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New minerals approved in 2000 by the Commission on New Minerals and Mineral Names International Mineralogical Association

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Each mineral is described in the following format:

IMA No.
Chemical Formula (any relationship to other minerals; structure analysis)
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

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2000 Proposals

IMA No. **2000-001**

$Cu_2Fe^{+3}(As^{+5}O_4)(As^{+3}O_2(OH)_2 \bullet H_2O$

New-structure type

Orthorhombic: *Pnma*

a 9.553, *b* 13.099, *c* 8.0640 Å

Pistachio green; vitreous; transparent

Biaxial (–), α 1.80(5), β 1.84(5), γ 1.86(5), 2V(meas) = 65(5)°, 2V(calc) = 69(3)°

6.88(25), 6.161(90), 3.861(20), 3.231(40), 3.080(100), 2.700(25), 2.211(25)

IMA No. **2000-002**

$NaCu_4(AsO_4)_3$

Alluaudite-wyllieite group; structure

Monoclinic: *C2/c*

a 12.051, *b* 12.434, *c* 7.2662 Å, β 117.94°

Dark-blue; strong vitreous; translucent

Biaxial (–), α 1.76, β 1.92, γ 1.96, 2V(calc) 49.5°

6.22(13), 3.60(21), 3.43(100), 3.21(35), 2.791(24), 2.696(18), 2.683(30)

IMA No. **2000-003**

$Ba_3[(Si,Al)_4O_8]OCl[Cl,(H_2O)]_4$

Cymrite-like; structure

Hexagonal: $P6_3mc$

a 5.243, *c* 29.859 Å

Light-blue grey; vitreous; translucent

Uniaxial (–), ω 1.642, ε 1.594

14.67(100), 3.883(100), 3.357(50), 2.988(60), 2.887(50), 2.616(70)

IMA No. **2000-004**

$Bi(OH)SO_4 \bullet H_2O$

Second natural bismuth sulfate

Monoclinic: $P2_1/n$

a 6.0118, *b* 13.3355, *c* 6.4854 Å, β 112.91°

Light beige to light grey; vitreous; translucent

η 1.78

5.453(42), 5.193(32), 5.115(37), 4.260(100), 3.335(42), 3.113(36), 2.915(22)

IMA No. **2000-005**

$Ca_2Mn_3O_2(AsO_4)_2(CO_3) \bullet 3H_2O$

Mitridatite type

Monoclinic: *Cm*

a 11.253, *b* 19.628, *c* 8.932 Å, β 100.05°

Dark red-brown to black; vitreous; translucent

Biaxial (–), α 1.757, β ≈ γ > 1.80, $\Delta_{\beta,\gamma}$ = 0.004, 2V(meas) ~ 32°

8.796(100), 5.654(31), 2.934(76), 2.886(23), 2.816(24), 2.769(39), 2.201(57)

IMA No. **2000-006**

$Mg(HCO_2)_2 \bullet 2H_2O$

Second natural formate

Monoclinic: $P2_1/c$

a 8.64, *b* 7.15, *c* 9.38 Å, β 98.0°

White; vitreous; translucent

Biaxial (+), α 1.465, β 1.486, γ 1.516, 2V(calc) 81(5)°

4.90(9), 4.64(8), 4.30(7), 3.68(8), 3.40(10), 3.05(4), 2.87(4)

IMA No. **2000-007**

$(Mn,Mg)_{25.5}[(V,As)O_4]_3(SiO_4)_3O_5(OH)_{20}$

Similar to mcgovernite; structure

Trigonal: $R\bar{3}c$

a 8.259, *c* 204 Å

Bright yellow to orange; vitreous; transparent

Uniaxial (–), η 1.787

4.13(70), 3.46(60), 3.26(80), 2.86(100), 2.38(60), 2.35(50), 1.559(90)

IMA No. **2000-008**

$KBSi_2O_6$

Similar to Li-A(BW) zeolite; structure

Orthorhombic: $P2_12_12_1$

a 9.9630, *b* 10.4348, *c* 4.7044 Å

Colourless; vitreous; transparent

Biaxial (–), α 1.561, β 1.563, γ 1.564, 2V(meas) 51°, 2V(calc) 70°

3.944(5), 3.495(8), 3.282(10), 3.149(4), 2.704(4), 2.293(4)

