

**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.

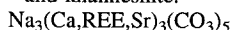
The names of these approved species are considered confidential information until the authors have published their descriptions or released information themselves.

NO OTHER INFORMATION WILL BE RELEASED BY THE COMMISSION.

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

1993 PROPOSALS

IMA No. 93-001 The calcium-analogue of burbankite and khanneshite.



Hexagonal: $P6_3mc$, $P6_2c$ or $P6_3/mmc$

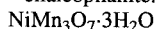
a 10.447 c 6.318 Å

Deep orange; vitreous; translucent.

Uniaxial (-), ω 1.636, ϵ 1.631.

5.20 (4), 3.68 (3), 3.01 (5), 2.601 (10), 2.130 (6), 1.649 (3).

IMA No. 93-002 The nickel-analogue of chalcophanite.



Hexagonal (trigonal): $R\bar{3}$ or $R3$

a 7.514 c 20.52 Å

Very dark brown to almost black; submetallic to vitreous; opaque, but translucent in thin plates. Uniaxial (-), $\omega > 2.00$, ϵ 1.97.

6.84 (10), 4.01 (2), 2.219 (3), 1.884 (2), 1.575 (2).

IMA No. 93-003 The arsenate-analogue of berlinite.



Hexagonal (trigonal): $P3_121$ or $P3_221$

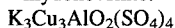
a 5.031 c 11.226 Å

Colourless, white, cream; vitreous; transparent.

Uniaxial (+), ω 1.596, ϵ 1.608.

4.36 (20), 4.06 (31), 3.442 (100), 2.359 (15), 1.873 (16), 1.4202 (11).

IMA No. 93-004 The aluminum-analogue of klyuchevskite.



Monoclinic: $I2$

a 18.423 b 5.139 c 18.690 Å β 101.72°

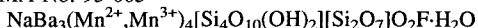
Dark green; vitreous; transparent.

Biaxial (+), α 1.542, β 1.548, γ 1.641, $2V(\text{meas.})$

unknown, $2V(\text{calc.})$ 30°.

9.15 (84), 9.04 (100), 7.20 (52), 3.781 (37), 3.757 (33), 2.786 (21).

IMA No. 93-005



Orthorhombic: $Pnma$

a 23.42 b 12.266 c 7.181 Å

Black with a green shade; vitreous to greasy; translucent.

Biaxial (+), α 1.767, β 1.793, γ 1.871, $2V(\text{meas.})$ 60-65°, $2V(\text{calc.})$ 62°.

4.580 (5), 3.303 (9), 2.999 (10), 2.715 (5), 2.655 (10), 2.156 (4), 1.648 (5).

IMA No. 93-006 A tetragonal polymorph of rooseveltite.



Tetragonal: $I4_1/a$

a 5.085 c 11.69 Å

White to yellowish white; earthy; opaque.

Uniaxial (+), mean $n > 2.04660$ (11), 3.066 (100), 2.546 (12), 1.797 (11), 1.581 (10), 1.551 (17).

IMA No. 93-008



Orthorhombic: Pnma

a 9.0615 b 5.6727 c 7.2672 Å

Colourless to white and yellowish; vitreous; transparent to translucent.

Biaxial, mean n calculated from Gladstone-Dale is 1.308.

4.472 (75), 3.540 (90), 3.183 (100), 2.8982 (80), 2.5362 (65), 2.2822 (65), 2.1631 (70).

IMA No. 93-009 A tetragonal polymorph of bismite.

Tetragonal: P4₂/n or P4₂2₁2

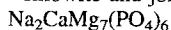
a 8.08 c 6.46 Å

Green, yellowish; adamantine; translucent.

Uniaxial (+), ω 2.13, ε 2.18.

5.73 (7), 3.44 (5), 3.16 (10), 3.01 (4), 2.56 (4dif.), 2.02 (5), 1.902 (6).

IMA No. 93-010 The magnesium analogue of fillowite and johnsomervilleite.

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

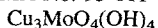
a 14.967 c 42.595 Å

Colourless; vitreous; transparent.

Uniaxial, indices of refraction calculated from reflectance values: n₁ 1.60, n₂ 1.62.

3.694 (S), 3.558 (M), 2.960 (S), 2.753 (S), 2.500 (M), 2.126 (M), 1.851 (M).

