New minerals recently apporved by the Commission on New Minerals and Mineral Names International Mineralogical Association

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The information given here is provided by the Commission on New Minerals and Mineral Names, I.M.A. for comparative purposes and as a service to mineralogists working on new species.

Each mineral is described in the following format:

IMA No.
(any relationship to other minerals)
Chemical Formula
Crystal system, space group
unit cell parameters
Colour; lustre; diaphaneity
Optical properties
Strongest lines in the X-ray powder diffraction pattern

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.

J. A. Mandarino, Chairman
Commission on New Minerals and Mineral Names
International Mineralogical Association

1992 Proposals

IMA No. 92-001
$FeZr(PO_4)_2 \cdot 4\ H_2O$
Monoclinic: P21/c
a 9.12, b 5.42, c 19.17 Å, β 94.8°
Pale yellowish white; vitreous to dull; transparent.
Biaxial (+), α 1.644, β 1.652, γ 1.652, 2V(meas.) 0°, 2V(calc.) 0°.
9.58 (75), 4.572 (65), 4.382 (80), 4.092 (60), 3.160 (100), 2.640 (70).

IMA No. 92-002
$Bi_2O(OH)_2SO_4$
Monoclinic: $P2_1/c$
a 7.700, b 13.839, c 5.686 Å, β 109.11°
Colourless; adamantine; transparent.
Biaxial, indices of refraction calculated from reflectance data at 589 nm: R_1 1.91, R_2 1.99.
3.644 (60), 3.466 (60), 3.206 (100), 2.924 (70), 2.782 (50), 1.984 (90).

IMA No. 92-003
The selenium analogue of stibnite.
Sb_2Se_3
Orthorhombic: Pbnm
a 11.593, b 11.747, c 3.984 Å
Black; metallic; opaque.
In reflected light: white, distinct anisotropism, distinct bireflectance, pleochroic white to greyish white. $R_{max.}$ & $R_{min.}$: (42.62, 40.55%) 470 nm, (41.95, 39.02%) 546 nm, (41.23, 39.42%) 589 nm, (44.39, 41.56%) 650 nm.

3.70 (70), 3.17 (50), 2.870 (100), 2.625 (60), 1.930 (30), 1.764 (35).

IMA No. 92-005
$Mg[UO_2(AsO_3)_x(AsO_4)_{1-x}]_2 \cdot 7\ H_2O$, x about $^2/_3$
Monoclinic: C2/m
a 18.194, b 7.071, c 6.670 Å, β 99.70°
Bright yellow to straw yellow; vitreous; transparent.
Biaxial (–), α 1.610, β 1.730, γ 1.740, 2V(meas.) 34°, 2V(calc.) 30°.
9.02 (100), 4.90 (40), 4.48 (80), 4.00 (40), 3.53 (40), 3.28 (50), 3.01 (60), 2.849 (60).

IMA No. 92-006
The nickel-analogue of hydromagnesite.
$Ni_5(CO_3)_4(OH)_2 \cdot 4–5\ H_2O$
Monoclinic: $P2_1/c$
a 10.06, b 8.75, c 8.32 Å, β 114.3°
Bluish-green; silky; transparent.
Biaxial (sign unknown), α' 1.630, γ' 1.640, 2V unknown.
6.30 (5), 5.75 (10), 4.36 (4), 4.14 (3), 2.871 (4b), 2.458 (2b), 2.120 (3).

IMA No. 92-008
$NaH(CO_3)H_3(BO_3) \cdot 2\ H_2O$
Monoclinic: C2
a 16.119, b 6.928, c 6.730 Å, β 100.46°
Colourless; vitreous; transparent.
Biaxial (–), α 1.351 (calc.), β 1.459, γ 1.486, 2V(meas.) 50°.
6.36 (25), 4.203 (6), 3.464 (100), 3.173 (59), 2.608 (5), 1.731 (19).