IMA No. **2000-009**

$NaBSiO_4$

Similar to kalsilite and beryllonite

Hexagonal: $P6_3$

a 13.8964, *c* 7.7001 Å

White, colourless in thin fragments; vitreous; transparent or slightly turbid

Uniaxial (–), ω 1.612, ε 1.615

3.86(6), 3.61(6), 2.780(10), 2.320(7), 2.216(9), 1.928(5), 1.721(7)

IMA No. **2000-010**

$(Na,H_3O)_{15}(Ca,Mn,REE)_6Fe^{3+}{}_2Zr_3(\square,Zr)(\square,Si)Si_{24}O_{66}(O,OH)_6Cl{\bullet}nH_2O$ (n = 2-3)

Eudialyte group

Trigonal: *R*3*m*

a 14.167, *c* 30.081 Å

Yellow; vitreous; transparent

Uniaxial (+), ω 1.612, ε 1.615

6.41(41), 4.30(91), 3.521(57), 3.205(44), 2.963(92), 2.841(100), 2.588(37)

IMA No. **2000-011**

$KCaCu_5(AsO_4)_4[As(OH)_2O_2]_2{\bullet}H_2O$

Polymorph of calcioandyrobertsite; structure

Orthorhombic: *Pnma*

a 19.576, *b* 10.0536, *c* 9.921 Å

Intense blue; vitreous; transparent

Biaxial (–), α 1.715, β 1.730, γ 1.735; 2V(meas) 55°, 2V(calc) 60°

7.064(70), 6.642(60), 4.810(70), 4.469(90), 3.950(60), 3.105(100), 2.748(90)

IMA No. **2000-012**

$Bi_2Fe^{3+}(Co,Fe^{3+})(O,OH)_2(OH)_2(AsO_4)_2$

Co analogue of neustädtelite; structure

Triclinic: $P\bar{1}$

a 9.156, *b* 6.148, *c* 9.338 Å, α 83.24, β 70.56, γ 86.91°

Brown; adamantine; transparent to translucent

Biaxial (–), α 2.02, β 2.09(calc), γ 2.12, 2V(meas) 65°

8.757(55), 3.752(100), 3.552(55), 3.507(44), 2.901(96), 2.750(39), 2.667(72)

IMA No. **2000-014**

$Pd_3Pb_2S_2$

Related to parkerite $Ni_3Bi_2S_2$

Monoclinic: *C*2/*m*

a 11.673, *b* 8.323, *c* 8.419 Å, β 135.38°

Cream with a brownish tint (in reflected light in air); opaque; metallic

In reflected light (air): brownish; internal reflections not observed, anisotropy weak. R_{min} and R_{max}: 45.2 – 46.1 % (460 nm), 46.3 – 47.2 % (540 nm), 47.4 – 48.5 % (580 nm), 49.3 – 49.8 % (640 nm)

5.953(6), 4.144(10), 3.379(4), 2.917(9), 2.413(8), 2.365(7), 2.082(5)

IMA No. **2000-015**

$Na_3Sr(La,Ce)FeSi_6O_{17}$

Nordite group

Orthorhombic: *Pcca*

a 14.440, *b* 5.191, *c* 19.86 Å

Colourless, pale brownish; vitreous; transparent

Biaxial (–), α 1.624, β 1.637, γ 1.644, 2V(meas) 60°, 2V(calc) 72°

7.20(40), 4.21(100), 3.323(82), 2.964(88), 2.873(99), 2.595(58), 2.442(44),

IMA No. **2000-016**

$(Ti,Fe,Mg,Mn)_{1-x}Ti_2O_5$

Pseudobrookite group

Orthorhombic: *Pban*

a 9.765, *b* 3.732, *c* 9.957 Å

Dark grey

In reflected light (air): blue-grey, no internal reflections, anisotropic. R_{min} and R_{max}: 11.5 – 11.1 % (460 nm), 10.3 – (10.3) % (540 nm), 10.1 – 10.2 % (580 nm), 10.3 – 10.4 % (640 nm)

3.47(7), 2.75(10), 1.965(3), 1.871(9), 1.727(9), 1.548(3)

IMA No. **2000-017**

$Na_{11}Ca_9(Fe^{3+},Fe^{2+})_2Zr_3Nb[Si_{25}O_{73}](OH,H_2O,Cl,O)_5$

Eudialyte group; structure

Trigonal: *R*3*m*

a 14.255, *c* 30.170 Å

Dark brown to brownish-black; vitreous; translucent

Uniaxial (–), ω 1616, ε 1.620

6.43(39), 4.31(69), 3.218(56), 3.036(42), 2.977(81), 2.854(100), 2.602(44)