IMA No. 93-011



Orthorhombic: Pnmm

a 8.499 b 12.527 c 6.067 Å

Dark green; adamantine; transparent.

Biaxial (+), α slightly < 1.89, β unknown, γ slightly < 1.91, 2V(meas.) 74°.

5.471 (S), 3.754 (S), 3.043 (S), 2.591 (VS), 1.519 (S).

IMA No. 93-013

Monoclinic: P2₁/c

a 8.215 b 11.989 c 6.076 Å β 96.22°

Colourless; vitreous; transparent.

Biaxial (+), α 1.4240, β 1.4320, γ 1.4415, 2V(meas.) 85.5°, 2V(calc.) 85.6°.

6.758 (7), 4.250 (9), 3.643 (8), 3.148 (7), 3.063 (8), 3.030 (7), 2.840 (7), 2.125 (8).

IMA No. 93-016

Cubic: Pa $\bar{3}$

a 6.502 Å

Steel black; metallic; opaque.

In reflected light: bright white with a yellowish tint, moderate anisotropism, no birefractance, nonpleochroic. R: (51.0%)470 nm, (52.6%)546 nm, (52.9%)589 nm, (49.2%)650 nm.

2.89 (70), 1.955 (100), 1.735 (80), 1.250 (80), 1.207 (70), 1.148 (70), 1.054 (70).

IMA No. 93-017

Cubic: Pa $\bar{3}$

a 6.413 Å

Steel black; metallic; opaque.

In reflected light: bright white with bluish tint, no anisotropism, no birefractance, nonpleochroic.

R: (44.3%)470 nm, (46.0%)546 nm, (46.9%)589 nm, (45.5%)650 nm.

2.86 (70), 1.93 (100), 1.235 (80), 1.132 (90), 1.040 (80), 0.9780 (80).

IMA No. 93-018

Hexagonal: P $\bar{3}$ m1

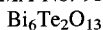
a 3.933 c 5.390 Å

Steel black; metallic; opaque.

In reflected light: bright yellowish white with bluish tint, moderate anisotropism with bluish or yellowish tint, no birefractance, nonpleochroic. R_O & R_E: (41.4, 49.0%)470 nm, (40.2, 48.2%)546 nm, (41.1, 49.0%)589 nm, (45.2, 51.2%)650 nm.

2.85 (100), 2.10 (80), 1.95 (60), 1.580 (70), 1.160 (60), 1.110 (70).

IMA No. 93-019



Orthorhombic: space group unknown

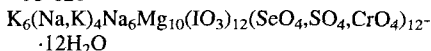
a 5.689 b 10.791 c 5.308 Å

Yellow green to light green; adamantine; transparent.

Biaxial n's > 2. In reflected light, R: (14.8%)470 nm, (13.0%)546 nm, (13.2%)589 nm, (13.6%)650 nm.

3.146 (100), 2.841 (80), 2.694 (20), 1.956 (10), 1.695 (20), 1.631 (10).

IMA No. 93-020 The selenate-dominant analogue of 93-021

Hexagonal: P $\bar{3}$ c1

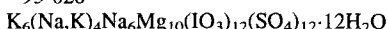
a 9.590 c 27.60 Å

Pale yellow; vitreous; transparent.

Uniaxial (-), ω 1.655, ε 1.642.

13.75 (30), 7.10 (20), 3.974 (16), 3.561 (100), 3.082 (32), 3.058 (39), 2.715 (39).

IMA No. 93-021 The sulphate-dominant analogue of 93-020

Hexagonal: P $\bar{3}$ c1

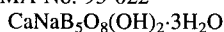
a 9.4643 c 27.336 Å

Pale yellow; vitreous; transparent.

Uniaxial (-), ω 1.622, ε 1.615.

13.67 (50), 7.05 (40), 3.927 (100), 3.515 (24), 3.023 (41), 2.681 (33), 2.3273 (21).

IMA No. 93-022

Monoclinic: $P2_1/c$ a 6.506 b 13.280 c 11.462 Å β 92.97°

White; silky to pearly; translucent.

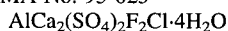
Biaxial (-), α 1.540, β 1.554, γ 1.558, 2V(meas.) 60°, 2V(calc.) 56°.

