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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, 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.
$Na_3(Ca,REE,Sr)_3(CO_3)_5$
Hexagonal: $P6_3mc$, $P6_2c$ or $P6_3mmc$
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.
$NiMn_3O_7 \cdot 3\ H_2O$
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.
$AlAsO_4$
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.
$K_3Cu_3AlO_2(SO_4)_4$
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(meas.) unknown, 2V(calc.) 30°.
9.15 (84), 9.04 (100), 7.20 (52), 3.781 (37), 3.757 (33), 2.786 (21).

IMA No. 93-005
$NaBa_3(Mn^{2+},Mn^{3+})_4[Si_4O_{10}(OH)_2][Si_2O_7]O_2F \cdot H_2O$
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(meas.) 60–65°, 2V(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.
$BiAsO_4$
Tetragonal: $I4_1/a$
a 5.085, c 11.69 Å
White to yellowish white; earthy; opaque.
Uniaxial (+), mean n > 2.0.
4.660 (11), 3.066 (100), 2.546 (12), 1.797 (11), 1.581 (10), 1.551 (17).

IMA No. 93-008
NH_4BF_4
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.
Bi_2O_3
Tetragonal: $P4_2/n$ or $P4_22_12$
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.
$Na_2CaMg_7(PO_4)_6$
Hexagonal (trigonal): $R\bar{3}$
a 14.967, c 42.595 Å
Colourless; vitreous; transparent.
Uniaxial, indices of refraction calculated from reflectance values: n_1 1.60, n_2 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
$Cu_3MoO_4(OH)_4$
Orthorhombic: Pnnm
a 8.499, b 12.527, c 6.067 Å
Dark green; adamantine; transparent.
Biaxial (+), α slightly < 1.89, β unknown, γ < 1.91, 2V(meas.) 74°.
5.471 (S), 3.754 (S), 3.043 (S), 2.591 (VS), 1.519 (S).

IMA No. 93-013
$CaSrAl(F,OH)_7$
Monoclinic: $P2_1/c$
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
IrBiTe
Cubic: Pa3
a 6.502 Å
Steel black; metallic; opaque.
In reflected light: bright white with a yellowish tint, moderate anisotropism, no bireflectance, 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
$Ir_{1-x}Te_2$ x = 0.24
Cubic: Pa3
a 6.413 Å
Steel black; metallic; opaque.
In reflected light: bright white with bluish tint, no anisotropism, no bireflectance, 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
$IrTe_2$
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 bireflectance, 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
$Bi_6Te_2O_{13}$
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.
$K_6(Na,K)_4Na_6Mg_{10}(IO_3)_{12}(SeO_4,SO_4,CrO_4)_{12} \cdot 12\ H_2O$
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 sulfate-dominant analogue of 93-020.
$K_6(Na,K)_4Na_6Mg_{10}(IO_3)_{12}(SO_4)_{12} \cdot 12\ H_2O$
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
$CaNaB_5O_8(OH)_2 \cdot 3\ H_2O$
Monoclinic: $P2_1/c$
a 6.50, 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).

IMA No. 93-023
$AlCa_2(SO_4)_2F_2Cl \cdot 4\ H_2O$
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. 93-024
$NaAlZr(PO_4)_2(OH)_2 \cdot H_2O$
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. 93-025
$TlPb(As,Sb)_3S_6$
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. 93-026
A member of the amphibole group.
$NaNa_2[(Fe^{2+},Mn^{2+},Mg)_2Fe^{3+}_2Li]Si_8O_{22}F_2$
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. 93-028
AuSn
Hexagonal: $P6_3/mmc$
a 4.316, c 5.510 Å
White, greyish-black to black (when oxidized); metallic; opaque.
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. 93-030
$Na_3Sr(PO_4)(CO_3)$
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. 93-031
$PbAl(F,OH)_5$
Triclinic: P1 or $P\bar{1}$
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. 93-032
$CaVOSiO_4$
Monoclinic: C2/c
a 6.526, b 8.691, c 7.032 Å, β 113.88°
Deep red; adamantine; transparent.
Biaxial (sign unknown), α ~ 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
$(Y,Ca,NaREE)_4Si_5O_{15} \cdot n\ H_2O$ n ~ 4
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. 93-035
The chromium-dominant analogue of schreyerite.
$(Cr,V)_2Ti_3O_9$
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 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
$BaCuSi_4O_{10}$
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.
$NaKZr_2(Be,Al,Ca,Mn)(PO_4)_4 \cdot 2\ H_2O$
Tetragonal: $I4_1/amd$
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
$Na(REE,Ca)_2F$
Hexagonal: $P\bar{3}$
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 PO_4-analogue of atelestite and a monoclinic polymorph of petitjeanite.
$Bi_2O(OH)(PO_4)$
Monoclinic: $P2_1/c$
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
$Hg_3^{1+}(CO_3)(OH) \cdot 2\ H_2O$
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 clinochlore.
$(Mg,Al,Fe^{2+})_9(Si,Al)_6O_{15}(OH)_{12}$
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
$NaSbO_3$
Isostructural with ilmenite and geikielite
Hexagonal: $R\bar{3}$
a 5.301, c 15.932 Å
Colourless; pearly; transparent.
Uniaxial (–), ω 1.1.84, 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.
$K_2Fe(SO_4)_2 \cdot 4\,H_2O$
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
$(Rh,Ir,Pt)_3S_4$
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. R_1 & R_2: (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
$Cu_2Te^{6+}O_4(OH)_2$
Monoclinic: $P2_1/n$
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
$Bi_2(Fe^{3+},Cu)_2O(OH)_3(AsO_4)_2$
Triclinic: P1 or $P\bar{1}$
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
$Ca_3B_2O_6$
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
$Tl_5Sb_9(As,Sb)_4S_{22}$
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
Fe_4S_8O
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, pleoch-

roism 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: Pa3
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
$Na_3K_6Ti_2Al_2Si_8O_{26}Cl_3$
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
$Pb_{18}Ba_2Ca_5Mn_2Fe_2^{3+}Si_{30}(O,OH)_{96}Cl$
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
$Pd_3Ni_2As_3$
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
$Na_{10}(Mn,Ca,Sr)Ti_3Nb_3(Si_2O_7)_6(OH)_2F \cdot 12\ H_2O$
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
$Sb_2O_3 \cdot WO_3$ or Sb_2WO_6
Orthorhombic: probably $P22_12_1$
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(meas.) large, 2V(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.
$Cu_2(OH)_3Cl$
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(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
$(Ba,Pb)_6(Cu,Fe,Ni)_{25}S_{27}$
Cubic: Pm3m

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
$(Pd,Ag)_2Te$
Tetragonal: $P4_222$, $P4_2/m$ 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. $R_{min.}$ & $R_{max.}$: (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 retires 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 retires 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 3000
AUSTRALIA