IMA No. **2000-018**

$VOSO_4(H_2O)_5$

Polymorph of minasragrite; structure

Orthorhombic: $Pmn2_1$

a 7.246, *b* 9.333, *c* 6.210 Å

Bright blue to pale blue; vitreous

Biaxial (–), α 1.529, β 1.534, γ 1.534, 2V(meas) 2°, 2V(calc) 0°

4.70(100), 3.734(20), 3.322(50), 2.865(40), 2.602(30), 2.363(20), 2.030(20)

IMA No. **2000-019**

$Cu_5(UO_2)_6(SO_4)_3(OH)_{16}{\bullet}14H_2O$

Second natural uranyl-sulfate

Triclinic: $P1$ or $P\bar{1}$
a 13.754, *b* 9.866, *c* 8.595, α 103.84, β 90.12, γ 106.75°
Grey olive; opaque
Biaxial (+), α 1.725, β 1.730, γ 1.787, 2V(calc) 33.8°
9.13(100), 7.09(26), 5.511(22), 4.566(80), 3.443(17), 3.367(15), 3.046(26)

IMA No. **2000-020**

$Fe_4[AsO_3OH]_5[AsO_2(OH)_2]_2 \bullet 20H_2O$
Orthorhombic
a 10.676, *b* 19.027, *c* 10.012 Å
White-beige; aggregates are earthy; opaque
η 1.615 (calc)
9.50(100), 9.31(85), 6.81(24), 5.45(23), 4.221(35), 3.586(39), 3.302(24)

IMA No. **2000-021**

$Ca_3(Si,Fe^{3+},Al)[SO_4][B(OH)_4](OH,O)_6 \bullet 12H_2O$
Ettringite group
Trigonal (pseudo-hexagonal): $P31c$ (by analogy)
a 11.14, *c* 20.99 Å
Light grey with violet shade; vitreous, earthy in aggregates; translucent
Uniaxial (+), ω 1.523, ε 1.532
9.70(8), 3.85(6), 3.040(8), 2.736(6), 2.596(10), 2.374(6), 2.121(9)

IMA No. **2000-022**

$Ca_2Mn^{2+}Fe^{3+}Si_4O_{12}(OH)(H_2O)_2$
4-membered silicate rings; structure
Triclinic: $P\bar{1}$
a 9.960, *b* 13.875, *c* 6.562, α 133.19, β 101.50, γ 66.27°
Dark brown (clusters), light brown (thinner crystals); vitreous
Biaxial (–), α 1.667, β 1.679, γ 1.690, 2V(meas) 89°, 2V(calc) 87°
9.07(100), 8.24(90), 5.00(30), 3.192(30), 3.126(70), 3.095(70), 2.781(60)

IMA No. **2000-023**

$Ba_6Fe^{3+}{}_3Si_8O_{23}(CO_3)_2Cl_3 \bullet H_2O$
Unique structure
Trigonal: $P3ml$
a 10.740, *c* 7.0950 Å
Jet black to a dirty grey-brown; vitreous to adamantine; opaque to translucent
Uniaxial (–), ω 1.723, ε 1.711
3.892(100), 3.148(40), 2.820(90), 2.685(80), 2.208(40), 2.136(40), 1.705(35)

IMA No. **2000-024**

$Na_2BeSi_4O_{10} \bullet 4H_2O$
4-membered and 8-membered silicate rings; structure
Orthorhombic: $P2_12_12_1$
a 9.722, *b* 10.142, *c* 12.030 Å
Colourless, whitish; vitreous; transparent
Biaxial (+), α 1.499, β 1.507, γ 1.511, 2V(meas) 65°, 2V(calc) 70°
6.11(80), 5.97(100), 5.07(35), 3.46(45), 3.09(70), 3.06(50), 2.988(60)

IMA No. **2000-025**

$(Sr,Ca)_2Na[Al_5Si_5O_{20}] \bullet 7H_2O$
Thomsonite series zeolite; structure
Orthorhombic: $Pcnn$
a 13.050, *b* 13.123, *c* 13.241 Å
Colourless; vitreous; transparent
Biaxial (+), α 1.528, β 1.532, γ 1.540, 2V(meas) 62°, 2V(calc) 71°
6.63(7), 4.66(8), 3.49(9), 3.19(8), 2.960(10), 2.860(10), 2.691(10)