8.64 (100), 6.62 (30), 4.18 (17), 2.868 (26), 2.845 (16), 2.795 (17), 2.587 (15).

In reflected light: white with light yellow tint, clear anisotropism light yellow with a brown tint, faint bireflectance, nonpleochroic. R_O & R_E : (65.4, 65.2 %)470 nm, (76.7, 74.8 %)546 nm, (80.5, 77.9 %)589 nm, (82.8, 79.5 %)650 nm.

3.726 (34), 3.087 (38), 2.218 (100), 2.159 (57), 1.546 (31), 1.258 (25), 1.256 (26).

IMA No. 93-023

Tetragonal: $I4/m$

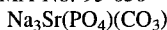
a 6.859 c 13.310 Å

White; vitreous; transparent.

Uniaxial (+), ω 1.509, ϵ 1.526.

6.67 (60), 3.922 (50), 3.729 (40), 3.431 (100), 3.335 (80), 3.052 (40), 2.483 (40).

IMA No. 93-030

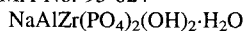
Monoclinic: $P2_1$ a 9.187 b 6.707 c 5.279 Å β 89.98°

Colourless to white; vitreous; transparent.

Biaxial (-), α 1.520, β 1.564, γ 1.565, 2V(meas.) 20°, 2V(calc.) 17°.

3.35 (50), 2.708 (100), 2.648 (90), 2.172 (100), 2.080 (50), 1.891 (80), 1.676 (50), 1.415 (70).

IMA No. 93-024



Monoclinic: space group unknown

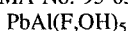
a 20.840 b 9.871 c 11.195 Å β 104.41°

Pale pinkish orange; vitreous; translucent.

Biaxial, n's vary from 1.62 (parallel to fibres) to 1.64 (normal to fibres)

8.865 (40), 4.128 (80), 3.711 (65), 3.465 (60), 3.243 (35), 2.603 (100).

IMA No. 93-031

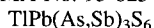
Triclinic: $P1$ or $P\bar{3}$ a 6.259 b 6.791 c 5.053 Å α 90.92° β 107.45° γ 104.45°

White to colourless; vitreous; transparent.

Biaxial (-), α 1.629, β 1.682, γ 1.691, 2V(meas.) 41°, 2V(calc.) 44°.

4.42 (100), 4.05 (35), 3.221 (40), 2.595 (70), 2.190 (65), 2.030 (50), 2.015 (40).

IMA No. 93-025

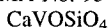
Monoclinic: $P2_1/a$ a 8.444 b 23.97 c 5.844 Å β 113.58°

Brilliant black, but dark red in thin fragments; metallic to submetallic; opaque, but translucent in thin fragments.

In reflected light: greyish white, clearly visible anisotropism from bluish to very weak reddish, visible bireflectance, nonpleochroic. $R_{\min.}$ & $R_{\max.}$: (29.7, 35.4%)470 nm, (28.8, 33.1%)546 nm, (26.7, 30.3%)589 nm, (26.6, 29.9%)650 nm.

5.346 (32), 3.998 (74), 3.816 (54), 3.587 (86), 2.823 (100), 2.778 (84), 2.670 (58).

IMA No. 93-032

Monoclinic: $C2/c$ a 6.526 b 8.691 c 7.032 Å β 113.88°

Deep red; adamantine; transparent.

Biaxial (sign unknown), $\alpha \sim 1.95$, β unknown, γ 2.105, 2V(meas.) unknown.

4.90 (W), 3.22 (VS), 2.97 (M), 2.59 (S), 2.271 (W), 1.641 (W).

IMA No. 93-034

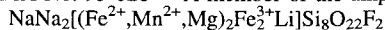
Triclinic: $P1$ or $P\bar{1}$ a 9.245 b 9.684 c 5.510 Å α 97.44° β 100.40° γ 116.70°

White; vitreous; translucent.

Biaxial (-), α 1.602, β 1.607, γ 1.611, 2V(meas.) 73°, 2V(calc.) 83°.

8.44 (80), 8.01 (50), 4.51 (50), 3.76 (70), 2.973 (100), 2.930 (60).

