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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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The information given here is provided by the Commission on New Minerals and Mineral Names (CNMMN), International Mineralogical Association (IMA), for comparative purposes and as a service to mineralogists working on new species. Each mineral is described in the following format:

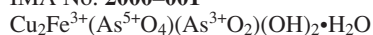
IMA Number
Chemical Formula (any relationship to other minerals; structure analysis)

Crystal system, space group
unit-cell parameters
Color; luster; diaphaneity
Optical properties
Strongest lines in the X-ray powder-diffraction pattern [*d* in Å(*l*)]

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.

2000 PROPOSALS

IMA No. **2000-001**



New
structure-type

Orthorhombic: *Pnma*

a 9.553, *b* 13.099, *c* 8.0640 Å

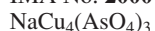
Pistachio green; vitreous; transparent

Biaxial (–), α 1.80(5), β 1.84(5), γ 1.86(5), $2V(\text{meas.})$

= 65(5)°, $2V(\text{calc.}) = 69(3)^\circ$

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**



Alluaudite–wylleite group
structure determined

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, $2V(\text{calc.})$ 49.5°

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

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- IMA No. **2000-003**
 $\text{Ba}_3[(\text{Si},\text{Al})_4\text{O}_8]\text{OCl}[\text{Cl},(\text{H}_2\text{O})]_4$ Cymrite-like structure determined
 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**
 $\text{Bi}(\text{OH})\text{SO}_4 \cdot \text{H}_2\text{O}$ 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
 n 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**
 $\text{Ca}_2\text{Mn}_3\text{O}_2(\text{AsO}_4)_2(\text{CO}_3) \cdot 3\text{H}_2\text{O}$ 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, $\beta \approx \gamma > 1.80$, $\Delta_{\beta,\gamma} = 0.004$, $2V(\text{meas.}) \sim 32^\circ$
 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**
 $\text{Mg}(\text{HCO}_2)_2 \cdot 2\text{H}_2\text{O}$ 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, $2V(\text{calc.})$ 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**
 $(\text{Mn},\text{Mg})_{25.5}[(\text{V},\text{As})\text{O}_4]_3(\text{SiO}_4)_3\text{O}_5(\text{OH})_{20}$ Similar to mcgovernite structure determined
 Trigonal: $R\bar{3}c$
 a 8.259, c 204 Å
 Bright yellow to orange; vitreous; transparent
 Uniaxial (-), n 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 determined
 Orthorhombic: $P2_12_12_1$
 a 9.9630, b 10.4348, c 4.7044 Å
 Colorless; vitreous; transparent
 Biaxial (-), α 1.561, β 1.563, γ 1.564, $2V(\text{meas.})$ 51°, $2V(\text{calc.})$ 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 structure determined
 Hexagonal: $P6_3$
 a 13.8964, c 7.7001 Å
 White, colorless in thin fragments; vitreous; transparent or slightly turbid
 Uniaxial (-), ω 1.591, ϵ 1.582
 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**
 $(\text{Na},\text{H}_3\text{O})_{15}(\text{Ca},\text{Mn},\text{REE})_6\text{Fe}^{3+}_2\text{Zr}_3(\square,\text{Zr})(\square,\text{Si})\text{Si}_{24}\text{O}_{66}(\text{O},\text{OH})_6\text{Cl} \cdot n\text{H}_2\text{O}$ ($2 < n < 3$) Eudialyte group
 Trigonal: $R3m$
 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**
