

major NON-SILICATE mineral groups

Gold group

$X^{II}M$ (CCP metals [isometric])

Au
Ag
Cu

Platinum group

$X^{II}M$ (CCP metals; compare with the HCP osmium group [isometric])

Pt
Pd
Rh
Ir

Osmium group

$X^{II}M$ (HCP metals; compare with the CCP platinum group [hexagonal])

Os
Ru
Re

Chalcocite group

$III-IV(Cu)_{2-x}S$

$Cu_{2.00}S$
 $Cu_{1.97}S$
 $Cu_{1.80}S$
 $Cu_{1.78}S$
 $Cu_{1.75}S$
 $Cu_{1.60}S$
 $Cu_{1.40}S$

Pentlandite group

$VI(M)^{IV}(M)_8^{IV-V}S_9$ (CCP packing of S atoms with two metal sites [isometric])

$Fe(Fe,Ni)_8S_9$
 $Ag(Fe,Ni)_8S_9$
 $CoCo_8S_9$

Galena group

$VI(M)^{VI}S$ ("NaCl" structure [isometric])

PbS
PbSe
PbTe
MnS
CaS
MnS

Sphalerite group

${}^{\text{IV}}(\text{M})^{\text{IV}}\text{S}$ (modified "diamond" structure: "Zn" and "S" replace C atoms alternately [isometric])

ZnS (multiple polymorphs; one belongs to the sphalerite group)

ZnSe

HgS (multiple polymorphs; one belongs to the sphalerite group)

HgSe

HgTe

CdS (multiple polymorphs; one belongs to the sphalerite group)

Chalcopyrite group

${}^{\text{IV}}(\text{M})^{\text{IV}}(\text{M}')^{\text{IV}}\text{S}_2$ (derivative of the "sphalerite" structure: Cu and "Fe" replace Zn atoms alternately, and Cu and Fe atom positions are interchanged from one half-unit cell to the next along c [tetragonal])

$\text{Cu}^+\text{Fe}^{3+}\text{S}_2$

$\text{Cu}^+\text{Fe}^{3+}\text{Se}_2$

$\text{Cu}^+\text{Ga}^{3+}\text{S}_2$

$\text{Cu}^+\text{In}^{3+}\text{S}_2$

Stannite group minerals are structurally equivalent to the chalcopyrite group

Thiospinel group

${}^{\text{IV}}(\text{M})^{\text{VI}}(\text{M}')_2\text{S}_4$ (equivalent to the oxide spinels [isometric])

$\text{Co}^{2+}\text{Co}^{3+}_2\text{S}_4$

$\text{Cu}^{2+}\text{Co}^{3+}_2\text{S}_4$

$\text{Cu}^{2+}\text{Ni}^{3+}_2\text{S}_4$

$\text{Cu}^{2+}\text{Co}^{3+}_2\text{Se}_4$ (Ni^{3+} may replace Co^{3+})

$\text{Co}^{2+}\text{Co}^{3+}_2\text{Se}_4$

$\text{Ni}^{2+}\text{Co}^{3+}_2\text{S}_4$ (Co^{2+} may replace Ni^{2+} ; Ni^{3+} may replace Co^{3+})

$\text{Ni}^{2+}\text{Ni}^{3+}_2\text{S}_4$

$\text{Ni}^{2+}\text{Ni}^{3+}_2\text{Se}_4$

$\text{Fe}^{2+}\text{Ni}^{3+}_2\text{S}_4$

$\text{Fe}^{2+}\text{Fe}^{3+}_2\text{S}_4$

$\text{Fe}^{2+}\text{Cr}^{3+}_2\text{S}_4$

$\text{Fe}^{2+}\text{In}^{3+}_2\text{S}_4$

$\text{ZnCr}^{3+}_2\text{S}_4$

$\text{Cu}^{2+}\text{Cr}^{3+}_2\text{S}_4$ (Sb^{3+} may replace Cr^{3+})

$\text{Cu}^{2+}\text{Ir}^{3+}_2\text{S}_4$

$\text{Cu}^{2+}\text{Rh}^{3+}_2\text{S}_4$

$\text{Cu}^{2+}[\text{Pt}^{3+}\text{Ir}^{3+}]\text{S}_4$

Pyrite group

${}^{\text{VI}}(\text{M})^{\text{VI}}(\text{X}_2)$ (modified "NaCl" structure [isometric; X-X dimers oriented parallel to the cube diagonals]; note compositional similarity to marcasite group)

FeS_2 (two polymorphs... one belongs to pyrite group)

NiS_2

CoS_2

NiSe_2 (two polymorphs... one belongs to pyrite group)

CoSe_2 (two polymorphs... one belongs to pyrite group)

CuS_2

CuSe_2

MnS_2

RuS_2

AuSb₂
NiAs₂ (two polymorphs... one belongs to pyrite group)
PtAs₂
PtSb₂
PtBi₂
OsS₂
FeSe₂ (two polymorphs... one belongs to pyrite group)
Ir_{1-x}Te₂
IrBiTe

Cobaltite group minerals are structurally-derived from the pyrite group: X-X pairs are made up of two dissimilar atoms (isometric or pseudo-isometric)

Marcasite group

${}^{\text{VI}}(\text{M})^{\text{VI}}(\text{X}_2)$ (note compositional similarity to pyrite group; [orthorhombic; X-X dimers oriented parallel to *a-b* plane])

FeS₂ (two polymorphs... one belongs to marcasite group)
NiSe₂ (two polymorphs... one belongs to marcasite group)
CoSe₂ (two polymorphs... one belongs to marcasite group)
CoTe₂
RuAs₂
NiAs₂ (two polymorphs... one belongs to marcasite group)
FeSe₂ (two polymorphs... one belongs to marcasite group)
FeTe₂
OsAs₂
FeAs₂
FeSb₂
CoAs₂
NiSb₂

Arsenopyrite group minerals are structurally-derived from the marcasite group: X-X pairs are made up of two dissimilar atoms (monoclinic [pseudo-orthorhombic])

Periclase group

${}^{\text{VI}}(\text{M})^{\text{VI}}\text{O}$ ("NaCl" structure [isometric])

MgO
NiO
MnO
CdO
CaO
Fe²⁺O (may be slightly non-stoichiometric due to the exchange $[3\text{Fe}^{2+}] = [2\text{Fe}^{3+} + \square]$)

Corundum-hematite group

${}^{\text{VI}}(\text{M}_2)\text{O}_3$ (oxygen arranged in HCP; ^{VI}M cations populate 2 out of every 3 sites; note similarity to ilmenite group)

Al₂O₃
Fe³⁺₂O₃
Cr³⁺₂O₃
V³⁺₂O₃

Ilmenite group

${}^{\text{VI}}(\text{M})^{\text{VI}}(\text{M})\text{O}_3$ (oxygen arranged in HCP; the two dissimilar ${}^{\text{VI}}\text{M}$ cations populate 2 out of every 3 sites; note similarity to corundum-hematite group)