IMA No. 92-010
A triclinic polymorph of 92-011.
$Ca_9B_{26}O_{34}(OH)_{24}Cl_4 \cdot 13\ H_2O$
Triclinic: P1
a 12.759, b 13.060, c 9.733 Å, α 102.14°, β 102.03°, γ 85.68°
Colourless to very pale yellow; vitreous; translucent to transparent.
Biaxial (+), α 1.537, β 1.548, γ 1.570, 2V(meas.) 77°, 2V(calc.) 71°.
9.21 (70), 7.69 (100), 5.74 (60), 4.63 (40), 3.845 (35), 2.199 (30b).

IMA No. 92-011
A monoclinic polymorph of 92-010.
$Ca_9B_{26}O_{34}(OH)_{24}Cl_4 \cdot 13\ H_2O$
Monoclinic: $P2_1$
a 19.88, b 9.715, c 17.551 Å, β 114.85°
Colourless to very pale yellow; vitreous; translucent to transparent.
Biaxial (+), α 1.542, β 1.545, γ 1.565, 2V(meas.) 47°, 2V(calc.) 43°.
9.03 (60), 8.56 (100), 6.62 (70), 6.14 (30b), 5.12 (30), 4.09 (30), 3.768 (30), 3.493 (30).

IMA No. 92-012
$Ca_2(CaMn)(SiO_3OH)_2(OH)_2$
Orthorhombic: Pbca
a 9.398, b 9.139, c 10.535 Å
Colourless; vitreous; transparent.
Biaxial (+), α 1.634, β 1.640, γ 1.656, 2V(meas.) 65°, 2V(calc.) 63°.
4.18 (45), 3.231 (100), 2.846 (42), 2.789 (35), 2.391 (42), 2.042 (28).

IMA No. 92-013
The phosphate analogue of preisingerite and schumacherite.
$Bi_3O(OH)(PO_4)_2$
Triclinic: $P\bar{1}$
a 9.798, b 7.250, c 6.866 Å, α 88.28°, β 115.27°, γ 110.70°
White to pale pink, sometimes brown; vitreous; transparent to translucent.
Mean index of refraction estimated from reflectance data: 2.01 at 589 nm.
4.437 (46), 3.247 (87), 3.188 (100), 3.135 (95), 3.026 (75), 2.953 (47), 2.165 (41).

IMA No. 92-014
$Na_xCa_yCu_z(Mg,Fe^{3+},Al)_3(AsO_4)_3$, x ~ 0.76, y ~ 0.42, z ~ 0.39
Monoclinic: C2/c
a 11.882, b 12.760, c 6.647 Å, β 112.81°
Light blue; vitreous; translucent.
Biaxial (+), α 1.714, β 1.744, γ 1.783, 2V(meas.) 60°, 2V(calc.) 84°.
4.35 (40), 4.06 (50), 3.56 (40), 3.53 (40), 3.495 (60), 3.066 (40), 2.744 (140), 2.605 (40).

IMA No. 92-015
The ferric analogue of millosevichite.
$(Fe,Al)_2(SO_4)_3$
Hexagonal: $R\bar{3}$
a 8.14, c 21.99 Å
White to light brown; dull; transparent.
Uniaxial (sign unknown), n is between 1.555 and 1.625.
5.99 (28), 4.35 (23), 3.56 (100), 2.97 (20), 2.72 (20), 2.64 (11).

IMA No. 92-016
The phosphate analogue of arsenoclasite.
$Mn_5(PO_4)_2(OH)_4$
Orthorhombic: $P2_12_12_1$
a 9.097, b 5.693, c 18.00 Å
Pale yellow, yellow, pale burnt orange; adamantine; transparent.

Biaxial (sign unknown), α' 1.74, γ' 1.76, 2V unknown.
2.900 (100), 2.853 (70), 2.802 (50), 2.702 (80), 2.022 (15), 1.608 (15).