 $\text{KCaCu}_5(\text{AsO}_4)_4[\text{As}(\text{OH})_2\text{O}_2]_2 \cdot \text{H}_2\text{O}$ Polymorph of calcioandryobertsite structure determined
 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, $2V(\text{meas.})$ 55°, $2V(\text{calc.})$ 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**
 $\text{Bi}_2\text{Fe}^{3+}(\text{Co},\text{Fe}^{3+})(\text{O},\text{OH})_2(\text{OH})_2(\text{AsO}_4)_2$ Co-dominant analogue of neustädtelite structure determined
 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, $2V(\text{meas.})$ 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**
Pd₃Pb₂S₂ Related to parkerite, Ni₃Bi₂S₂
- Monoclinic: *C2/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**
Na₃Sr(La,Ce)FeSi₆O₁₇ Nordite group
- Orthorhombic: *Pcca*
a 14.440, *b* 5.191, *c* 19.86 Å
Colorless, pale brownish; vitreous; transparent
Biaxial (–), α 1.624, β 1.637, γ 1.644, 2*V*(meas.) 60°, 2*V*(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}Ti₂O₅ 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**
Na₁₁Ca₉(Fe³⁺,Fe²⁺)₂Zr₃Nb[Si₂₅O₇₃](OH,H₂O,Cl,O)₅ Eudialyte group
- Trigonal: *R3m* structure determined
a 14.255, *c* 30.170 Å
Dark brown to brownish black; vitreous; translucent
Uniaxial (–), ω 1.616, 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**
VO₄(H₂O)₅ Polymorph of minasragrite
structure determined
- Orthorhombic: *Pmn2₁*
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, 2*V*(meas.) 2°, 2*V*(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**
Cu₅(UO₂)₆(SO₄)₃(OH)₁₆•14H₂O Second natural uranyl sulfate
- Triclinic: *P1* or *P1̄*
a 13.754, *b* 9.866, *c* 8.595 Å, α 103.84, β 90.12, γ 106.75°
Grey olive; opaque
Biaxial (+), α 1.725, β 1.730, γ 1.787, 2*V*(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**
Fe₄[AsO₃OH]₅[AsO₂(OH)₂]₂•20 H₂O
- Orthorhombic
a 10.676, *b* 19.027, *c* 10.012 Å
White-beige; aggregates are earthy; opaque
n 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**
Ca₃(Si,Fe³⁺,Al)[SO₄][B(OH)₄](OH,O)₆•12H₂O 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**
Ca₂Mn²⁺Fe³⁺Si₄O₁₂(OH)(H₂O)₂ Four-membered silicate rings structure determined
- Triclinic: *P1̄*
a 9.960, *b* 13.875, *c* 6.562 Å, 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, 2*V*(meas.) 89°, 2*V*(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**
Ba₆Fe³⁺₃Si₈O₂₃(CO₃)₂Cl₃•H₂O Unique structure
- Trigonal: *P3m1*
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**
 $\text{Na}_2\text{BeSi}_4\text{O}_{10}\cdot 4\text{H}_2\text{O}$ Four-membered and eight-membered silicate rings structure determined
 Orthorhombic: $P2_12_12_1$
 a 9.722, b 10.142, c 12.030 Å
 Colorless, whitish; vitreous; transparent
 Biaxial (+), α 1.499, β 1.507, γ 1.511, $2V(\text{meas.})$ 65°, $2V(\text{calc.})$ 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**
 $(\text{Sr},\text{Ca})_2\text{Na}[\text{Al}_5\text{Si}_5\text{O}_{20}]\cdot 7\text{H}_2\text{O}$ Thomsonite-series zeolite structure determined
 Orthorhombic: $Pcnn$
 a 13.050, b 13.123, c 13.241 Å
 Colorless; vitreous; transparent
 Biaxial (+), α 1.528, β 1.532, γ 1.540, $2V(\text{meas.})$ 62°, $2V(\text{calc.})$ 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**
 $(\text{Mn},\text{Li})_4(\text{Ta},\text{Sn})_4(\text{Ta},\text{Nb})_8\text{O}_{32}$ Wodginite group
 Monoclinic: $C2/c$
 a 9.5104, b 11.5196, c 5.1179 Å, β 91.221(48)°
 Reddish brown; vitreous; translucent
 $n > 2.0$
 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**