$(\text{Fe}^{2+}\text{Ti})\text{O}_3$
 $(\text{Mn}^{2+}\text{Ti})\text{O}_3$
 $(\text{MgTi})\text{O}_3$
 $(\text{ZnTi})\text{O}_3$
 $(\text{NaSb}^{5+})\text{O}_3$
 $(\text{Mn}[\text{Sb}^{5+}_{0.5}\text{Fe}^{3+}_{0.5}])\text{O}_3$

Perovskite group

${}^{\text{XII}}(\text{A})^{\text{VI}}(\text{M})^{\text{VI}}\text{O}_3$ (in the idealized perovskite structure, the ${}^{\text{XII}}\text{A}+\text{O}$ atoms are arranged in CCP; possible twisting or buckling of the ${}^{\text{VI}}\text{M}$ octahedra [due to the size of the ${}^{\text{XII}}\text{A}$ cation] results in a lower symmetry in many natural perovskites)

CaTiO_3
 NaNbO_3 (two polymorphs... both belong to the perovskite group)
 $\text{NaCeTi}_2\text{O}_6$
 SrTiO_3
 BaTiO_3
 PbTiO_3
 CaSnO_3
 MgSiO_3 (only a high pressure phase, from ~660 km to ~2700 km in the lower mantle; other polymorphs at shallower depths)

Rutile group

${}^{\text{VI}}(\text{M})^{\text{III}}\text{O}_2$

TiO_2 (three polymorphs... one belongs to the rutile group)
 Mn^{4+}O_2
 Pb^{4+}O_2
 SnO_2
 GeO_2
 SiO_2 (multiple polymorphs... stishovite, *not quartz*, is the member of the rutile group)

Uraninite group

${}^{\text{VIII}}(\text{M})^{\text{IV}}\text{O}_2$ (equivalent to fluorite [isometric])

U^{4+}O_2
 Th^{4+}O_2

Diaspore group

$\alpha\text{-}{}^{\text{VI}}(\text{M})\text{O}(\text{OH})$ (oxygen arranged in HCP)

$\alpha\text{-AlO}(\text{OH})$
 $\alpha\text{-Cr}^{3+}\text{O}(\text{OH})$
 $\alpha\text{-Fe}^{3+}\text{O}(\text{OH})$
 $\alpha\text{-Mn}^{3+}\text{O}(\text{OH})$
 $\alpha\text{-V}^{3+}\text{O}(\text{OH})$
 $\alpha\text{-GaO}(\text{OH})$

Lepidocrocite group minerals $[\gamma\text{-}^{\text{VI}}(\text{M})\text{O}(\text{OH})]$ are chemically similar to the diaspore group but are based on oxygen arranged in CCP

Brucite group

$^{\text{VI}}(\text{M})\text{O}(\text{OH})_2$ (oxygen arranged in HCP; the "brucite" structural unit is an important component of sheet silicates, notably serpentine, talc, biotite, and chlorite)

$\text{Mg}(\text{OH})_2$
 $\text{Fe}^{2+}(\text{OH})_2$
 $\text{Mn}^{2+}(\text{OH})_2$
 $\text{Ca}(\text{OH})_2$
 $\text{Ni}^{2+}(\text{OH})_2$

Gibbsite is related, but like corundum, only 2 of 3 octahedral sites are occupied. Due to stacking mismatch between the layers, gibbsite is monoclinic rather than hexagonal. Like the "brucite" structural unit, the "gibbsite" structural unit is also an important component of sheet silicates, notably in kaolinite, pyrophyllite, muscovite and chlorite.

Spinel group

$^{\text{IV}}(\text{M})^{\text{VI}}(\text{M})_2\text{O}_4$ (oxygen arranged in ~CCP; "normal" spinels are $^{\text{IV}}(\text{M}^{2+})^{\text{VI}}(\text{M}^{3+})_2\text{O}_4$ and "inverse" spinels are $^{\text{IV}}(\text{M}^{3+})^{\text{VI}}(\text{M}^{3+}\text{M}^{2+})\text{O}_4$, determined in part by crystal field effects... some of the more well-known "normal" and "inverse" spinels are identified)

MgAl_2O_4 ("normal")
 $\text{Mn}^{2+}\text{Al}_2\text{O}_4$ ("normal")
 $\text{Fe}^{2+}\text{Al}_2\text{O}_4$ ("normal")
 ZnAl_2O_4 ("normal")
 $\text{MgFe}^{3+}_2\text{O}_4$ ("inverse")
 $\text{Mn}^{2+}\text{Fe}^{3+}_2\text{O}_4$ (two polymorphs... one belongs to the spinel group)
 $\text{Fe}^{2+}\text{Fe}^{3+}_2\text{O}_4$ ("inverse")
 $\text{ZnFe}^{3+}_2\text{O}_4$ ("normal")
 $\text{Ni}^{2+}\text{Fe}^{3+}_2\text{O}_4$ ("inverse")
 $\text{Cu}^{2+}\text{Fe}^{3+}_2\text{O}_4$ ("inverse")
 $\text{Ge}^{2+}\text{Fe}^{3+}_2\text{O}_4$
 $\text{MgCr}^{3+}_2\text{O}_4$ ("normal")
 $\text{Mn}^{2+}\text{Cr}^{3+}_2\text{O}_4$ ("normal")
 $\text{Fe}^{2+}\text{Cr}^{3+}_2\text{O}_4$ ("normal")
 $\text{Ni}^{2+}\text{Cr}^{3+}_2\text{O}_4$ ("normal")
 $\text{Co}^{2+}\text{Cr}^{3+}_2\text{O}_4$
 $\text{ZnCr}^{3+}_2\text{O}_4$ ("normal")
 $\text{MgV}^{3+}_2\text{O}_4$
 $\text{Mn}^{2+}\text{V}^{3+}_2\text{O}_4$
 $\text{Fe}^{2+}\text{V}^{3+}_2\text{O}_4$
 TiMg_2O_4 ("inverse")
 $\text{TiFe}^{2+}_2\text{O}_4$ ("inverse")
 $\text{Fe}^{3+}(\text{Fe}^{3+}_{1.67}\square_{0.33})\text{O}_4$ ("inverse"; note compositional similarity to hematite)
 SiMg_2O_4 (only a high pressure phase, from ~520 km to ~660 km in the lower mantle; other polymorphs at shallower and deeper depths; note compositional similarity to olivine)

Calcite group

$^{\text{VI}}(\text{M})\text{CO}_3$ (note similarity to aragonite group)

CaCO_3 (three polymorphs... one in the calcite group)
 MgCO_3
 $\text{Fe}^{2+}\text{CO}_3$
 $\text{Mn}^{2+}\text{CO}_3$
 ZnCO_3