IMA No. 93-026 A member of the amphibole group

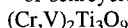
Monoclinic: $C2/m$ a 9.792 b 17.938 c 5.3133 Å β 103.87°

Bluish black to black; vitreous; opaque.

Biaxial (+), α 1.675, β 1.683, γ 1.694, 2V(meas.) 87°, 2V(calc.) 81°.

8.426 (45), 4.481 (54), 3.404 (57), 2.985 (38), 2.710 (100), 2.585 (38), 2.536 (92).

IMA No. 93-035 The chromium-dominant analogue of schreyerite

Monoclinic: $C2/c$, Cc , $P2_1/c$, $P2/c$ or Pc a 7.03 b 5.02 c 18.83 Å β 119.60°

Black; metallic; opaque.

In reflected light: white, faint anisotropism, faint bireflectance, faint pleochroism pale brown. $R_{\min.}$ & $R_{\max.}$: (18.1, 20.1 %)470 nm, (18.5, 19.9 %)546

IMA No. 93-028

Hexagonal: $P6_3/mmc$

a 4.316 c 5.510 Å

White, greyish-black to black (when oxidized); metallic; opaque.

- nm, (18.4, 19.8 %)589 nm, (18.6, 20.9 %)650 nm.
2.88 (2), 2.75 (3), 2.43 (2), 1.635 (3), 1.386 (2).
- IMA No. 93-036
BaCuSi₄O₁₀
Tetragonal: P4/ncc
a 7.441 c 16.133 Å
Blue; vitreous; transparent.
Uniaxial (-), ω 1.633, ε 1.593.
8.055 (100), 4.031 (35), 3.544 (15), 3.200 (21), 2.688 (18), 2.395 (19), 2.016 (26).
- IMA No. 93-037 The K-dominant analogue of gainesite
NaKZr₂(Be,Al,Ca,Mn)(PO₄)₄·2H₂O
Tetragonal: I4₁/amd
a 6.570 c 17.142 Å
Intense bluish purple or pale lilac; vitreous; transparent.
Uniaxial (+), ω 1.624, ε 1.636.
6.161 (100), 4.291 (25), 3.286 (50), 3.039 (30), 2.895 (20).
- IMA No. 93-038
Na(REE,Ca)₂F₆
Hexagonal: P3
a 6.099 c 11.066 Å
Pale pink to colourless; vitreous; transparent.
Uniaxial (+), ω 1.483, ε 1.503.
5.29 (70), 3.036 (100), 2.146 (70), 1.757 (80), 1.152 (40), 0.9189 (40).
- IMA No. 93-040 The PO₄-analogue of atelestite and a monoclinic polymorph of petitjeanite
Bi₂O(OH)(PO₄)
Monoclinic: P2₁/c
a 6.954 b 7.494 c 10.869 Å β 107.00°
White to yellow; adamantine; translucent.
Biaxial (+), α 2.05, β 2.06, γ 2.09, 2V(meas.) 45°, 2V(calc.) 61°.
4.268 (17), 3.271 (51), 3.254 (100), 3.145 (34), 2.727 (29), 1.885 (16).
- IMA No. 93-041
Hg₃¹⁺(CO₃)(OH)·2H₂O
Orthorhombic: Pcab
a 11.130 b 11.139 c 10.725 Å
Black to very dark red-brown; sub-metallic to adamantine; opaque.
In reflected light: grey with slight bluish tinge, weak anisotropism (dull and dark greys and browns), weak to moderate bireflectance, nonpleochroic.
R_{min.} & R_{max.}: (11.4, 12.15 %)470 nm, (10.95, 11.6 %)546 nm, (10.85, 11.5 %)589 nm, (10.7, 11.2 %)650 nm.
4.84 (50), 2.969 (70), 2.786 (70), 2.648 (100), 2.419 (60), 1.580 (50).
- IMA No. 93-042 A regular interstratification of amesite and clinocllore
(Mg,Al,Fe²⁺)₉(Si,Al)₆O₁₅(OH)₁₂
Monoclinic: Cm
a 5.323 b 9.214 c 21.45 Å β 94.43°
Colourless to very pale green; nacreous; translucent.
Biaxial (+), α 1.575, β 1.575, γ 1.581, 2V(meas.) 0°, 2V(calc.) 0°.
7.1 (100), 4.61 (60), 3.560 (80), 2.557 (40), 2.427 (60), 1.536 (70).
- IMA No. 93-044
NaSbO₃ Isostructural with ilmenite and geikielite
Hexagonal: R3
a 5.301 c 15.932 Å
Colourless; pearly; transparent.
Uniaxial (-), ω 1.184, ε 1.631.
5.30 (53), 3.00 (55), 2.650 (67), 2.365 (69), 1.874 (100), 1.471 (69).
- IMA No. 93-045 The Fe-analogue of leonite
K₂Fe(SO₄)₂·4H₂O
Monoclinic: C2/m
a 11.843 b 9.552 c 9.945 Å β 94.89°
Colourless to light yellow; vitreous; transparent.
Biaxial (+), α 1.497, β 1.501, γ 1.509, 2V(meas.) 73°, 2V(calc.) 71°.
4.776 (30), 3.504 (52), 3.439 (100), 3.330 (48), 3.051 (29), 2.405 (30), 2.389 (49).
- IMA No. 93-046
(Rh,Ir,Pt)₃S₄
Monoclinic: F2/m
a 13.44 b 10.749 c 10.448 Å β 118.32°
Megascopic colour not observed; metallic; opaque.
In reflected light: pale slightly brownish grey, weak anisotropism in greys and browns, weak bireflectance, pleochroism weak. R₁ & R₂: (47.2, 48.9 %)470 nm, (48.4, 50.3 %)546 nm, (49.1, 50.7 %)589 nm, (49.8, 51.0 %)650 nm.
3.156 (100), 3.081 (100), 2.957 (90), 2.234 (60), 1.871 (80), 1.791 (90), 1.532 (70).
- IMA No. 93-047
Cu₂Te⁶⁺O₄(OH)₂
Monoclinic: P2₁/n
a 9.095 b 5.206 c 4.604 Å β 98.69°
Medium leaf green; adamantine; transparent.
In reflected light: pale grey, weak anisotropism with brown rotation tints, weak bireflectance, nonpleochroic. The mean index of refraction calculated from the reflectances at 589 nm is 2.00.
4.506 (40), 4.337 (60), 3.838 (50), 2.891 (70), 2.598 (100), 1.834 (40), 1.713 (40), 1.500 (40).
- IMA No. 93-048
Bi₂(Fe³⁺,Cu)₂O(OH)₃(AsO₄)₂
Triclinic: P1 or P1
a 4.569 b 6.162 c 8.993 Å α 94.56°
β 99.68° γ 94.31°

