

**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

1991 PROPOSALS

IMA No. 91-001

$\text{Hg}_2^1\text{Hg}_5^2\text{Cr}^{10}\text{O}_5\text{S}_2^2$

Triclinic: P1

a 8.116, b 9.501, c 6.891 Å, α 100.43°, β 110.24°, γ 82.80°

Orange-red; adamantine; transparent.

Biaxial (sign unknown), all indices of refraction are greater than 2.

5.72 (90), 3.373 (60), 3.008 (100), 2.864 (50b), 2.774 (50),

2.536 (50), 2.486 (50), 2.486 (60).

IMA No. 91-003 The niobium analogue of bismutotantalite.

$\text{Bi}(\text{Nb},\text{Ta})\text{O}_6$

Orthorhombic: Pcmn

a 4.992, b 5.677, c 11.731 Å

Black; semi-metallic; transparent in small (<0.03 mm) fragments.

Biaxial (+), α 2.38, β 2.42, γ 2.47, 2V(calc.) 85°.

3.164 (100), 2.934 (90), 2.842 (45), 2.495 (45), 1.769 (45),

1.734 (80).

IMA No. 91-005

$(\text{Zn},\text{Co},\text{Ni})_6(\text{SO}_4)(\text{OH},\text{Cl}) \cdot 11\text{H}_2\text{O}$

Hexagonal: P6₃, P6₃/m or P6₃2

a 8.344, c 21.59 Å

Bright to deep pink; vitreous to pearly; transparent.

Uniaxial (-), ω 1.584, ε 1.544

10.8 (100), 3.300 (90), 2.725 (60), 2.563 (50), 2.351 (40), 1.575 (30).

IMA No. 91-007

$\text{Mn}_2(\text{OH})_2(\text{VO})_2$

Monoclinic: C2/m

a 9.604, b 9.558, c 5.393 Å, β 98.45°

Orange-red; vitreous; transparent.

Biaxial (-), α 1.803, γ 1.810, 2V(meas.) large

4.76 (S), 3.00(M), 2.680 (VS), 2.656 (M), 2.155 (M), 1.565 (M),

1.510 (M).

IMA No. 91-008 The Ba-dominant end-member of the alunite group.

$\text{Ba}_{0.5}\text{Al}_3(\text{SO}_4)_2(\text{OH})_6$

Hexagonal: R3m

a 6.992, c 17.22 Å

White to light yellowish; vitreous; transparent.

Uniaxial (+), ω 1.588, ε 1.604.

5.73 (50), 3.49 (55), 2.98 (100), 2.283 (80), 1.909 (70), 1.747 (60).

IMA No. 91-009 The Ca-dominant end-member of the alunite group.

$\text{Ca}_{0.5}\text{Al}_3(\text{SO}_4)_2(\text{OH})_6$

Hexagonal: R3m

a 6.983, c 16.759 Å

White to light yellowish; vitreous; transparent.

Uniaxial (+), indices of refraction unknown.

4.91 (69), 2.97 (100), 2.231 (51), 1.899 (43), 1.745 (37), 1.375 (40).

IMA No. 91-010

$\text{Ca}(\text{Fe},\text{Mg})_6(\text{SiO}_4)_5(\text{PO}_4)_2$

Hexagonal: R3m

a 6.240, c 26.784 Å

Yellow-brown; vitreous; transparent.

Uniaxial (-), ω 1.770, ε 1.759.

5.100 (60), 3.119 (100), 2.689 (80), 2.558 (100), 2.505 (80),

1.560 (80).

IMA No. 91-012

$\text{Mn}_2\text{SnB}_2\text{Si}_2\text{O}_{20}$

Monoclinic: P2/m

a 28.77, b 7.01, c 13.72(2) Å, β 96.6(2)°.

Orange-yellow; vitreous; transparent.

Biaxial (-), α 1.696, β 1.711, γ 1.715, 2V(meas.) 57°, 2V(calc.) 54°.

3.41 (8), 3.22 (8), 2.83 (10), 2.81 (10), 2.24 (7), 1.750 (6).

IMA No. 91-013

$(\text{Na},\text{K})_2\text{Fe}^{11}\text{TiSi}_6\text{O}_{20}(\text{OH})_{12}\text{H}_2\text{O}$

Orthorhombic: Cmc2₁, Cmc2, or C2cm

a 29.77, b 11.03, c 17.111(5) Å

Colourless (white or grey in aggregates); vitreous; transparent.

Biaxial (-), α 1.532, β 1.548, γ 1.559(2), 2V(meas.) 79°,

2V(calc.) 79°.

10.38 (100), 4.516 (75), 3.220 (65), 3.097 (80), 2.972 (65),

2.773 (90).

IMA No. 91-014

$\text{Na}_4\text{K}_2(\text{Fe},\text{Mn},\text{Ti})_2\text{Si}_4\text{O}_{20}(\text{OH})_4\text{H}_2\text{O}$

Triclinic: P1

a 10.244, b 11.924, c 5.276 Å, α 103.491°, β 96.960°, γ 91.945°.