CdCO₃
Co²⁺CO₃
Ni²⁺CO₃

Aragonite group

^X(M)CO₃ (note similarity to calcite group)

CaCO₃ (three polymorphs... one in the aragonite group)

SrCO₃
BaCO₃
PbCO₃

Dolomite group

^{VI}(M)^{VI}(M)(CO₃)₂ (note similarity to calcite group)

CaMg(CO₃)₂
CaFe²⁺(CO₃)₂
CaMn²⁺(CO₃)₂
CaZn(CO₃)₂

Barite group

^{XII}(M)^{IV}TO₄ (where ^{VI}T is typically S⁶⁺)

BaSO₄
SrSO₄
PbSO₄
BaCr⁶⁺O₄
Pb₂(SO₄)(SeO₄)
Pb₃(SO₄)₂[GeO₂(OH)₂]
KBF₄ (significant K may be replaced by Cs)

CaSO₄ (compositionally similar but structurally distinct from the barite group)

Alunite-jarosite group

^{VI}(M)^{VI}(M)₃(^{IV}TO₄)₂(OH)₆ (where ^{VI}T is typically S⁶⁺ or P⁵⁺; when a 5+ ion occupies ^{IV}T, OH may be replaced by H₂O)

KAl₃(SO₄)₂(OH)₆
(NH₄)Al₃(SO₄)₂(OH)₆
(Ca_{0.5}□_{0.5})Al₃(SO₄)₂(OH)₆
(Na_{0.33}Ca_{0.33}□_{0.33})Al₃(SO₄)₂(OH)₆
NaAl₃(SO₄)₂(OH)₆
Pb²⁺(Cu²⁺Al₂)(SO₄)₂(OH)₆
(H₃O⁺_{0.33}Ca_{0.67})Al₃[(SO₄)_{1.33}(AsO₄)_{0.67}](OH)₆
(Ba_{0.5}□_{0.5})Al₃(SO₄)₂(OH)₆
PbAl₃(AsO₄)₂[(OH)₅(H₂O)]
PbAl₃(PO₄)₂[(OH)₅(H₂O)]
SrAl₃(AsO₄)₂[(OH)₅(H₂O)]
SrAl₃(PO₄)₂[(OH)₅(H₂O)]
CaAl₃(PO₄)₂[(OH)₅(H₂O)]
CaAl₃(AsO₄)₂[(OH)₅(H₂O)]
BaAl₃(AsO₄)₂[(OH)₅(H₂O)]
SrAl₃(AsO₄)₂[(OH)₅(H₂O)]
(H₃O⁺_{0.5}Th_{0.5})Al₃[(PO₄)_{1.33}(SiO₄)_{0.67}][(OH)_{4.83}(H₂O)_{1.27}]
BaAl₃(PO₄)₂[(OH)₅(H₂O)]

$\text{PbAl}_3[(\text{PO}_4)(\text{SO}_4)](\text{OH})_6$
 (LREE) $\text{Al}_3(\text{PO}_4)_2(\text{OH})_6$ (several species where the dominant LREE differs are known)
 (LREE) $\text{Al}_3(\text{AsO}_4)_2(\text{OH})_6$ (several species where the dominant LREE differs are known)
 $\text{Bi}^{3+}\text{Al}_3(\text{PO}_4)_2(\text{OH})_6$
 $\text{KFe}^{3+}_3(\text{SO}_4)_2(\text{OH})_6$
 $(\text{NH}_4)\text{Fe}^{3+}_3(\text{SO}_4)_2(\text{OH})_6$
 $\text{NaFe}^{3+}_3(\text{SO}_4)_2(\text{OH})_6$
 $(\text{H}_3\text{O}^+)\text{Fe}^{3+}_3(\text{SO}_4)_2(\text{OH})_6$
 $\text{Ti}^+\text{Fe}^{3+}_3(\text{SO}_4)_2(\text{OH})_6$
 $\text{AgFe}^{3+}_3(\text{SO}_4)_2(\text{OH})_6$
 $\text{Pb}^{2+}(\text{Cu}^{2+}\text{Fe}^{3+}_2)(\text{SO}_4)_2(\text{OH})_6$
 $(\text{Pb}_{0.5}\square_{0.5})\text{Fe}^{3+}_3(\text{SO}_4)_2(\text{OH})_6$
 $\text{PbFe}^{3+}_3(\text{AsO}_4)_2[(\text{OH})_5(\text{H}_2\text{O})]$
 $\text{PbFe}^{3+}_3(\text{PO}_4)_2[(\text{OH})_5(\text{H}_2\text{O})]$
 $\text{PbGa}_3[(\text{AsO}_4)(\text{SO}_4)](\text{OH})_6$
 (LREE) $\text{Fe}^{3+}_3(\text{AsO}_4)_2(\text{OH})_6$ (currently only the Ce^{3+} species is recognized)
 $\text{SrFe}^{3+}_3(\text{PO}_4)_2[(\text{OH})_5(\text{H}_2\text{O})]$
 $\text{BaFe}^{3+}_3(\text{AsO}_4)_2[(\text{OH})_5(\text{H}_2\text{O})]$
 $\text{BaV}^{3+}_3(\text{PO}_4)_2[(\text{OH})_5(\text{H}_2\text{O})]$
 $\text{Bi}^{3+}\text{Fe}^{3+}_3(\text{PO}_4)_2[(\text{OH})_5(\text{H}_2\text{O})]$
 + additional combinations

Monazite group

$^{\text{IX}}(\text{M})^{\text{IV}}\text{TO}_4$ (where $^{\text{VI}}\text{T}$ is typically P^{5+})

$(\text{LREE}^{3+})\text{PO}_4$ (currently only the La^{3+} , Ce^{3+} , Nd^{3+} and Sm^{3+} species are recognized)

$(\text{Ca}_{0.5}\text{Th}^{4+}_{0.5})\text{PO}_4$ (U^{4+} may replace some Th^{4+})

$(\text{LREE}^{3+})\text{AsO}_4$ (currently only the Ce^{3+} species is recognized)

$\text{Th}^{4+}[\text{SiO}_4]$ (two polymorphs... one belongs to monazite group; one belongs to zircon group)

$\text{Bi}^{3+}\text{AsO}_4$

The following six minerals are chemically similar to but structurally distinct from the monazite group; they belong to the zircon group

Y^{3+}PO_4 (HREE $^{3+}$ may replace Y)

$\text{Yb}^{3+}\text{PO}_4$ (other HREE $^{3+}$ may replace Yb)

$\text{Y}^{3+}\text{AsO}_4$ (HREE $^{3+}$ may replace Y)

Y^{3+}VO_4 (HREE $^{3+}$ may replace Y)