IMA No. **2000-026**

$(Mn,Li)_4(Ta,Sn)_4(Ta,Nb)_8O_{32}$
Wodginite group
Monoclinic: $C2/c$
a 9.5104, *b* 11.5196, *c* 5.1179 Å, β 91.221(48)°
Reddish brown; vitreous; translucent
η > 2.0
3.644(46), 2.976(100), 2.966(95), 2.465(36), 1.767(17), 1.715(23), 1.455(18)

IMA No. **2000-027**

$Sr_4TiTi_4Si_4O_{22}$
Perrierite group; structure
Monoclinic: $P2_1/a$ (pseudo $C2/m$)
a 13.848, *b* 5.626, *c* 11.878 Å, β 114.19°
Grey with a blue tin; adamantine; transparent
Pale green with a yellow tint in thin section

3.62(60), 3.16(70), 3.09(95), 3.01(90), 2.96 (95), 2.71(100), 2.17(90)

IMA No. **2000-028**

$Na_{27}K_8Ca_{12}Fe_3Zr_6Si_{52}O_{144}(O,OH,H_2O)_6Cl_2$

Eudialyte group; structure

Trigonal: *R*3*m*
a 14.249, *c* 60.969 Å
Pink; vitreous; transparent
Uniaxial (+), ω 1.598, ε 1.600
6.48(47), 4.345(81), 3.565(41), 3.249(57), 2.987(100), 2.861(70), 2.695(40)

IMA No. **2000-029**

$Cu_5Cl_2(OH)_8(H_2O)_2$

Similar to atacamite; structure

Monoclinic: *C*2/*m*
a 10.301, *b* 6.758, *c* 8.835 Å, β 111.53°
Pale blue; vitreous; transparent
Biaxial (–), α 1.724, β 1.745, γ 1.750, 2V(meas) 33°, 2V(calc) 52°
8.20(100), 5.52(100), 5.03(40), 2.883(80), 2.693(40), 2.263(40), 2.188(50), 1.767(40)

IMA No. **2000-030**

$CaMg_3(Al_5Mg)(Si_6O_{18})(BO_3)_3(OH)_3(OH)$

Tourmaline group; structure

Trigonal: *R*3*m*
a 15.954, *c* 7.214 Å
Orange; vitreous; transparent
Uniaxial (–), ω 1.646, ε 1.624
6.38(50), 4.981(50), 4.596(50), 4.234(90), 3.978(100), 3.491(70), 2.969(80), 2.582(90)

IMA No. **2000-031**

$K_2Mn(Nb,Ti)_4(Si_4O_{12})_2(OH)_4{\bullet}6H_2O$

Labuntsovite group; structure

Monoclinic: *C*2/*m*
a 14.551, *b* 14.001, *c* 15.702 Å, β 117.6°
Brown to pink; vitreous; translucent
Biaxial (+), α 1.683, β 1.692, γ 1.775, 2V(meas) 40°, 2V(calc) 38°
6.99(100), 6.43(25), 4.936(28), 3.227(89), 3.123(68), 2.607(25), 2.520(29)

IMA No. **2000-032**

$Mg_3(PO_4)_2{\bullet}22H_2O$-1*A*2

Synthetic equivalent

Triclinic: $P\bar{1}$
a 6.932, *b* 6.925, *c* 16.154 Å, α 82.21, β 89.70, γ 119.51°
Colourless; vitreous; transparent
Biaxial (–), α 1.459, β 1.470, γ 1.470, 2V(meas) 25°, 2V(calc) 0°
7.98(100), 5.32(63), 3.19(45), 2.896(33), 2.867(30), 2.728(32), 2.658(37)

IMA No. **2000-033**

$(Ba,Na,K)(Al,Mg)_2(Si,Al)_4O_{10}(OH)_2$

Mica group

Monoclinic: *C*2/*c*
a 5.2068, *b* 9.027, *c* 19.963 Å, β 95.87°
Light grey to silver; glassy; transparent
Biaxial (–), α(calc) 1.600, β 1.619, γ 1.622, 2V(meas) 43°
4.471(22), 4.302(21), 3.879(26), 3.730(27), 3.487(23), 2.596(46), 2.566(100), 1.504(63)