Olive-green with brownish or yellowish shades; vitreous;

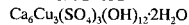
transparent.

Biaxial (+), α 1.569, β 1.574, γ 1.590, 2V(meas.) 58°, 2V(calc.) 59°.

11.57 (100), 3.386 (19), 3.006 (21), 2.992 (28), 2.716 (22),

2.598 (26).

IMA No. 91-031

Monoclinic: P2₁/c (pseudo C2/c)

a 15.122, b 14.358, c 22.063 Å, β 108.68°.

Dark blue; vitreous; transparent.

Biaxial (-), α 1.590, β 1.610, γ 1.619, 2V(meas.) 65°, 2V(calc.) 67°. 3.393 (100), 3.368 (55), 3.200 (53), 3.188 (65), 3.120 (85), 3.098 (57).

IMA No. 91-032



Orthorhombic Immm (pseudocubic)

a 7.544, b 7.558, c 7.560(4) Å

Dark bottle green; vitreous to adamantine; transparent.

Biaxial (-), the indices of refraction are between 1.92 and 1.94. 3.774 (100), 2.671 (35), 2.395 (30), 1.904 (15), 1.697 (60), 1.548 (40).

IMA No. 91-033



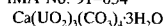
Cubic: Fd3m

a 7.933(5) Å

Colour unknown because of the small grain size; metallic; opaque.

In reflected light: silvery grey, dark grey when highly oxidized; no anisotropy, birefractance, pleochroism or internal reflections; R (56.0%)470nm, (59.5%)546nm, (60.0%)589nm, (62.0%)650nm. 4.595 (21), 2.810 (30), 2.391 (100), 2.301 (25), 1.526 (23), 1.196 (26).

IMA No. 91-034

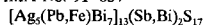
Orthorhombic: Pnmm, Pmn2₁, or P2₁nm

a 15.337, b 17.051, c 6.931 Å

Canary yellow; vitreous; transparent.

Biaxial (-), α 1.603(calc.), β 1.690, γ 1.710, 2V(meas.) 49°. 8.55 (100), 6.94 (50), 4.11 (60), 3.723 (60), 3.460 (50), 2.772 (70).

IMA No. 91-037



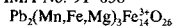
Monoclinic: C2/m or Cm

a 13.515, b 4.098, c 26.000 Å, β 93.00°.

Grey; metallic; opaque.

In reflected light: white, distinct anisotropy, very weak birefractance, no pleochroism, no internal reflections, R_{max} & R_{min}. (42.2, 39.7 %)470nm, (41.4, 38.8 %)546nm, (40.8, 37.9 %) 589nm, (39.8 36.9%)650nm. 3.49 (8), 3.37 (9), 3.24 (9), 2.82 (10), 2.01 (7), 1.992 (8), 1.967 (6).

IMA No. 91-038

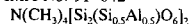
Hexagonal: P6₃/mmc, P6₃mc or P6₂c

a 5.951, c 33.358 Å

Black; submetallic; opaque.

In reflected light: grey with pale brownish tint, moderate anisotropy, weak birefractance, no pleochroism, no internal reflections, R_O & R_E (23.6, 22.3%) 470nm, (22.8, 21.9%) 546nm, (22.2, 21.5%)589nm, (21.3, 21.0%)650nm. 4.168 (55), 3.011 (60), 2.9750 (70), 2.8017 (95), 2.6236 (100), 2.6125 (90).

IMA No. 91-042



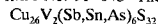
Orthorhombic: I222

a 8.984, b 8.937, c 8.927 Å

White, colourless, light yellow; vitreous; transparent.

Biaxial (-), α 1.529, β(calc.) 1.530, γ 1.531, 2V(meas.) 76°. 6.33 (8), 4.46 (8), 3.66 (10), 2.60 (8), 1.760 (8), 1.351 (8).

IMA No. 91-043 The Sb-dominant member of the colusite group.



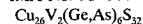
Cubic: P43n

a 10.705 Å

Colour not observed because of the small size; metallic; opaque.

In reflected light: grey with a light-brown tint; no anisotropy, birefractance, pleochroism or internal reflections; R (25.2 %) 470nm, (28.3 %) 546nm, (29.9 %) 589nm, (31.0 %) 650nm. 3.10 (10), 1.892 (9), 1.614 (7), 1.226 (4), 1.094 (6), 1.030 (4).

IMA No. 91-044 The Ge-dominant member of the colusite group.



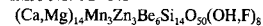
Cubic: P43n

a 10.568 Å

Grey-black; metallic; opaque.

In reflected light: greenish-yellow, olive-yellowish-cream; no internal reflections, anisotropy, birefractance or pleochroism; R (23.8%) 470nm, (27.3%) 546nm, (27.9%)589nm, (27.9%)650nm. 3.05 (10), 2.64 (4), 1.870 (5), 1.595 (3), 1.320 (3), 1.212 (3), 1.079 (3), 1.017 (5).

IMA No. 91-045

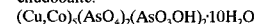
Monoclinic: P2₁/c

a 9.08, b 18.03, c 14.59(4) Å, β 104.8°.