$\text{Ce}^{3+}\text{VO}_4$ (other LREE $^{3+}$ may replace Ce)

$\text{Bi}^{3+}\text{VO}_4$

Apatite group

$^{\text{VI}}(\text{M})_3^{\text{VI}}(\text{M})_2(^{\text{IV}}\text{TO}_4)_3\text{X}$ (hexagonal unless otherwise noted; minor Mn^{2+} may replace Ca; limited SiO_4^{4-} , SO_4^{2-} , CO_3^{2-} , may replace PO_4^{3-})

$\text{Ca}_3\text{Ca}_2(\text{PO}_4)_3\text{F}$

$\text{Ca}_3\text{Ca}_2(\text{PO}_4)_3\text{Cl}$

$\text{Ca}_3\text{Ca}_2(\text{PO}_4)_3\text{OH}$ (both hexagonal and monoclinic structures are known)

$\text{Ba}_3\text{Ba}_2(\text{PO}_4)_3\text{Cl}$

$\text{Sr}_3\text{Ca}_2(\text{PO}_4)_3\text{OH}$

$\text{Sr}_3(\text{Na}[\text{LREE}^{3+}])(\text{PO}_4)_3\text{F}$ (currently only the La^{3+} and Ce^{3+} species are recognized; both are trigonal)

$\text{Pb}_3\text{Pb}_2(\text{AsO}_4)_3\text{Cl}$ (both hexagonal and monoclinic structures are known)

$\text{NaCa}_2[\text{LREE}^{3+}]\text{Sr}(\text{PO}_4)_3\text{F}$ (currently only the Ce^{3+} species is recognized; trigonal)

$\text{Sr}_3\text{Ca}_2(\text{AsO}_4)_3\text{OH}$ (monoclinic)

$\text{Pb}_3\text{Ca}_2(\text{PO}_4)_3\text{F}$

$\text{Ca}_3\text{Ca}_2(\text{AsO}_4)_3\text{OH}$

$\text{Ba}_3(\text{Na}[\text{LREE}^{3+}])(\text{PO}_4)_3(\text{F}_{0.5}\text{Cl}_{0.5})$ (currently only the Ce^{3+} species is recognized; trigonal)

$\text{Ba}_3\text{Ba}_2(\text{AsO}_4)_3\text{Cl}$

$\text{Pb}_3\text{Pb}_2(\text{PO}_4)_3\text{Cl}$

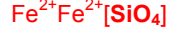
Ca₃Ca₂(AsO₄)₃F
Ca₃Ca₂(AsO₄)₃Cl
Pb₃Pb₂(VO₄)₃Cl

major SILICATE mineral groups

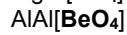
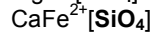
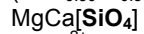
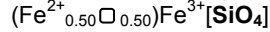
Olivine group



MgMg[SiO₄] (Mg₂[SiO₄] also occurs as important high pressure polymorphs in the lower mantle)



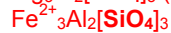
MnMn[SiO₄] (Zn may replace Mn in M1)



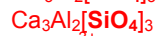
Garnet group



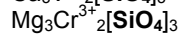
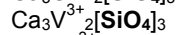
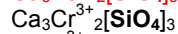
Mg₃Al₂[SiO₄]₃ (Na may replace Mg; P⁵⁺ may replace Si)



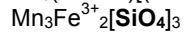
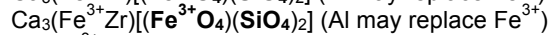
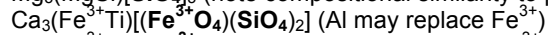
Mn₃Al₂[SiO₄]₃ (Y may replace Mn; (□F₄)⁴⁻ may replace (SiO₄)⁴⁻)



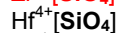
Ca₃Fe₂[SiO₄]₃ (Sn⁴⁺ may replace Fe³⁺)



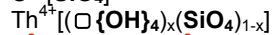
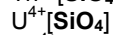
Mg₃(MgSi)[SiO₄]₃ (note compositional similarity to pyroxene)



Zircon group



Th⁴⁺[SiO₄] (two polymorphs... one belongs to zircon group; one belongs to monazite group)



Y³⁺[PO₄] (HREE³⁺ may replace Y)

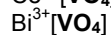
Yb³⁺[PO₄] (other HREE³⁺ may replace Yb)

Ta⁵⁺[BO₄] (Nb⁵⁺ may replace Ta)

Y³⁺[AsO₄] (HREE³⁺ may replace Y)

Y³⁺[VO₄] (HREE³⁺ may replace Y)

Ce³⁺[VO₄] (LREE³⁺ may replace Ce)



Andalusite group (the "aluminum silicates")

${}^{\text{VI}}(\text{Al})^{\text{IV,V,or VI}}(\text{Al})\text{O}[\text{TO}_4]$ (Mn^{3+} , Fe^{3+} , minor Ti^{4+} , Fe^{2+} , less commonly Cr^{3+} may replace ${}^{\text{VI}}\text{Al}$; minor P^{5+} may replace Si^{4+})



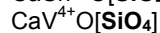
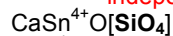
$({}^{\text{VI}}\text{Al}^{\text{VI}}\text{AlO}[\text{SiO}_4])_4 \cdot {}^{\text{VI}}\text{Al}^{\text{IV}}\text{Fe}^{2+}_2\text{O}_4\text{H}$ (structurally related to the aluminosilicates [notice the "kyanite" layer]... little substitution occurs in this layer; Mg, minor Li, may replace ${}^{\text{VI}}\text{Al}$ in the ${}^{\text{VI}}\text{Al}^{\text{IV}}\text{Fe}^{2+}_2\text{O}_4\text{H}$ layer; Al, minor Co^{2+} , Zn, may replace ${}^{\text{IV}}\text{Fe}^{2+}$; additional H may be present)

${}^{\text{VI}}\text{Al}^{\text{VI}}\text{AlF}_2[\text{SiO}_4]$ (structurally related to the aluminosilicates; significant OH may replace F; minor Cr^{3+} , Mn^{3+} , Fe^{3+} , may replace Al; very minor Ga may replace Al)

Titanite group

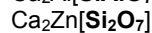
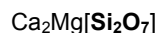


$\text{CaTiO}[\text{SiO}_4]$ (Na and REE^{3+} [primarily LREE and MREE], as well as small amounts of U^{4+} , Th^{4+} , may replace Ca; substantial Al, Fe^{3+} , as well as minor Nb^{5+} , Zr^{4+} , Ta^{5+} , may replace Ti; substantial F, OH, may replace the independent O)