IMA No. **2000-034**

$(UO_2)_2CO_3(OH)_2{\bullet}4H_2O$

Unique composition

Monoclinic: $P2_1/c$
a 4.1425, *b* 14.098, *c* 18.374 Å, β 103.62°
Canary yellow; vitreous; transparent
Biaxial (–), α 1.583, β 1.669, γ 1.712, 2V(calc) 67.4°
8.95(65), 7.54(63), 4.546(96), 4.262(60), 3.463(62), 3.322(100), 3.029(85), 2.273(62)

IMA No. **2000-035**

$Na_2Ba_2FeTiSi_2O_7(CO_3)(OH)_3F$

Unique structure

Triclinic: *P*1
a 5.399, *b* 7.016, *c* 16.254 Å, α 102.44, β 93.18, γ 90.10°
Yellowish-brown; vitreous or pearly; translucent
Biaxial (+), α 1.671, β 1.694, γ 1.734, 2V(meas) 71°, 2V(calc) 76°
3.910(44), 3.186(100), 3.055(38), 2.797(29), 2.738(62), 2.695(32), 2.677(29)

IMA No. **2000-036**

$Zn_2Mg_2Fe_4Sb_2O_{14}(OH)_2$

Isostructural with nolanite

Hexagonal; $P6_3/mmc$, $P6_3mc$ or $P\bar{6}2c$

a 5.9899, *c* 9.353 Å
Black; submetallic; opaque
In reflected light: grey with no internal reflections, anisotropy moderate. R_{min} and R_{max}: 12.21 – 13.62 % (460 nm), 11.78 – 12.92 % (540 nm), 11.67 – 12.67 % (580 nm), 11.39 – 12.25 % (640 nm)
3.474(34), 2.994(43), 2.673(44), 2.522(100), 1.517(33), 1.497(54)

IMA No. **2000-037**

$Ca_{19}(Al,Mg)_{13}[SiO_4]_{10}[Si_2O_7]_4(F,OH)_{10}$
F-analogue of vesuvianite; structure
Tetragonal: *P4/nnc*
a 15.510, *c* 11.779 Å
Colourless to silky white; vitreous; transparent
Uniaxial (–), ω 1.702, ε 1.699
3.465(30), 3.040(30), 2.945(35), 2.743(90), 2.589(50), 2.453(100)

IMA No. **2000-038**

$(Fe,Ni)_2P$
Isostructural with rhodarsenide; structure
Orthorhombic: *Pnma*
a 5.748, *b* 3.548, *c* 6.661 Å
Light straw-yellow; metallic; opaque
In reflected light: creamy with no internal reflections, anisotropy distinct. R_{min} and R_{max}: 36.8 – 46.7 % (460 nm), 39.2 – 48.2 % (540 nm), 40.7 – 49.6 % (580 nm), 43.0 – 51.9 % (640 nm)
2.238(100), 2.120(80), 2.073(70), 1.884(50), 1.843(40), 1.788(40), 1.774(40), 1.758(40)

IMA No. **2000-039**

$Ca_2(C_2O_4)Cl_2 \bullet 2H_2O$
New structure-type
Monoclinic: *I2/m*
a 6.933, *b* 7.372, *c* 7.446 Å, β 94.5°
Colourless; vitreous; transparent
Biaxial (–), α 1.565, β 1.645, γ 1.725, 2V(meas) 88°, 2V(calc) 86°
5.24(60), 3.670(30), 2.945(100), 2.905(50), 2.619(50), 2.516(40), 2.339(30), 2.323(30)

IMA No. **2000-040**

$Ca_{19}Mn^{3+}(Al, Mn^{3+})_{10}(Mg,Mn^{2+})_2Si_{18}O_{69}(OH)_9$
Mn-analogue of vesuvianite; structure
Tetragonal: *P4/n* and/or *P4nc*
a 15.575, *c* 11.824 Å
Deep maroon-red; vitreous; transparent
Uniaxial (–), ω 1.731, ε 1.719
2.956(100), 2.756(87), 2.756(94), 2.753(60), 2.604(67), 2.598(66), 2.598(62)

IMA No. **2000-041**

$CaCe(Fe^{3+},Fe^{2+},Al)_3[SiO_4][Si_2O_7]O(OH)$
Fe^{3+}-analogue of allanite-(Ce); structure
Monoclinic: $P2_1/m$
a 8.962, *b* 5.836, *c* 10.182 Å, β 115.02°
Black; vitreous to resinous; opaque to translucent
Biaxial (–), α 1.825, β 1.855, γ 1.880, 2V(calc) 48.2°
3.54(70), 2.93(100), 2.715(80), 2.637(70), 2.155(80), 1.908(70), 1.651(90)