 $\text{Sr}_4\text{TiTi}_4\text{Si}_4\text{O}_{22}$ Perrierite group
 Monoclinic: $P2_1/a$ (pseudo- $C2/m$) structure determined
 a 13.848, b 5.626, c 11.878 Å, β 114.19°
 Grey with a blue tint; 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**
 $\text{Na}_{27}\text{K}_8\text{Ca}_{12}\text{Fe}_3\text{Zr}_6\text{Si}_52\text{O}_{144}(\text{O},\text{OH},\text{H}_2\text{O})_6\text{Cl}_2$ Eudialyte group structure determined
 Trigonal: $R3m$
 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**
 $\text{Cu}_5\text{Cl}_2(\text{OH})_8(\text{H}_2\text{O})_2$ Similar to atacamite structure determined
 Monoclinic: $C2/m$
 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, $2V(\text{meas.})$ 33°, $2V(\text{calc.})$ 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**
 $\text{CaMg}_3(\text{Al}_5\text{Mg})(\text{Si}_6\text{O}_{18})(\text{BO}_3)_3(\text{OH})_3(\text{OH})$ Tourmaline group structure determined
 Trigonal: $R3m$
 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**
 $\text{K}_2\text{Mn}(\text{Nb},\text{Ti})_4(\text{Si}_4\text{O}_{12})_2(\text{OH})_4\cdot 6\text{H}_2\text{O}$ Labuntsovite group structure determined
 Monoclinic: $C2/m$
 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, $2V(\text{meas.})$ 40°, $2V(\text{calc.})$ 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**
 $\text{Mg}_3(\text{PO}_4)_2\cdot 22\text{H}_2\text{O}-1\text{A2}$ 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°
 Colorless; vitreous; transparent
 Biaxial (-), α 1.459, β 1.470, γ 1.470, $2V(\text{meas.})$ 25°, $2V(\text{calc.})$ 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**
 $(\text{Ba},\text{Na},\text{K})(\text{Al},\text{Mg})_2(\text{Si},\text{Al})_4\text{O}_{10}(\text{OH})_2$ Mica group
 Monoclinic: $C2/c$
 a 5.2068, b 9.027, c 19.963 Å, β 95.87°
 Light grey to silver; glassy; transparent
 Biaxial (-), $\alpha(\text{calc.})$ 1.600, β 1.619, γ 1.622, $2V(\text{meas.})$ 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) ₂ CO ₃ (OH) ₂ •4H ₂ O	Unique composition	IMA No. 2000-039 Ca ₂ (C ₂ O ₄)Cl ₂ •2H ₂ O	New structure-type
Monoclinic: <i>P2₁/c</i> <i>a</i> 4.1425, <i>b</i> 14.098, <i>c</i> 18.374 Å, β 103.62° Canary yellow; vitreous; transparent Biaxial (–), α 1.583, β 1.669, γ 1.712, 2 <i>V</i> (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)		Monoclinic: <i>I2/m</i> <i>a</i> 6.933, <i>b</i> 7.372, <i>c</i> 7.446 Å, β 94.5° Colorless; vitreous; transparent Biaxial (–), α 1.565, β 1.645, γ 1.725, 2 <i>V</i> (meas.) 88°, 2 <i>V</i> (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. 2000-035 Na ₂ Ba ₂ FeTiSi ₂ O ₇ (CO ₃)(OH) ₃ F	Unique structure	IMA No. 2000-040 Ca ₁₉ Mn ³⁺ (Al, Mn ³⁺) ₁₀ (Mg, Mn ²⁺) ₂ Si ₁₈ O ₆₉ (OH) ₉	Mn-dominant analogue of vesuvianite structuredetermined
Triclinic: <i>P1</i> <i>a</i> 5.399, <i>b</i> 7.016, <i>c</i> 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, 2 <i>V</i> (meas.) 71°, 2 <i>V</i> (calc.) 76° 3.910(44), 3.186(100), 3.055(38), 2.797(29), 2.738(62), 2.695(32), 2.677(29)		Tetragonal: <i>P4/n</i> or <i>P4nc</i> (or both) <i>a</i> 15.575, <i>c</i> 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. 2000-036 Zn ₂ Mg ₂ Fe ₄ Sb ₂ O ₁₄ (OH) ₂	Isostructural with nolanite	IMA No. 2000-041 CaCe(Fe ³⁺ , Fe ²⁺ , Al) ₃ [SiO ₄][Si ₂ O ₇]O(OH) Fe ³⁺ -analogue of allanite-(Ce)	structure determined