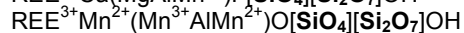
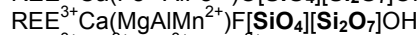
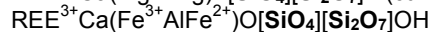
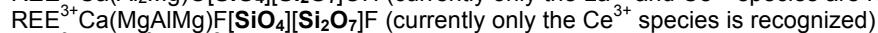
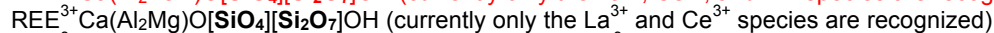
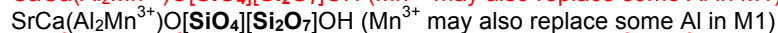
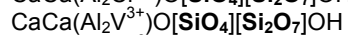
Melilite group

${}^{\text{VIII}}(\text{M})^{\text{IV}}(\text{T})[\text{T}_2\text{O}_7]$ (Na extensively replaces Ca in ${}^{\text{VIII}}\text{M}$)



Epidote group

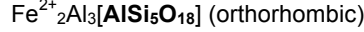
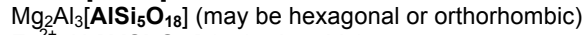
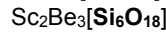
${}^{\text{IX-X}}(\text{A}_2) {}^{\text{VIII-IX}}(\text{A}_1) {}^{\text{VI}}[\text{M}_1\text{M}_2\text{M}_3]\text{O}[\text{TO}_4][\text{T}_2\text{O}_7]\text{OH}$



+ additional combinations

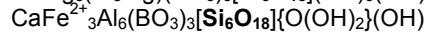
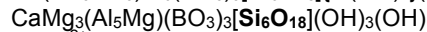
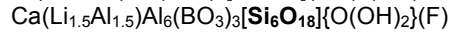
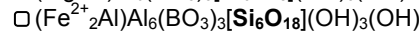
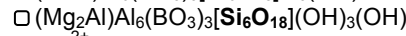
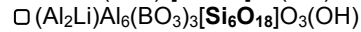
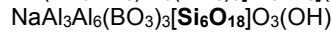
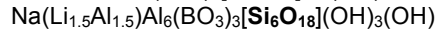
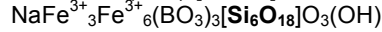
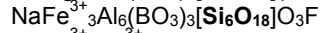
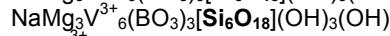
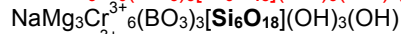
Beryl-cordierite group

${}^{\text{VI}}(\text{M})_2{}^{\text{IV}}(\text{T})_3[\text{T}_6\text{O}_{18}]$ (Cr^{3+} , V^{3+} , Mn^{3+} , Fe^{3+} may replace Al in ${}^{\text{VI}}\text{M}$; alkali metals, H_2O , CO_2 , may occur in channels)



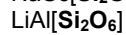
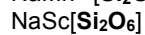
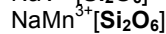
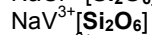
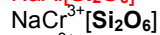
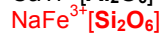
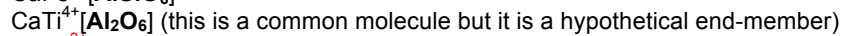
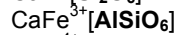
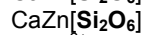
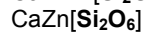
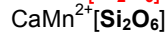
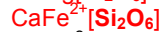
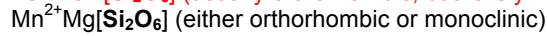
Tourmaline group

$\text{channel}({}^{\text{VI}}\text{X})_1({}^{\text{VI}}\text{Y})_3({}^{\text{VI}}\text{Z})_6[{}^{\text{III}}\text{BO}_3]_3[\text{T}_6\text{O}_{18}](\text{OH})_3(\text{OH})$ (O may replace one or more of the three structurally similar OH groups; F, rarely Cl, may replace the lone OH; small amounts of Al, B, may replace Si)



Pyroxene group

${}^{\text{VI-VIII}}(\text{M}_2){}^{\text{VI}}(\text{M}_1)[\text{T}_2\text{O}_6]$ (monoclinic unless otherwise noted)



$\text{Ca}_2[\text{Si}_2\text{O}_6]$ (related to pyroxene group; usually triclinic, but sometimes monoclinic; contains ${}^{\text{VI}}\text{M}_1$, ${}^{\text{VI}}\text{M}_2$, and ${}^{\text{VII}}\text{M}_3$ sites)

$\text{Ca}(\text{Mn}^{2+})[\text{Si}_2\text{O}_6]$ (related to pyroxene group; triclinic; contains ${}^{\text{VI}}\text{M}_1$, ${}^{\text{VI}}\text{M}_2$, ${}^{\text{VI}}\text{M}_3$ and ${}^{\text{VIII}}\text{M}_4$ sites; Fe^{2+} , Mg, minor Zn, may replace Mn)

$\text{Mn}^{2+}_2[\text{Si}_2\text{O}_6]$ (related to pyroxene group; triclinic; contains ${}^{\text{VI}}\text{M}_1$, ${}^{\text{VI}}\text{M}_2$, ${}^{\text{VI}}\text{M}_3$, ${}^{\text{VI-VIII}}\text{M}_4$ and ${}^{\text{VI-VIII}}\text{M}_5$ sites; Ca, Fe^{2+} , Mg, minor Zn, may replace Mn)

Amphibole group

$X^{II}(A)^{VIII}(M4)_2^VI(M1,M2,M3)_5[T_8O_{22}](OH)_2$ (monoclinic unless otherwise noted; K, Ca, minor Ba, minor Pb, may replace Na in $X^{II}A$; Fe^{3+} may replace Al in ^{VI}M , or more rarely Si in ^{IV}T ; Ti may replace Fe-Mg in ^{VI}M , or more rarely Si in ^{IV}T ; F, less commonly Cl, O, may replace OH)

□ $Mg_2Mg_5[Si_8O_{22}](OH)_2$ (either orthorhombic or monoclinic)

□ $Fe^{2+}_2Fe^{2+}_5[Si_8O_{22}](OH)_2$ (either orthorhombic or monoclinic)

Na $Fe^{2+}_2Fe^{2+}_5[AlSi_7O_{22}](OH)_2$ (orthorhombic)

Na $Fe^{2+}_2(Fe^{2+}_4Al)[Al_2Si_6O_{22}](OH)_2$ (orthorhombic)

Na $Mg_2Mg_5[AlSi_7O_{22}](OH)_2$ (orthorhombic)

Na $Mg_2(Mg_4Al)[Al_2Si_6O_{22}](OH)_2$ (orthorhombic)