Brown-yellow; adamantine; transparent to translucent. Biaxial (-), α 2.04, β 2.10 (calc.), γ 2.11, 2V(meas.) 45°.

8.822 (62), 3.749 (100), 3.596 (77), 3.468 (58), 2.903 (69), 2.810 (51), 2.685 (48).

IMA No. 93-049

$\text{Ca}_3\text{B}_2\text{O}_6$

Hexagonal: $R\bar{3}c$ or $R3c$

a 8.638 c 11.850 Å

Greyish white; vitreous; transparent.

Uniaxial (-), ω 1.726, ϵ 1.630.

2.915 (100), 2.756 (61), 2.493 (44), 2.160 (19), 2.044 (21), 1.976 (18), 1.895 (75).

IMA No. 93-050

$\text{Ti}_5\text{Sb}_9(\text{As,Sb})_4\text{S}_{22}$

Triclinic: $P\bar{1}$

a 7.393 b 8.707 c 17.58 Å α 103.81° β 91.79° γ 109.50°

Black; metallic; opaque.

In reflected light: white, distinct to strong anisotropism with blue or blue-green colours, weak to medium bireflectance, pleochroism white to white with grey-blue tints. $R_{\min.}$ & $R_{\max.}$: (34.0, 36.7 %)470 nm, (32.0, 34.9 %)546 nm, (30.5, 33.0 %)589 nm, (28.1, 29.7 %)650 nm.

3.459 (100), 3.388 (64), 3.177 (54), 3.076 (65), 2.802 (44), 2.287 (57), 1.736 (38).