Hexagonal: <i>P6₃/mmc</i> , <i>P6₃mc</i> or <i>P6̄2c</i> <i>a</i> 5.9899, <i>c</i> 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)		Monoclinic: <i>P2₁/m</i> <i>a</i> 8.962, <i>b</i> 5.836, <i>c</i> 10.182 Å, β 115.02° Black; vitreous to resinous; opaque to translucent Biaxial (–), α 1.825, β 1.855, γ 1.880, 2 <i>V</i> (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. 2000-037 Ca ₁₉ (Al, Mg) ₁₃ [SiO ₄] ₁₀ [Si ₂ O ₇] ₄ (F, OH) ₁₀	F-analogue of vesuvianite structure determined	IMA No. 2000-042 Mg ₆ Cr ₂ (OH) ₁₆ Cl ₂ •4H ₂ O	Hydrotalcite group structure determined
Tetragonal: <i>P4/nnc</i> <i>a</i> 15.510, <i>c</i> 11.779 Å Colorless 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)		Trigonal: <i>R3̄m</i> <i>a</i> 3.103, <i>c</i> 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. 2000-038 (Fe, Ni) ₂ P	Isostructural with rhodarsenide structure determined	IMA No. 2000-044 Cu _{1.6} Pb _{1.6} Bi _{6.4} S ₁₂	Bismuthinite–aikinite derivative structure determined
Orthorhombic: <i>Pnma</i> <i>a</i> 5.748, <i>b</i> 3.548, <i>c</i> 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)		Orthorhombic: <i>Pmc2₁</i> <i>a</i> 4.007, <i>b</i> 44.81, <i>c</i> 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,H₃O,K,Sr,Ba)₂(Ti,Nb)₂ Labuntsovite group
[Si₄O₁₂](OH,O)₂•3H₂O structure determined
- Monoclinic: *Cm*
a 14.604, *b* 14.274, *c* 7.933 Å, β 117.40°
Colorless, white, light brown; vitreous; transparent to translucent
Biaxial (+), α 1.658, β 1.668, γ 1.770, 2*V*(meas.) 25°, 2*V*(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(V⁵⁺O₆)•7H₂O Structural relationships
to munirite and rossite
- Monoclinic: *C2/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, 2*V*(meas.) 78°, 2*V*(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**
K₆Fe₂₄S₂₆(Cl,S) Cl-dominant analogue of bartonite
structure determined
- Tetragonal: *I4/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**
NaCa₂Mg₅(Si₇Al)O₂₂F₂ Amphibole group
structure determined
- Monoclinic: *C2/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, 2*V*(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**
KCdCu₇O₂(SeO₃)₂Cl₉ Similarity to ilinskite
structure determined
- Hexagonal: *P6₃/mmc*
a 8.7805, *c* 15.521 Å
Dark red; vitreous to metalloid; opaque to translucent
No optical measurements possible, *n* (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**
Ca₂ScSn(Si₂O₇)(Si₂O₆OH) Unique structure
- Triclinic: *C1*
a 10.028, *b* 8.408, *c* 13.339 Å, α 90.01, β 109.10, γ 90.00°
Colorless to white; vitreous; transparent to translucent
n 1.74
5.18(53), 3.146(100), 3.089(63), 2.901(19), 2.595(34), 2.142(17)
- IMA No. 2000-D**
Ba₂Na(La,Ce)₂Fe²⁺Ti₂Si₈O₂₆(OH,O,F)•H₂O Joaquinite
group
- Orthorhombic: probably *Ccmm*
a 10.539, *b* 9.680, *c* 22.345 Å
Brown; silky; transparent
Biaxial (+), α 1.754, β 1.760, γ 1.797, 2*V*(meas.) 40°, 2*V*(calc.) 45°
5.58(67), 3.00(9), 2.95(17), 2.91(10), 2.80(100), 2.232(8), 1.596(13)
- PROPOSALS APPROVED IN PREVIOUS YEARS
- IMA No. 1999-033**
(Ca,Y)₃Al[PO₃OH,CO₃](CO₃)(OH)₆•12H₂O Ettringite
group
structure determined
- Hexagonal: *P6₃*
a 10.828, *c* 10.516 Å
Colorless 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**
(Fe²⁺,Fe³⁺,Mg)₁₁(PO₄)₂O₂(OH)₁₆•4H₂O New
structure-type
- Monoclinic: *P2₁/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, 2*V*(meas.) > 50, 2*V*(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,Fe²⁺) Cr-dominant analogue
(Cr,Fe³⁺)₂(Ti,Nb)₂Si₄O₂₂ of chevkinite-(Ce)
structure determined
- 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**