□ $Mn^{2+}_2Mg_5[Si_8O_{22}](OH)_2$

□ $Mn^{2+}_2Fe^{2+}_5[Si_8O_{22}](OH)_2$

□ $Mn^{2+}_2(Mg_3Mn^{2+}_2)[Si_8O_{22}](OH)_2$

+ additional combinations in the Mg- Fe^{2+} - Mn^{2+} subgroup

□ $Li_2(Fe^{2+}_3Fe^{3+}_2)[Si_8O_{22}](OH)_2$ (either orthorhombic or monoclinic)

□ $Li_2(Mg_3Fe^{3+}_2)[Si_8O_{22}](OH)_2$ (either orthorhombic or monoclinic)

□ $Li_2(LiMg_2Al_2)[AlSi_7O_{22}](OH)_2$

Na $Li_2(LiMg_2Al_2)[Si_8O_{22}]F_2$

Na $Li_2(LiFe^{2+}_2Fe^{3+}_2)[Si_8O_{22}](OH)_2$

Na $Li_2(LiFe^{2+}_2Fe^{3+}_2)[Si_8O_{22}](OH)_2$

+ additional combinations in the Li subgroup

□ $Ca_2Mg_5[Si_8O_{22}](OH)_2$

□ $Ca_2Fe^{2+}_5[Si_8O_{22}](OH)_2$

□ $Ca_2(Mg_4Al)[AlSi_7O_{22}](OH)_2$

□ $Ca_2(Fe^{2+}_4Al)[AlSi_7O_{22}](OH)_2$

□ $Ca_2(Mg_3Al_2)[Al_2Si_6O_{22}](OH)_2$

□ $Ca_2(Fe^{2+}_3Al_2)[Al_2Si_6O_{22}](OH)_2$

Na $Ca_2Mg_5[AlSi_7O_{22}](OH)_2$

Na $Ca_2Fe^{2+}_5[AlSi_7O_{22}](OH)_2$

Na $Ca_2(Mg_4Al)[Si_8O_{22}](OH)_2$

Na $Ca_2(Fe^{2+}_4Al)[Si_8O_{22}](OH)_2$

Na $Ca_2(Mg_4Al)[Al_2Si_6O_{22}](OH)_2$

Na $Ca_2(Fe^{2+}_4Al)[Al_2Si_6O_{22}](OH)_2$

Na $Ca_2(Mg_3Al_2)[Al_3Si_5O_{22}](OH)_2$

Na $Ca_2(Fe^{2+}_3Al_2)[Al_3Si_5O_{22}](OH)_2$

Ca $Ca_2(Mg_4Al)[Al_3Si_5O_{22}]F_2$

K $Ca_2(Fe^{2+}_4Fe^{3+})[Al_2Si_6O_{22}]Cl_2$

+ additional combinations in the Ca-Ca subgroup

□ (NaCa)(Mg_4Al)[Si_8O_{22}](OH)₂

□ (NaCa)(Fe^{2+}_4Al)[Si_8O_{22}](OH)₂

□ (NaCa)(Mg_3Al_2)[$AlSi_7O_{22}$](OH)₂

□ (NaCa)($Fe^{2+}_3Al_2$)[$AlSi_7O_{22}$](OH)₂

□ (NaCa)($Mg_3Fe^{3+}_2$)[$AlSi_7O_{22}$](OH)₂

Na(NaCa) $Mg_5[Si_8O_{22}](OH)_2$

Na(NaCa) $Fe^{2+}_5[Si_8O_{22}](OH)_2$

Na(NaCa)(Mg_4Al)[$AlSi_7O_{22}$](OH)₂

Na(NaCa)(Fe^{2+}_4Al)[$AlSi_7O_{22}$](OH)₂

Na(NaCa)(Mg_3Al_2)[$Al_2Si_6O_{22}$](OH)₂

Na(NaCa)($Fe^{2+}_3Al_2$)[$Al_2Si_6O_{22}$](OH)₂

Na(NaCa) $Mg_5[Si_8O_{22}]F_2$

K(NaCa) $Mg_5[Si_8O_{22}](OH)_2$

+ additional combinations in the Na-Ca subgroup

□ $Na_2(Mg_3Al_2)[Si_8O_{22}](OH)_2$

□ $Na_2(Fe^{2+}_3Al_2)[Si_8O_{22}](OH)_2$

□ $Na_2(Mg_3Fe^{3+}_2)[Si_8O_{22}](OH)_2$

$\square \text{Na}_2(\text{Fe}^{2+}_3\text{Fe}^{3+}_2)[\text{Si}_8\text{O}_{22}](\text{OH})_2$
 $\text{NaNa}_2(\text{Mg}_3\text{Al}_2)[\text{AlSi}_7\text{O}_{22}](\text{OH})_2$
 $\text{NaNa}_2(\text{Fe}^{2+}_3\text{Al}_2)[\text{AlSi}_7\text{O}_{22}](\text{OH})_2$
 $\text{NaNa}_2(\text{Mg}_3\text{Fe}^{3+}_2)[\text{AlSi}_7\text{O}_{22}](\text{OH})_2$
 $\text{NaNa}_2(\text{Fe}^{2+}_3\text{Fe}^{3+}_2)[\text{AlSi}_7\text{O}_{22}](\text{OH})_2$
 $\text{NaNa}_2(\text{Mg}_4\text{Al})[\text{Si}_8\text{O}_{22}](\text{OH})_2$
 $\text{NaNa}_2(\text{Fe}^{2+}_4\text{Al})[\text{Si}_8\text{O}_{22}](\text{OH})_2$
 $\text{NaNa}_2(\text{Mn}^{2+}_4\text{Al})[\text{Si}_8\text{O}_{22}](\text{OH})_2$
 $\text{NaNa}_2(\text{Mg}_2\text{Fe}^{3+}_2\text{Li})[\text{Si}_8\text{O}_{22}](\text{OH})_2$
 $\text{KNa}_2(\text{Mg}_4\text{Fe}^{3+})[\text{Si}_8\text{O}_{22}]\text{F}_2$
 $\text{NaNa}_2(\text{MgMn}^{3+}_2\text{LiTi})[\text{AlSi}_7\text{O}_{22}](\text{OH})_2$
 + additional combinations in the Na-Na subgroup

$\square (\text{NaLi})(\text{Mg}_3\text{Fe}^{3+}_2)[\text{Si}_8\text{O}_{22}](\text{OH})_2$
 $\square (\text{NaLi})(\text{Fe}^{2+}_3\text{Fe}^{3+}\text{Al})[\text{Si}_8\text{O}_{22}](\text{OH})_2$
 $\square (\text{NaLi})(\text{Mg}_3\text{Fe}^{3+}\text{Al})[\text{Si}_8\text{O}_{22}](\text{OH})_2$
 $\text{Na}(\text{NaLi})(\text{Mg}_2\text{Fe}^{3+}\text{AlLi})[\text{Si}_8\text{O}_{22}](\text{OH})_2$
 $\text{Na}(\text{NaLi})(\text{Fe}^{2+}_2\text{Fe}^{3+}\text{AlLi})[\text{Si}_8\text{O}_{22}](\text{OH})_2$
 $\text{Na}(\text{NaLi})(\text{Mg}_2\text{Fe}^{3+}_2\text{Li})[\text{Si}_8\text{O}_{22}](\text{OH})_2$
 + other hypothetical combinations in the Na-Li subgroup are possible