IMA No. **2000-042**

$Mg_6Cr_2(OH)_{16}Cl_2 \bullet 4H_2O$
Hydrotalcite group; structure
Trigonal: $R\bar{3}m$
a 3.103, *c* 24.111 Å
Magenta to purple; vitreous to waxy; transparent
Uniaxial (–), ω 1.555, ε 1.535
8.04(100), 4.020(48), 2.624(3), 2.349(5), 2.007(6)

IMA No. **2000-044**

$Cu_{1.6}Pb_{1.6}Bi_{6.4}S_{12}$
Bismuthinite-aikinite derivative; structure
Orthorhombic: $Pmc2_1$
a 4.007, *b* 44.81, *c* 11.513 Å
Grey; metallic; opaque
In reflected light: greyish white with no internal reflections, anisotropy distinct. R_{min} and R_{max}: 39.15 – 48.36 % (470 nm), 38.26 – 47.65 % (546 nm), 37.23 – 47.14 % (589 nm), 36.55 – 45.71 % (650 nm)
3.631(99), 3.586(55), 3.552(85), 3.156(59), 3.136(95), 2.836(100)

IMA No. **2000-046**

$(Na,H_3O,K,Sr,Ba)_2(Ti,Nb)_2[Si_4O_{12}]$
$OH,O)_2 \bullet 3H_2O$
Labuntsovite group; structure
Monoclinic: *Cm*
a 14.604, *b* 14.274, *c* 7.933 Å, β 117.40°
Colourless, white, light brown; vitreous; transparent to translucent

Biaxial (+), α 1.658, β 1.668, γ 1.770, 2V(meas) 25°, 2V(calc) 36°
7.01(44), 6.46(100), 4.991(28), 3.954(30), 3.236(98), 3.179(33), 3.160(38)

IMA No. **2000-047**
$Mg(V^{5+}{}_2O_6)\bullet 7H_2O$
Structural relationships to munirite and rossite
Monoclinic: *C*2/*c*
a 38.954, *b* 7.2010, *c* 16.3465 Å, β 97.602°
Light golden-brown; vitreous; translucent
Biaxial (–), α 1.612, β 1.674, γ 1.710, 2V(meas) 78°, 2V(calc) 73°
9.70(100), 8.12(60), 5.84(100), 4.061(50), 3.139(90), 2.920(60), 2.707(50)

IMA No. **2000-048**
$K_6Fe_{24}S_{26}(Cl,S)$
Cl-analogue of bartonite; structure
Tetragonal: *I*4/*mmm*
a 10.3810, *c* 20.614 Å
Black-brown; submetallic; opaque
In reflected light: yellowish-brown with no internal reflections, no anisotropy. R: 10.2 % (460 nm), 13.1 % (540 nm), 14.8 % (580 nm), 17.1 % (640 nm)
9.25(33), 5.97(65), 3.121(45), 2.986(100), 2.380(38), 2.374(57), 1.834(51), 1.830(82)

IMA No. **2000-049**
$NaCa_2Mg_5(Si_7Al)O_{22}F_2$
Amphibole group; structure
Monoclinic: *C*2/*m*
a 9.8471, *b* 18.0171, *c* 5.2681 Å, β 104.845°
Intense yellow; vitreous to resinous; transparent
Biaxial (–), α 1.606, β 1.617, γ 1.625, 2V(calc) 80.4°
8.40(57), 3.271(48), 3.125(100), 2.938(17), 2.807(33), 2.703(25), 1.894(18)

IMA No. **2000-050**
$KCdCu_7O_2(SeO_3)_2Cl_9$
Similarity to ilinskite; structure
Hexagonal: $P6_3/mmc$
a 8.7805, *c* 15.521 Å
Dark red; vitreous to metalloid; opaque to translucent
No optical measurements possible, η(calc) 1.804
7.78(100), 6.82(50), 4.391(80), 3.814(80), 3.066(70), 2.582(50), 2.501(60), 2.190(50)

IMA No. **2000-051**
$Ca_2ScSn(Si_2O_7)(Si_2O_6OH)$
Unique structure
Triclinic: *C*1
a 10.028, *b* 8.408, *c* 13.339 Å, α 90.01, β 109.10, γ 90.00°
Colourless to white; vitreous; transparent to translucent
η 1.74
5.18(53), 3.146(100), 3.089(63), 2.901(19), 2.595(34), 2.142(17)