IMA No. 93-051

$\text{Fe}_4\text{S}_8\text{O}$

Monoclinic: space group unknown

a 9.717 b 7.280 c 6.559 Å β 95.00°

Yellow; metallic; opaque.

In reflected light: yellow, strong anisotropism with orange, yellow-orange and greenish grey colours, distinct bireflectance, pleochroism greyish brown, orange, yellow orange. $R_{\min.}$ & $R_{\max.}$: (19.5, 32.1 %)470 nm, (23.8, 36.8 %)546 nm, (24.6, 37.4 %)589 nm, (25.1, 37.3 %)650 nm.

2.709 (10), 2.419 (8), 2.323 (7), 1.92 (6), 1.758 (8), 0.9605 (6), 0.9576 (7).

IMA No. 93-052

CaAl_4O_7

Monoclinic: $C2/c$

a 12.94 b 8.910 c 5.446 Å β 107.0°

Colourless to white; vitreous; transparent.

Biaxial (+), α 1.6178, β 1.6184, γ 1.6516, 2V(meas.) 12°, 2V(calc.) 15.5° (synthetic material).

4.460 (43), 3.609 (13), 3.515 (100), 2.882 (13), 2.605 (36), 2.440 (21), 1.764 (20).

IMA No. 93-053

Pb_2OCO_3

Orthorhombic: $P2_122_1$ or $P2_12_12_1$

a 9.294 b 9.000 c 5.133 Å

White; waxy; transparent to opaque.

The mean index of refraction calculated from the

reflectance value at 589 nm is 2.09.

6.49 (30), 4.02 (40), 3.215 (100), 3.181 (90), 2.858 (40), 2.564 (35).

IMA No. 93-054 The Se-analogue of pyrite

FeSe_2

Cubic: $Pa\bar{3}$

a 5.783 Å

Black; metallic; opaque.

In reflected light: pink-yellow, no anisotropism, no bireflectance, nonpleochroic. R: (42.4 %)470 nm, (42.7 %)546 nm, (45.7 %)589 nm, (49.8 %)650 nm.

2.888 (50), 2.588 (100), 2.364 (80), 2.045 (40), 1.743 (50), 1.546 (60), 1.1131 (40).

IMA No. 93-055

$\text{Na}_3\text{K}_6\text{Ti}_2\text{Al}_2\text{Si}_8\text{O}_{26}\text{Cl}_3$

Monoclinic: $C2/m$

a 10.37 b 16.32 c 9.16 Å β 105.6°

Colourless; vitreous; transparent. Biaxial (+), α 1.601, β 1.625, γ 1.654, 2V(meas.) 85°, 2V(calc.) 86°.

8.22 (71), 3.50 (42), 3.157 (35), 3.049 (100), 2.900 (71), 2.835 (84).

IMA No. 93-056

$\text{Pb}_{18}\text{Ba}_2\text{Ca}_5\text{Mn}_2\text{Fe}_2^+\text{Si}_{30}(\text{O,OH})_{96}\text{Cl}$

Hexagonal: $R\bar{3}$

a 9.863 c 79.45 Å

Colourless; adamantine; transparent.

Uniaxial (-), ω 1.845, ϵ 1.815.

13.4 (50), 4.43 (30), 3.98 (30), 3.32 (100), 3.11 (40), 2.969 (40), 2.671 (80).

IMA No. 93-057

$\text{Pd}_3\text{Ni}_2\text{As}_3$

Hexagonal: $P6_3/m$, $P6_3$ or $P6_322$

a 8.406 c 6.740 Å

Megascopic colour not observed; metallic; opaque.

In reflected light: rose, distinct anisotropism from light grey to greyish-brown, no bireflectance, nonpleochroic. $R_{\min.}$ & $R_{\max.}$: (48.4, 50.2 %)470 nm, (51.2, 53.2 %)546 nm, (53.2, 55.3 %)589 nm, (56.6, 58.7 %)650 nm.

2.626 (10), 2.477 (10), 2.429 (8), 2.283 (7), 1.978 (7), 1.818 (7), 1.781 (7).

