

**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, 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.

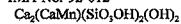
NO OTHER INFORMATION WILL BE RELEASED BY THE COMMISSION.

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

1992 PROPOSALS

- IMA No. 92-001
 $\text{FeZr}(\text{PO}_4)_2 \cdot 4\text{H}_2\text{O}$
Monoclinic: P2/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
 $\text{Bi}_2\text{O}(\text{OH})_2\text{SO}_4$
Monoclinic: P2/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 589nm: 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 %)/470nm, (41.95, 39.02 %)/546nm, (41.23, 39.42 %)/589nm, (44.39, 41.56 %)/650nm.
3.70 (70), 3.17 (50), 2.870 (100), 2.625 (60), 1.930 (30), 1.764 (35).
- IMA No. 92-005
 $\text{Mg}[\text{UO}_2(\text{AsO}_4)_2(\text{AsO}_4)_{1-x}\text{H}_2\text{O}]_x$ x about %
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.
 $\text{Ni}_2(\text{CO}_3)_2(\text{OH})_2 \cdot 4\text{H}_2\text{O}$
Monoclinic: P2/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
 $\text{NaH}(\text{CO}_3)\text{H}_3(\text{BO}_3) \cdot 2\text{H}_2\text{O}$
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.
 $\text{Ca}_2\text{B}_2\text{O}_7(\text{OH})_{2x}\text{Cl}_x \cdot 13\text{H}_2\text{O}$
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.
 $\text{Ca}_2\text{B}_2\text{O}_7(\text{OH})_{2x}\text{Cl}_x \cdot 13\text{H}_2\text{O}$
Monoclinic: P2
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



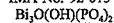
Orthorhombic: Pbc

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 (87), 3.188 (100), 3.135 (95), 2.789 (35), 2.391 (42), 2.042 (28).

IMA No. 92-013 The phosphate analogue of preisingerite and schumacherite.



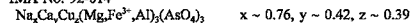
Triclinic: P1

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 589nm.
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



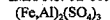
Monoclinic: C2/c

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), 3.053 (40), 3.495 (60), 3.066 (40), 2.744 (140), 2.605 (40).

IMA No. 92-015 The ferric analogue of millosevichite.



Hexagonal: R3

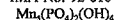
a 8.14 c 21.99 Å

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.

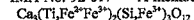
Orthorhombic: P2₁2₁2₁

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.



Cubic: Iad3

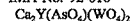
a 12.162 Å

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



Tetragonal: I4/a

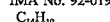
a 5.135 c 33.882 Å

Creamy yellow; vitreous to adamantine; translucent.

Uniaxial (+), α 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

Monoclinic: P2₁

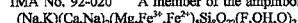
a 8.392 b 6.181 c 9.558 Å β 98.48°

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.



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



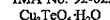
Tetragonal: P4/ncc

a 8.511 c 5.823 Å

Black; metallic; opaque.

In reflected light: grey, weak anisotropism, weak but distinct birefractance, pleochroic grey with a faint bluish tint and brownish grey. R_{max} & R_{min}: (21.1, 19.0 %)482nm, (20.2, 18.0 %)545nm, (19.7, 17.6 %)589nm, (19.5, 17.3 %)659nm.
4.26 (17), 3.191 (100), 2.913 (16), 2.695 (18), 1.947 (18).

IMA No. 92-025



Cubic: P-lattice, space group unknown

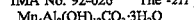
a 9.555 Å

Emerald green; adamantine; transparent to translucent.

Isotropic, ω 2.01 calculated from reflectance values at 589nm.

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.

Hexagonal: P6₂22

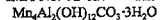
a 10.985 c 15.10 Å

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.

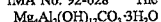
Hexagonal (trigonal): P3₁12 or P3₂12

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.

Hexagonal: P6₂22

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.

Hexagonal (trigonal): P3₁12 or P3₂12

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

Hexagonal (trigonal): P3₁12 or P3₂12

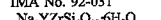
a 10.805 c 22.48 Å

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



Hexagonal (trigonal): R32

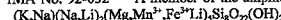
a 10.825 c 15.809 Å

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.

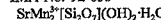
Monoclinic: P2₁/m

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



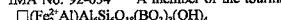
Orthorhombic: Cmc21

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.



Hexagonal (trigonal): R3m

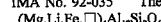
a 15.967 c 7.126 Å

Bluish black; vitreous; transparent.

Uniaxial (-), ω 1.664, ε 1.642.

6.358 (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.



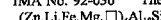
Monoclinic: C2/m

a 7.872 b 16.55 c 5.634 Å β 90.0°

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.



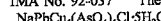
Monoclinic: C2/m

a 7.853 b 16.54 c 5.639 Å β 90.0°

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.

Tetragonal: P4₂22 or P4₂22

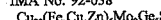
a 10.066 c 39.39 Å

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



Cubic: space group unknown

a 10.64 Å

Megascopic colour unknown; metallic; opaque.

In reflected light: pale yellow to greyish yellow, no anisotropism, no birefractance, nonpleochroic. R: (23.7 %)470nm, (25.5 %)546nm, (25.7 %)589nm, (25.6 %)650nm.
3.07 (10), 2.66 (2), 1.884 (8), 1.603 (4), 1.536 (4), 1.331 (1), 1.220 (2), 1.190 (1).

IMA No. 92-039

$\text{Cu}_{20}(\text{Fe,Zn,Cu})_6\text{W}_2\text{Ge}_2\text{S}_{32}$
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 %)470nm, (23.7 %)546nm, (24.0 %)589nm, (23.8 %)650nm.
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 (1½), 1.192 (½).

IMA No. 92-040

$\text{Na}_4\text{Zn}_2\text{Si}_4\text{O}_{18}\cdot 5\text{H}_2\text{O}$

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.

$(\text{Tl,K})\text{Fe}_3(\text{SO}_4)_2(\text{OH})_6$

Hexagonal (trigonal): R $\bar{3}m$

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

$\text{Ca}(\text{UO}_2)_4(\text{SO}_4)_2(\text{OH})_8\cdot 6\text{H}_2\text{O}$

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.

$\text{PbFe}_3^+(\text{PO}_4)_2(\text{OH,H}_2\text{O})_6$

Hexagonal (trigonal): R $\bar{3}m$

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

$\text{AlF}_3\cdot 3\text{H}_2\text{O}$

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

$\text{Na}_x\text{REE}_y(\text{CO}_3)_z$ 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.

$(\text{Mg,Tl,}\square)(\text{Al,Mg})_2\text{Al}_2\text{Si}_2\text{O}_{18}\cdot (\text{OH})_2\text{B}$ $x \approx 3$

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

$\text{Fe}_{16}\text{O}_{16}(\text{OH})_2(\text{SO}_4)_2$ 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).

$(\text{U,Y})(\text{Tl,Nb,Ta})_2\text{O}_6$

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 %)470nm, (21.5 %)546nm, (22.3 %)589nm, (25.1 %)650nm.

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

$\text{Fe}_2(\text{OH})_2\text{Cl}$

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.