IMA No. **00-D**
$Ba_2Na(La,Ce)_2Fe^{2+}Ti_2Si_8O_{26}(OH,O,F)\bullet H_2O$
Orthorhombic: probably *Ccmm*
Joaquinite group
a 10.539, *b* 9.680, *c* 22.345 Å
Brown; silky; transparent
Biaxial (+), α 1.754, β 1.760, γ 1.797, 2V(meas) 40°, 2V(calc) 45°
5.58(67), 3.00(9), 2.95(17), 2.91(10), 2.80(100), 2.232(8), 1.596(13)

Previous years proposals

IMA No. **1999-033**
$(Ca,Y)_3Al[PO_3OH,CO_3](CO_3)(OH)_6\bullet 12H_2O$
Ettringite group, structure
Hexagonal: $P6_3$
a 10.828, *c* 10.516 Å
Colourless to white; vitreous; transparent
Uniaxial (–), ω 1.532, ε 1.503
9.38(100), 4.59(70), 3.77(50), 3.36(55), 2.491(80), 2.143(65)

IMA No. **1998-011**
$(Fe^{2+}, Fe^{3+}, Mg)_{11}(PO_4)_2O_2(OH)_{16}\bullet 4H_2O$
New-structure type
Monoclinic: $P2_1/n$
a 16.950, *b* 11.650, *c* 6.2660 Å, β 90.000°
Dark green; vitreous; translucent
Biaxial (–), α 1.722, β 1.730, γ 1.737, 2V(meas) > 50, 2V(calc) 86°

9.61(53), 6.87(77), 5.83(89), 4.805(100), 3.787(62), 3.533(84), 2.868(66)

IMA No. **1998-029**

$(Ce,REE,Ca)_4(Mg,Fe^{2+})(Cr,Fe^{3+})_2Ti,Nb)_2Si_4O_{22}$

Cr analogue of chevkinite-(Ce), structure

Monoclinic: *C2/m*

a 13.397, *b* 5.697, *c* 11.041 Å, β 100.53°

Black; resinous; translucent in thin fragments

In reflected light: grey with weak brown internal reflections, no anisotropy. R: 11.2 % (470 nm), 10.9 % (546 nm), 10.7 % (589 nm), 10.3 % (650 nm)

5.44(40), 3.62(35), 3.18(50), 3.15(40), 3.12(35), 2.849(40), 2.715(100), 2.160(45)

IMA No. **1998-050**

$Na_4K_4[Ba_2(H_2O,OH)_2]Mg[Ti_8(Si_4O_{12})_4(O,OH)_8]\bullet 8H_2O$

Labuntsovite group, structure

Monoclinic: *C2/m*

a 14.292, *b* 13.750, *c* 7.792 Å, β 117.03°

Colourless, yellowish, pink or light orange; vitreous; translucent or transparent

Biaxial (+), α 1.688, β 1.692, γ 1.802, 2V(meas) 37°, 2V(calc) 36°

6.94(51), 3.175(100), 3.093(57), 3.083(55), 3.024(51), 2.576(48)

IMA No. **1998-051**

$Na_4K_4[Ba_2(H_2O,OH)_2]Fe[Ti_8(Si_4O_{12})_4(O,OH)_8]\bullet 8H_2O$

Labuntsovite group, structure

Monoclinic: *C2/m*

a 14.249, *b* 13.791, *c* 7.777 Å, β 116.82°

Orange; vitreous; translucent or transparent

Biaxial (+), α 1.686, β 1.696, γ 1.835, 2V(meas) 32°, 2V(calc) 32°

6.95(56), 6.35(34), 3.169(100), 3.100(53), 3.032(53), 2.585(58)

IMA No. **1998-052**

$Na_2K_2Ba_{1-x}Ti_4(Si_4O_{12})_2(O,OH)_4\bullet 5H_2O$

Labuntsovite group, structure

Monoclinic: *C2/m*

a 14.216, *b* 13.755, *c* 7.767 Å, β 116.7°

Bright orange to reddish-orange; vitreous; transparent

Biaxial (+), α 1.683, β 1.690, γ 1.820, 2V(meas) 37°, 2V(calc) 28°

6.93(26), 6.31(28), 3.16(100), 3.09(24), 3.02(25), 2.577(25)