$\text{NaNa}_2(\text{Mg}_3\text{Fe}^{3+}\text{Ti})[\text{Si}_8\text{O}_{22}]\text{O}_2$
 $\text{NaNa}_2(\text{Mn}^{2+}_2\text{Mn}^{3+}_3)[\text{AlSi}_7\text{O}_{22}]\text{O}_2$
 $\text{NaCa}_2(\text{Mg}_3\text{TiAl})[\text{Al}_2\text{Si}_6\text{O}_{22}]\text{O}_2$
 + additional combinations in the oxo subgroup

Kaolinite-serpentine group

${}^{\text{VI}}(\text{M})_6[\text{T}_4\text{O}_{10}](\text{OH})_8$ (notice compositional similarity to chlorite group)

$(\text{Al}_4\square)_2[\text{Si}_4\text{O}_{10}](\text{OH})_8$ (multiple polymorphs and polytypes; monoclinic or triclinic; halloysite-10Å additionally has 2 molecules of structural H₂O)

$\text{Mg}_6[\text{Si}_4\text{O}_{10}](\text{OH})_8$ (multiple polymorphs and polytypes; monoclinic, hexagonal, orthorhombic)

$\text{Fe}^{2+}_6[\text{Si}_4\text{O}_{10}](\text{OH})_8$
 $\text{Ni}^{2+}_6[\text{Si}_4\text{O}_{10}](\text{OH})_8$ (multiple polymorphs; monoclinic or trigonal)
 $(\text{Mg}_4\text{Al}_2)[\text{Al}_2\text{Si}_2\text{O}_{10}](\text{OH})_8$
 $(\text{Fe}^{2+}_4\text{Al}_2)[\text{Al}_2\text{Si}_2\text{O}_{10}](\text{OH})_8$
 $(\text{Ni}^{2+}_4\text{Al}_2)[\text{Al}_2\text{Si}_2\text{O}_{10}](\text{OH})_8$
 $(\text{Mn}^{2+}_4\text{Al}_2)[\text{Al}_2\text{Si}_2\text{O}_{10}](\text{OH})_8$
 $(\text{Zn}_4\text{Al}_2)[\text{Al}_2\text{Si}_2\text{O}_{10}](\text{OH})_8$ (some Ca may replace Zn)
 $(\text{Fe}^{2+}_4\text{Fe}^{3+}_2)[\text{Fe}^{3+}_2\text{Si}_2\text{O}_{10}](\text{OH})_8$
 $(\text{Al}_4\text{Li}_2)[\text{AlBSi}_2\text{O}_{10}](\text{OH})_8$

Pyrophyllite-talc group

${}^{\text{VI}}(\text{M})_3[\text{T}_4\text{O}_{10}](\text{OH})_2$

$(\text{Al}_2\square)[\text{Si}_4\text{O}_{10}](\text{OH})_2$ (multiple polytypes; monoclinic or triclinic)

$\text{Mg}_3[\text{Si}_4\text{O}_{10}](\text{OH})_2$
 $\text{Fe}^{2+}_3[\text{Si}_4\text{O}_{10}](\text{OH})_2$
 $\text{Ni}^{2+}_3[\text{Si}_4\text{O}_{10}](\text{OH})_2$
 $(\text{Fe}^{3+}_2\square)[\text{Si}_4\text{O}_{10}](\text{OH})_2$

Mica group

${}^{\text{XII}}(\text{A}){}^{\text{VI}}[\text{M}_2\text{M}_1][\text{T}_4\text{O}_{10}](\text{OH})_2$

$\text{K}(\text{Al}_2\square)[\text{AlSi}_3\text{O}_{10}](\text{OH})_2$ (multiple polytypes; monoclinic or trigonal)
 $\text{Na}(\text{Al}_2\square)[\text{AlSi}_3\text{O}_{10}](\text{OH})_2$ (multiple polytypes; monoclinic or trigonal)

$\{\text{Ba}_{0.5}(\text{Na},\text{K})_{0.5}\}(\text{Al}_2\text{O})[\text{Al}_{1.5}\text{Si}_{2.5}\text{O}_{10}](\text{OH})_2$
 $\text{K}(\text{V}_2\text{O})[\text{AlSi}_3\text{O}_{10}](\text{OH})_2$
 $\text{K}(\text{Fe}^{3+}\text{MgO})[\text{Si}_4\text{O}_{10}](\text{OH})_2$
 $\text{K}(\text{AlMgO})[\text{Si}_4\text{O}_{10}](\text{OH})_2$
 $\text{K}(\text{Cr}^{3+}\text{MgO})[\text{Si}_4\text{O}_{10}](\text{OH})_2$
 $(\text{NH}_4)(\text{Al}_2\text{O})[\text{AlSi}_3\text{O}_{10}](\text{OH})_2$
 $\text{Cs}(\text{Al}_2\text{O})[\text{AlSi}_3\text{O}_{10}](\text{OH})_2$
 $\text{K}(\text{Al}_2\text{O})[\text{BSi}_3\text{O}_{10}]\text{F}_2$ (multiple polytypes; monoclinic)
 $\text{Ba}(\text{V}_2\text{O})[\text{Al}_2\text{Si}_2\text{O}_{10}](\text{OH})_2$
 $\text{Ca}(\text{Al}_2\text{O})[\text{Al}_2\text{Si}_2\text{O}_{10}](\text{OH})_2$
 + additional dioctahedral micas

$\text{K}(\text{Mg}_3)[\text{AlSi}_3\text{O}_{10}](\text{OH})_2$ (multiple polytypes; monoclinic or trigonal)

$\text{K}(\text{Fe}^{2+}_3)[\text{AlSi}_3\text{O}_{10}](\text{OH})_2$

$\text{K}(\text{Mg}_2\text{Al})[\text{Al}_2\text{Si}_2\text{O}_{10}](\text{OH})_2$

$\text{K}(\text{Fe}^{2+}_2\text{Al})[\text{Al}_2\text{Si}_2\text{O}_{10}](\text{OH})_2$

$\text{Na}(\text{Al}_2\text{Li})[\text{Al}_2\text{Si}_2\text{O}_{10}](\text{OH})_2$ (multiple polytypes; monoclinic)

