 0–5°
12.97(10), 6.52(3), 4.57(3), 4.32(5), 3.223(3), 3.133(5), 2.016(4)

IMA No. **97-048**
$NaCa_2Mg_2(VO_4)_3$ The magnesium-dominant analogue of **palenzonaite**
Cubic: $Ia\bar{3}d$
a 12.427 Å
Red; adamantine; transparent
Isotropic, *n* 1.94
3.108(44), 2.779(100), 2.652(20), 2.535(39), 1.723(26), 1.662(40)

IMA No. **97-049**
$KFe^{3+}_3(H_2PO_4)_6(HPO_4)_2 \bullet 4H_2O$

Monoclinic: *C*2/*c*
a 16.95, *b* 9.59, *c* 17.57 Å, β 90.85°
White; vitreous; translucent
Biaxial (–), α 1.557, β 1.598, γ 1.602, 2*V*(meas.) 32°, 2*V*(calc.) 34°
8.83(10), 7.60(4), 3.75(10), 3.30(4), 3.23(5), 3.11(4), 3.02(9)

IMA No. **97-050**
$BaMn_9[(V,As)O_4]_6(OH)_2$
Cubic: $Pa\bar{3}$
a 12.845 Å
Dark red; adamantine; transparent
Isotropic, $n > 2.0$
3.01(87), 2.790(100), 2.608(100), 2.332(44), 2.134(53), 1.510(99), 1.0020(35)

IMA No. **97-051**
$TlAg_2(As,Sb)_3S_6$
Orthorhombic: *Pnmb* or $P2_1nb$
a 12.479, *b* 15.522, *c* 5.719 Å
Dark grey; metallic; opaque
In reflected light: pure white, extremely weak anisotropism, no bireflectance, nonpleochroic. $R_{min.}$ & $R_{max.}$: 31.43, 33.43% (470 nm), 28.31, 30.52% (546 nm), 27.10, 29.11% (589 nm), 25.57, 27.44% (650 nm)
3.655(16), 3.363(50), 3.290(23), 3.210(26), 3.118(27), 2.822(100), 2.540(17), 2.070(15)

PROPOSALS FROM PREVIOUS YEARS APPROVED IN 1997

IMA No. **93-029**
$Na_4SrCeTiSi_8O_{22}F{\bullet}5H_2O$
Monoclinic: *P*2/*a* (?)
a 23.88, *b* 14.40, *c* 7.238 Å, β 91.0°
Yellow, pink-yellow or cream; vitreous and silky; translucent
Biaxial (–), α 1.542, β 1.569, γ 1.571, 2*V*(meas.) 28°, 2*V*(calc.) 30°
12.36(100), 3.232(13), 3.190(29), 3.108(29), 3.087(21), 3.058(13), 2.708(12)

IMA No. **96-016**
$Mg_4Cl(OH)_7{\bullet}6H_2O$
Orthorhombic: *Pcmm*, $Pcm2_1$, or *Pc*2*m*
a 11.215, *b* 3.124, *c* 19.21 Å
Yellowish white; vitreous or pearly; translucent
Biaxial (–), α 1.532, β ~ γ 1.562, 2*V*(meas.) ≤ 5°
11.41(29), 9.78(46), 9.60(38), 4.25(20), 3.498(100)

IMA No. **96-018**
$\square(LiAl_2)Al_6(BO_3)_3(Si_6O_{18})(OH)_4$ A member of the tourmaline group
Hexagonal (trigonal): *R*3*m*
a 15.770, *c* 7.085 Å
Pink; vitreous; translucent
Uniaxial (–), ω 1.645, ε 1.624
4.181(58), 3.950(100), 3.434(52), 2.924(56), 2.552(93), 1.898(72)

IMA No. **96-061**
$Fe^{3+}AsO_4{\bullet}2H_2O$ Hexagonal or trigonal dimorph of **scorodite**
Hexagonal: *P*-*c*- (extinction symbol)
a 8.9327, *c* 9.9391 Å
White to light yellow-brown; vitreous; translucent
Uniaxial (sign unknown), ω and ε > 1.72
4.973(61), 4.184(44), 4.076(100), 3.053(67), 2.806(68), 2.661(59), 2.520(54), 2.2891(44)