IMA No. 92-017
A member of the garnet group.
$Ca_3(Ti,Fe^{2+}Fe^{3+})_2(Si,Fe^{3+})_3O_{12}$
Cubic: Ia3d
a 12.162 Å
Black; adamantine; opaque.
Isotropic, ω 1.955.
3.039 (72), 2.720 (100), 2.483 (51), 2.385 (21), 1.973 (24), 1.687 (26), 1.626 (56).

IMA No. 92-018
$Ca_2Y(AsO_4)(WO_4)_2$
Tetragonal: $I4_1/a$
a 5.135, c 33.882 Å
Creamy yellow; vitreous to adamantine; translucent.
Uniaxial (+), ω 1.874, ε 1.918.
4.674 (18), 3.059 (100), 2.571 (19), 1.901 (32), 1.818 (16), 1.674 (17), 1.562 (32).

IMA No. 92-019
$C_{14}H_{10}$
Monoclinic: $P2_1$
a 8.392, b 6.181, c 9.558 Å, β 98.48°
Colourless to greyish-white; vitreous to waxy; transparent.
Biaxial (+), $n_{min.}$ ~1.75, $n_{max.}$ ~ 1.95, 2V(meas.) ~ 90°.
9.434 (100), 4.941 (11), 4.724 (11), 4.546 (5), 4.028 (13), 3.371 (10).

IMA No. 92-020
A member of the amphibole group.
$(Na,K)(Ca,Na)_2(Mg,Fe^{3+},Fe^{2+})_5Si_8O_{22}(F,OH,O)_2$
Monoclinic: C2/m
a 9.762, b 17.888, c 5.122 Å, β 102.25°
Blue green and green; vitreous; transparent.
Biaxial (–), α 1.618, β 1.624, γ 1.627, 2V(meas.) 71°, 2V(calc.) 70°.
9.9 (70), 3.69 (60), 3.34 (100), 3.18 (60), 3.13 (90), 2.82 (70), 1.98 (90), 1.439 (60).

IMA No. 92-024
$CuBi_2O_4$
Tetragonal: P4/ncc
a 8.511, c 5.823 Å
Black; metallic; opaque.
In reflected light: grey, weak anisotropism, weak but distinct bireflectance, pleochroic grey with a faint bluish tint and brownish grey. $R_{max.}$ & $R_{min.}$: (21.1, 19.0%) 482 nm, (20.2, 18.0%) 545 nm, (19.7, 17.6%) 589 nm, (19.5, 17.3%) 659 nm.
4.26 (17), 3.191 (100), 2.913 (16), 2.695 (18), 1.947 (18).

IMA No. 92-025
$Cu_3TeO_6 \cdot H_2O$
Cubic: P-lattice, space group unknown
a 9.555 Å
Emerald green; adamantine; transparent to translucent.
Isotropic, ω 2.01 calculated from reflectance values at 589 nm.
4.26 (40), 2.763 (100), 2.384 (70), 1.873 (40), 1.689 (80), 1.440 (60).

IMA No. 92-026
The *-2H* polytype of 92-027.
$Mn_4Al_2(OH)_{12}CO_3 \cdot 3\ H_2O$
Hexagonal: $P6_322$
a 10.985, c 15.10 Å
Orange-brown, pale brown, pale blue, colourless; vitreous; transparent.
Uniaxial (–), ω 1.587, ε 1.547.
7.53 (100), 3.768 (60), 2.578 (50), 2.221 (40), 1.856 (40), 1.552 (40).

IMA No. 92-027
The *-3T* polytype of 92-026.
$Mn_4Al_2(OH)_{12}CO_3 \cdot 3\ H_2O$
Hexagonal (trigonal): $P3_112$ or $P3_212$
a 10.985, c 22.63 Å
Orange-brown, pale brown; vitreous; transparent.
Uniaxial (–), ω 1.587, ε could not be measured.
7.55 (100), 3.770 (90), 2.670 (70), 2.346 (70), 1.973 (60), 1.586 (30), 1.662 (30).