Colourless; vitreous; transparent.

Biaxial (-), α 1.674, β 1.680, γ 1.681, 2V(meas.) 29.0°, 2V(calc.) 44°. 2.863 (100), 2.771 (40), 2.653 (50), 2.388 (50), 2.272 (30), 1.832 (30).

IMA No. 91-046 The Cu-dominant analogue of geigerite and chudobaite.



Triclinic: P1 or P1

a 8.033, b 10.374, c 6.446(5) Å, α 79.62°, β 84.95°, γ 86.21°.

Green; vitreous; transparent.

Biaxial (+), α 1.634, β 1.662, γ 1.720, 2V(meas.) 75°, 2V(calc.) 72°. 10.2 (100), 8.01 (60), 4.001 (50), 3.667 (60), 3.151 (50), 3.063 (50).

IMA No. 91-047



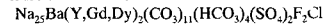
Orthorhombic: Pnma

a 8.894, b 10.855, c 9.079 Å.

Dark red; adamantine to submetallic; opaque to translucent.

In reflected light: red, red internal reflections, strong anisotropy, strong birefractance, no pleochroism. R_{max} and R_{min} are: (4.78, 3.93 %) 481nm, (4.64, 3.86 %)547nm, (8.64, 7.81 %) 591nm, (13.72, 11.78 %) 644nm. 4.14 (M), 3.99 (S), 3.80 (M), 3.47 (MSB), 3.35 (M), 2.813 (VS), 2.537 (M), 2.264 (MSB).

IMA No. 91-048

Hexagonal: P6₃/m

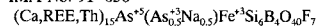
a 8.811, c 37.03(3) Å

Light green to yellowish-green; vitreous; transparent.

Uniaxial (-), ω 1.536, ε 1.510.

4.79 (42), 3.32 (40), 2.829 (100), 2.659 (51b), 2.531 (71b), 2.270 (90).

IMA No. 91-050



Hexagonal: R3m

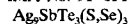
a 10.795, c 27.336(4) Å

Yellowish-green; vitreous; transparent.

Uniaxial (-), ω 1.757, ε 1.722.

2.993 (S), 2.950 (S), 1.839 (MS), 1.802 (MS), 1.686 (MS), 1.572 (MS).

IMA No. 91-051

Monoclinic: P2, P2₁/m or Pm

a 8.900, b 8.302, c 19.49 Å, β 82.98°.

Colour unknown because of the small grain size; metallic; opaque.

In reflected light: grey with faint green-blue hue, anisotropy present with brownish-grey tone, weak birefractance, no pleochroism, no internal reflections, R_{max} and R_{min}. (38.0,34.2%)470nm, (36.6,32.2%)546nm, (35.7,31.8%)589nm, (34.0,30.2%)650nm. 3.82 (6), 2.89 (4), 2.83 (4), 2.22 (10), 2.14 (3), 2.13 (4).

IMA No. 91-052 The Sb-analogue of skutterudite.

CoSb₃

Cubic: Im $\bar{3}$

a 9.0411 Å

Tin-white; metallic; opaque.

In reflected light: tin-white, isotropic, no birefractance, nonpleochroic, no internal reflections, R (59.0 %)470nm, (58.7 %)546nm, (58.7 %)589nm, (58.7 %)650nm.

2.85 (100), 2.01 (80), 1.92 (80), 1.84 (80), 1.50 (80), 1.185 (80), 1.147 (80), 0.780 (100).

IMA No. 91-053

Zn₁₂(CO₃)₄(SO₄)(OH)₁₆

Orthorhombic: P2₂2

a 15.724, b 6.256, c 5.427(5) Å

White; vitreous; translucent.

Biaxial (probably +), α 1.635(3), β 1.650(3), γ could not be measured, 2V about 60°.

15.44 (100), 7.88 (100), 5.25 (20), 2.714 (40), 2.577 (20), 2.397 (20), 1.565(30b).

IMA No. 91-054

Na₂₆Ce₆(SiO₃)₆(PO₃)₆(CO₃)₆(SO₂)O

Hexagonal: R $\bar{3}$

a 16.025, c 19.773 Å

Colourless to pale brown; vitreous; transparent.

Uniaxial (-), ω 1.589, ϵ 1.586.

8.076 (80), 6.544 (90), 4.659 (75), 3.776 (90), 3.159 (85), 2.683 (100).

IMA No. 91-055 A member of the epidote group, related to dollaseite-(Ce).

(Ca,REE)REE(Mg,Fe)MnAlSi₄O₁₁(OH)(F,O)

Monoclinic: P2₁/m

a 8.903, b 5.748, c 10.107 Å, β 113.41°.

Dark greyish-brown; vitreous; transparent.

Biaxial (-), α 1.773, β 1.790, γ 1.803, 2V(meas.) 83°, 2V(calc.) 82°.

9.32 (2), 5.23 (2), 4.67 (2), 3.52 (4), 2.91 (10), 2.73 (7), 2.63 (8), 1.437 (2).

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