IMA No. 93-058

$\text{Na}_{10}(\text{Mn,Ca,Sr})\text{Ti}_3\text{Nb}_3(\text{Si}_2\text{O}_7)_6(\text{OH})_2\text{F}\cdot 12\text{H}_2\text{O}$

Monoclinic: Pm , $P2$ or $P2/m$

a 5.468 b 7.18 c 31.1 Å β 94.0°

Colourless, white, silvery, pale pink or cream; greasy to pearly; transparent to translucent.

Biaxial (+), α 1.608, β 1.630, γ 1.660, 2V(meas.) 82°, 2V(calc.) 83°.

15.56 (9), 5.16 (6), 3.11 (10), 2.850 (7), 2.665 (7), 2.627 (7), 2.217 (6), 1.795 (6).

IMA No. 93-059

$\text{Sb}_2\text{O}_3\cdot\text{WO}_3$ or Sb_2WO_6

Orthorhombic: probably $P2_12_1$
 a 8.59 b 9.58 c 6.12 Å

Green to dark green; pearly to dull; translucent to opaque.

Biaxial (+), α 2.285, β 2.40, γ 2.58, $2V(\text{meas.})$ large, $2V(\text{calc.})$ 82° . 3.32 (10), 3.06 (10), 2.98 (4), 2.73 (6), 2.46 (5), 1.919 (4).

IMA No. 93-060 A monoclinic polymorph of atacamite, botallackite and paratacamite

$\text{Cu}_2(\text{OH})_3\text{Cl}$

Monoclinic: $P2_1/n$

a 6.157 b 6.814 c 9.104 Å β 99.65°

Green to dark greenish black; adamantine; translucent to transparent.

Biaxial (-), indices of refraction could not be measured because mineral reacts with immersion liquids, $2V(\text{meas.})$ 75°.

5.44 (100), 2.887 (40), 2.767 (60), 2.742 (70), 2.266 (60), 2.243 (50), 1.704 (50).

IMA No. 93-061

$(\text{Ba,Pb})_6(\text{Cu,Fe,Ni})_{25}\text{S}_{27}$

Cubic: $\text{Pm}\bar{3}\text{m}$
 a 10.373 Å

Megascopic colour unknown; metallic; opaque.

In reflected light: pale brownish grey, no anisotropism, no bireflectance, nonpleochroic.

R: (22.0 %)470 nm, (24.85 %)546 nm, (26.2 %)589 nm, (27.55 %)650 nm.

3.460 (40), 3.281 (40), 2.996 (90), 2.378 (90), 1.835 (100), 1.779 (40).

IMA No. 93-062

$(\text{Pd,Ag})_2\text{Te}$

Tetragonal: $P4_22_2$, $P4_2/m$ or $P4_2$

a 8.913 c 6.098 Å

Megascopic colour unknown; metallic; opaque.

In reflected light: brownish-rose, distinct to strong anisotropism from white to rose-brown, distinct bireflectance, pleochroic from brownish-grey to violet-rose. $R_{\text{min.}}$ & $R_{\text{max.}}$: (38.7, 48.7%)470 nm, (44.0, 55.5 %)546 nm, (47.3, 58.2 %)589 nm, (50.7, 60.7 %)650 nm.

3.051 (6), 2.825 (10), 2.553 (4), 2.231 (6), 2.042 (5), 1.326 (3).

NOTICE

Dr J. A. Mandarino retired as Chairman of the Commission on New Minerals and Mineral Names (CNMMN) of the International Mineralogical Association on 31 December 1994. After that date, all proposals for new minerals should be sent to the new Chairman:

Dr J. D. Grice,
 Mineral Sciences Division,
 Canadian Museum of Nature,
 P. O. Box 3443,
 Station 'D',
 Ottawa, Ontario,
 K1P 6P4 CANADA.

Dr E. H. Nickel remains the Vice-chairman of the CNMMN and will continue to handle redefinitions, discreditations and revalidations. Proposals of these kinds should be sent to:

Dr E. H. Nickel,
 Division of Mineral Products,
 CSIRO,
 Private Bag,
 P. O. Wembley,
 Western Australia 6014,
 AUSTRALIA.

Dr C. E. S. Arps retired as Secretary of the CNMMN on 31 December 1994. The new Secretary is:

Dr W. D. Birch,
 Department of Mineralogy and Petrology,
 Museum of Victoria,
 285 Russell Street,
 Melbourne,
 Victoria,
 AUSTRALIA.