IMA No. 92-028
The *-2H* polytype of 92-029.
$Mg_4Al_2(OH)_{12}CO_3 \cdot 3\ H_2O$
Hexagonal: $P6_322$
a 10.571, c 15.139 Å
Orange-brown, pale brown; vitreous; transparent.
Uniaxial (+), ω 1.533, ε 1.533.
7.63 (100), 3.785 (100), 2.603 (15), 2.496 (15), 2.341 (15), 2.166 (15), 1.991 (15), 1.825 (20), 1.495 (15).

IMA No. 92-029
The *-3T* polytype of 92-028.
$Mg_4Al_2(OH)_{12}CO_3 \cdot 3\ H_2O$
Hexagonal (trigonal): $P3_112$ or $P3_212$
a 10.558, c 22.71 Å
Yellow to pale yellow; vitreous; transparent.
Uniaxial (+ or –), ω 1.533, ε 1.533.
7.57 (100), 3.778 (90), 2.570 (40), 2.281 (40), 1.932 (40), 1.524 (20), 1.493 (20).

IMA No. 92-030
$Fe_4Al_2(OH)_{12}CO_3 \cdot 3\ H_2O$
Hexagonal (trigonal): $P3_112$ or $P3_212$
a 10.805, c 22.48 Å
Green-brown with black coating; vitreous; transparent.
Uniaxial (–), ω 1.599, ε 1.570.
7.49 (100), 3.746 (50), 2.625 (40), 2.314 (50), 1.948 (40), 1.558 (15), 1.526 (20).

IMA No. 92-031
$Na_5YZrSi_6O_{18} \cdot 6\ H_2O$
Hexagonal (trigonal): R32
a 10.825, c 15.809 Å
Light green to yellow green; vitreous; transparent to translucent.
Uniaxial (–), ω 1.585, ε 1.578.
6.03 (32), 5.40 (63), 3.236 (84), 3.127 (88), 3.030 (100), 1.805 (21).

IMA No. 92-032
A member of the amphibole group.
$(K,Na)(Na,Li)_2(Mg,Mn^{3+},Fe^{3+}Li)_5Si_8O_{22}(OH)_2$
Monoclinic: $P2_1/m$
a 9.94, b 17.80, c 5.302 Å, β 105.5°
Dark red to brownish lilac; vitreous; transparent.
Biaxial (–), α 1.654, β 1.675 (calculated), γ 1.696, 2V(meas.) 88–92°.
8.890 (M), 8.427 (M), 5.077 (M), 4.442 (M), 3.357 (M), 3.257 (S), 3.132 (S), 2.812 (S), 2.553 (S) plus seven other lines of intensity (M).

IMA No. 92-033
$SrMn_2^{3+}[Si_2O_7](OH)_2 \cdot H_2O$
Orthorhombic: Cmcm
a 6.245, b 9.031, c 13.404 Å
Orange-brown; vitreous; translucent.
Biaxial (+), n's > 1.82, 2V(meas.) 63°.
4.804 (86), 3.373 (66), 2.833 (100), 2.807 (82), 2.695 (98), 2.401 (68).

IMA No. 92-034
A member of the tourmaline group.
$\square\ (Fe_2^{2+}Al)Al_6Si_6O_{18}(BO_3)_3(OH)_4$
Hexagonal (trigonal): R3m
a 15.967, c 7.126 Å
Bluish black; vitreous; transparent.
Uniaxial (–), ω 1.664, ε 1.642.
6.338 (84), 4.212 (48), 3.989 (38), 3.452 (91), 2.944 (71), 2.573 (100).