$\text{Na}_4\text{K}_4[\text{Ba}_2(\text{H}_2\text{O},\text{OH})_2]$ Labuntsovite group
 $\text{Mg}[\text{Ti}_8(\text{Si}_4\text{O}_{12})_4(\text{O},\text{OH})_8]\cdot 8\text{H}_2\text{O}$ structure determined

Monoclinic: $C2/m$

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

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

Biaxial (+), α 1.688, β 1.692, γ 1.802, $2V(\text{meas.})$ 37°, $2V(\text{calc.})$ 36°

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

IMA No. **1998-051**

$\text{Na}_4\text{K}_4[\text{Ba}_2(\text{H}_2\text{O},\text{OH})_2]\text{Fe}[\text{Ti}_8(\text{Si}_4\text{O}_{12})_4(\text{O},\text{OH})_8]\cdot 8\text{H}_2\text{O}$
 Labuntsovite group
 structure determined

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, $2V(\text{meas.})$ 32°, $2V(\text{calc.})$ 32°

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

IMA No. **1998-052**

$\text{Na}_2\text{K}_2\text{Ba}_{1-x}\text{Ti}_4(\text{Si}_4\text{O}_{12})_2(\text{O},\text{OH})_4\cdot 5\text{H}_2\text{O}$ Labuntsovite
 group
 structure determined

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, $2V(\text{meas.})$ 37°, $2V(\text{calc.})$ 28°

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

IMA No. **1997-016**

$\text{MnNa}_3\text{P}_3\text{O}_{10}\cdot 12\text{H}_2\text{O}$

Monoclinic: $P2_1/n$

a 14.71, b 9.33, c 15.13 Å, β 89.8°

Colorless; vitreous; transparent

Biaxial (–), α 1.453, γ 1.459, $2V$ and β not measured
 10.50(75), 7.36(100), 3.316(60), 3.162(50), 2.889(60), 2.391(48)

IMA No. **1988-047**

$\text{Bi}_{8-x}(\text{Se},\text{Te},\text{S})_{7+x}$

Tetradymite group

Trigonal: $P\bar{3}m1$, $P3m1$, $P321$

a 4.292, c 87.18 Å

Steel-grey; metallic; opaque

In reflected light: light yellow, no internal reflections, anisotropy moderate. R_{min} and R_{max} : 49.9–52.9% (470 nm), 50.6–54.5% (546 nm), 51.0–54.6% (589 nm), 51.2–54.7% (650 nm)

7.35(27), 4.604(80), 3.354(18), 3.131(100), 2.291(29), 2.146(19), 2.112(18), 1.9377(43)