IMA No. 92-035
The magnesium-analogue of staurolite.
$(Mg,Li,Fe,\square)_4Al_{18}Si_8O_{44}(OH)_4$
Monoclinic: C2/m
a 7.872, b 16.55, c 5.634 Å, β 90.00°
Colourless in thin section; vitreous to resinous; transparent.
Biaxial (sign unknown), mean n 1.709, 2V unknown.
4.139 (24), 2.678 (38), 2.390 (50), 2.370 (33), 2.356 (24), 1.968 (100).

IMA No. 92-036
The zinc-analogue of staurolite.
$(Zn,Li,Fe,Mg,\square)_4Al_{18}Si_8O_{44}(OH)_4$
Monoclinic: C2/m
a 7.853, b 16.54, c 5.639 Å, β 90.00°
Colourless in thin section; vitreous to resinous; transparent.
Biaxial (sign unknown), α ~ 1.722, β unknown, γ 1.734, 2V unknown.
3.001 (61), 2.678 (70), 2.390 (87), 2.363 (46), 2.349 (45), 1.968 (61), 1.964 (48), 1.391 (100).

IMA No. 92-037
The tetragonal, lead-analogue of lavendulan.
$NaPbCu_5(AsO_4)_4Cl \cdot 5\ H_2O$
Tetragonal: $P4_122$ or $P4_322$
a 10.066, c 39.39 Å
Intense blue; vitreous; translucent.
Uniaxial (–), ω 1.770, ε 1.710.
9.83 (100), 4.925 (60), 4.482 (50), 3.132 (90), 2.772 (40), 2.515 (50), 1.778 (40).

IMA No. 92-038
$Cu_2O(Fe,Cu,Zn)_6Mo_2Ge_6S_{32}$
Cubic: space group unknown
a 10.64 Å
Megascopic colour unknown; metallic; opaque.
In reflected light: pale yellow to greyish yellow, no anisotropism, no bireflectance, nonpleochroic. R: (23.7%) 470 nm, (25.5%) 546 nm, (25.7%) 589 nm, (25.6%) 650 nm.
3.07 (10), 2.66 (2), 1.884 (8), 1.603 (4), 1.536 ($^1/_2$), 1.331 (1), 1.220 (2), 1.190 (1).

IMA No. 92-039
$Cu_{20}(Fe,Zn,Cu)_6W_2Ge_6S_{32}$
Cubic: space group unknown
a 10.675 Å
Megascopic colour unknown; metallic; opaque.
In reflected light: pale yellowish pink, no anisotropism, no bireflectance, nonpleochroic. R: (23.2%) 470 nm, (23.7%) 546 nm, (24.0%) 589 nm, (23.8%) 650 nm.
4.36 (1), 3.38 (1), 3.08 (10), 2.67 (2), 1.887 (7), 1.612 (5), 1.543 (1), 1.333 (1), 1.225 ($1^1/_2$), 1.192 ($^1/_2$).

IMA No. 92-040
$Na_4Zn_2Si_7O_{18} \cdot 5\ H_2O$
Orthorhombic: F2dd
a 10.211, b 39.88, c 10.304 Å
Colourless to light mauve; vitreous; transparent.
Biaxial (+), α 1.520, β 1.521, γ 1.524, 2V(meas.) 61°, 2V(calc.) 60°.
6.346 (10), 4.959 (3), 3.240 (6), 3.167 (4), 3.140 (4), 2.821 (3).

IMA No. 92-041
The thallium-analogue of jarosite.
$(Tl,K)Fe_3(SO_4)_2(OH)_6$
Hexagonal (trigonal): R3m
a 7.3301, c 17.6631 Å
Gold yellow; adamantine; transparent.
Uniaxial (–), ω 1.822, ε 1.768.
5.974 (87), 3.666 (34), 3.112 (100), 2.9877 (22), 2.5773 (21), 1.9912 (29), 1.8329 (23).

IMA No. 92-043
$Ca(UO_2)_4(SO_4)_2(OH)_6 \cdot 6\ H_2O$
Orthorhombic: P-lattice, space group unknown
a 8.73, b 17.09, c 15.72 Å
Sulphur yellow; vitreous; translucent.
Biaxial (–), α 1.617 (calculated), β 1.710, γ 1.758, 2V(meas.) 68°.
7.90 (100), 4.17 (30), 3.98 (40), 3.49 (80), 3.38 (70), 2.844 (30b).

IMA No. 92-045
The phosphate-analogue of segnitite.
$PbFe_3^{3+}(PO_4)_2(OH,H_2O)_6$
Hexagonal (trigonal): R3m
a 7.325, c 16.900 Å
Cream to brownish yellow to yellowish green; adamantine; translucent.
Uniaxial (–), ω 1.955, ε 1.935.
5.96 (90), 3.67 (60), 3.07 (100), 2.538 (50), 2.257 (50), 1.979 (50).

IMA No. 92-046
$AlF_3 \cdot 3\ H_2O$
Tetragonal: P4/n
a 7.715, c 3.648 Å
Colourless; vitreous; transparent.
Uniaxial (–), ω 1.427, ε 1.403.
5.47 (100), 2.439 (72), 2.027 (70), 1.775 (78), 1.725 (85), 1.306 (70).

IMA No. 92-048
$Na_4REE_2(CO_3)_5$ with Ce the dominant REE
Monoclinic: $P2_1$
a 20.84, b 6.374, c 10.578 Å, β 120.45
Grey with slight pinkish tint; vitreous; translucent.
Biaxial (+ or –), α 1.623, β 1.636, γ 1.649, 2V(meas.) 90°, 2V(calc.) 89°.
9.13 (3), 5.22 (5), 4.13 (3), 3.70 (4), 2.607 (10), 2.148 (3), 1.921 (3).

IMA No. 92-050
The magnesium-analogue of dumortierite.
$(Mg,Ti,\square)(Al,Mg)_2Al_4Si_3O_{18-x}(OH)_xB$ $x \approx 3$
Orthorhombic: Pmcn
a 12.02, b 20.22, c 4.732 Å
Pink to red; vitreous; transparent.
Biaxial (–), α 1.678, β 1.700, γ 1.701, 2V(meas.) 38°, 2V(calc.) 24°.
6.01 (59), 5.88 (100), 3.489 (60), 3.255 (82), 3.074 (53), 2.927 (74), 2.131 (50), 2.090 (48).

NOTE:

The following three minerals from previous years also have been approved.

IMA No. 90-006
$Fe_{16}O_{16}(OH)_y(SO_4)_z$
where $16 - y = 2z$ and $2.0 \leq z \leq 3.5$
Tetragonal: probably P4/m
a 10.66, c 6.04 Å
Brownish yellow; dull; translucent.
Optical properties unknown.
4.86 (37), 3.38 (46), 2.55 (100), 2.28 (23), 1.66 (21), 1.51 (24), 1.46 (18).

IMA No. 90-046
The uranium-analogue of polycrase-(Y).
$(U,Y)(Ti,Nb,Ta)_2O_8$
Orthorhombic: Pbcn
a 14.48, b 5.559, c 5.223 Å
Brown-red; adamantine; opaque.
In reflected light: pale grey with bluish tones; no anisotropism, bireflectance, or pleochroism. R: (23.6%) 470 nm, (21.5%) 546 nm, (22.3%) 589 nm, (25.1%) 650 nm.
3.73 (W), 3.21 (W), 2.99 (S), 2.78 (W), 1.90 (MS), 1.86 (W), 1.77 (MW), 1.48 (M).

IMA No. 91-036
$Fe_2(OH)_3Cl$
Orthorhombic: Pnam
a 6.31, b 9.20, c 7.10 Å
Megascopic colour unknown; lustre probably dull; transparent.
Index of refraction: 1.6 to 1.7.
Electron diffraction pattern: 5.68, 5.07, 2.93, 2.37, 2.14, 1.65.