$\text{K}(\text{Mg}_3)[\text{AlSi}_3\text{O}_{10}]\text{F}_2$

$\text{K}(\text{Fe}^{2+}_3)[\text{AlSi}_3\text{O}_{10}]\text{F}_2$

$\text{K}(\text{Mn}^{2+}_3)[\text{AlSi}_3\text{O}_{10}](\text{OH})_2$

$\text{K}(\text{Zn}_3)[\text{AlSi}_3\text{O}_{10}](\text{OH})_2$

$\text{K}(\text{LiAlMn}^{2+})[\text{AlSi}_3\text{O}_{10}]\text{F}_2$ (multiple polytypes; monoclinic)

$\text{K}(\text{Mn}^{3+}_2\text{Li})[\text{Si}_4\text{O}_{10}]\text{O}_2$

$\text{Na}(\text{Mg}_2\text{Al})[\text{Al}_2\text{Si}_2\text{O}_{10}](\text{OH})_2$ (multiple polytypes; monoclinic)

$\text{Cs}(\text{Li}_2\text{Al})[\text{Si}_4\text{O}_{10}]\text{F}_2$

$\text{K}(\text{Mg}_2\text{Li})[\text{Si}_4\text{O}_{10}]\text{F}_2$ (multiple polytypes; monoclinic)

$\text{K}(\text{Fe}^{2+}_3)[\text{Fe}^{3+}\text{Si}_3\text{O}_{10}](\text{OH})_2$

$\text{K}(\text{Mg}_3)[\text{Fe}^{3+}\text{Si}_3\text{O}_{10}](\text{OH})_2$

$\text{K}(\text{Li}_2\text{Al})[\text{Si}_4\text{O}_{10}]\text{F}_2$

$\text{K}(\text{Li}_{1.5}\text{Al}_{1.5})[\text{AlSi}_3\text{O}_{10}]\text{F}_2$ (multiple polytypes; monoclinic or trigonal)

$\text{Ba}(\text{Fe}^{2+}_3)[\text{Fe}^{3+}\text{Si}_3\text{O}_{10}]\text{S}(\text{OH})$

$\text{Ca}(\text{Al}_2\text{Li})[\text{BeAlSi}_2\text{O}_{10}](\text{OH})_2$

$\text{Ca}(\text{Mg}_2\text{Al})[\text{Al}_3\text{SiO}_{10}](\text{OH})_2$

$\text{Ba}(\text{Fe}^{2+}_3)[\text{Al}_2\text{Si}_2\text{O}_{10}](\text{OH})_2$

$\text{Ba}(\text{Mg}_3)[\text{Al}_2\text{Si}_2\text{O}_{10}](\text{OH})_2$

$\text{Ba}(\text{Mg}_2\text{Ti})[\text{Al}_2\text{Si}_2\text{O}_{10}]\text{O}_2$

+ additional trioctahedral micas

Chlorite group

${}^{\text{VI}}(\text{M})_3{}^{\text{VI}}(\text{M})_3[\text{T}_4\text{O}_{10}](\text{OH})_8$ (notice compositional similarity to kaolinite-serpentine group; various polytypes are possible)

$(\text{Al}_2\text{O})(\text{Al}_{2.33}\text{O}_{0.67})[\text{AlSi}_3\text{O}_{10}](\text{OH})_8$

$(\text{Al}_2\text{O})(\text{Al}_2\text{Li})[\text{AlSi}_3\text{O}_{10}](\text{OH})_8$

$(\text{Al}_2\text{O})(\text{Mg}_2\text{Al})[\text{AlSi}_3\text{O}_{10}](\text{OH})_8$

$(\text{Mg}_3)(\text{Mg}_2\text{Al})[\text{AlSi}_3\text{O}_{10}](\text{OH})_8$

$(\text{Mg}_3)(\text{Ni}^{2+}_2\text{Al})[\text{AlSi}_3\text{O}_{10}](\text{OH})_8$ (Ni^{2+} may also replace some Mg)

$(\text{Zn}_3)(\text{Fe}^{2+}_2\text{Al})[\text{AlSi}_3\text{O}_{10}](\text{OH})_8$

$(\text{Fe}^{2+}_3)(\text{Fe}^{2+}_2\text{Al})[\text{AlSi}_3\text{O}_{10}](\text{OH})_8$

$(\text{Mn}^{2+}_3)(\text{Mn}^{2+}_2\text{Al})[\text{AlSi}_3\text{O}_{10}](\text{OH})_8$

Feldspar group

${}^{\text{cage}}\text{A}[\text{T}_4\text{O}_8]$ (in addition to the ions noted below, minor Pb, very minor Cs, may replace K, Na, Ca, Ba; minor P^{5+} may replace Si; triclinic unless otherwise noted)

$\text{K}[\text{AlSi}_3\text{O}_8]$ (monoclinic and triclinic polymorphs)

$\text{Na}[\text{AlSi}_3\text{O}_8]$ (monoclinic and triclinic polymorphs)

$\text{Rb}[\text{AlSi}_3\text{O}_8]$

$\text{K}[\text{Fe}^{3+}\text{Si}_3\text{O}_8]$ (a moderately common molecule although hypothetical end-member)

$(\text{NH}_4)[\text{AlSi}_3\text{O}_8]$ (monoclinic)
 $\text{Na}[\text{BSi}_3\text{O}_8]$
 $\text{Ca}[\text{Al}_2\text{Si}_2\text{O}_8]$ (hexagonal, orthorhombic and triclinic polymorphs)
 $\text{Ba}[\text{Al}_2\text{Si}_2\text{O}_8]$ (several monoclinic polymorphs)
 $\text{Sr}[\text{Al}_2\text{Si}_2\text{O}_8]$ (monoclinic)
 $\text{Sr}_{0.5}\text{Na}[\text{Al}_2\text{Si}_2\text{O}_8]$ (monoclinic)
 $\text{Ba}_{0.5}\text{Na}[\text{Al}_2\text{Si}_2\text{O}_8]$ (orthorhombic)
 $\text{K}[\text{Al}_{1.5}\text{Zn}_{0.5}\text{Si}_{0.5}\text{As}^{5+}_{1.5}\text{O}_8]$ (monoclinic)

Sodalite group

$^{\text{cage}}\text{A}_8[\text{T}_{12}\text{O}_{24}]^{\text{cage}}\text{X}_2$ (note similarity to scapolite group; K may replace Na; minor Fe^{3+} may replace Al; very minor Br, I, may replace Cl; isometric)

$\text{Na}_8[\text{Al}_6\text{Si}_6\text{O}_{24}]\text{Cl}_2$
 $\text{Na}_8[\text{Al}_6\text{Si}_6\text{O}_{24}](\text{SO}_4)\cdot\text{H}_2\text{O}$
 $\text{Na}_6\text{Ca}_2[\text{Al}_6\text{Si}_6\text{O}_{24}](\text{SO}_4)_2$
 $\text{Na}_6\text{Ca}_2[\text{Al}_6\text{Si}_6\text{O}_{24}]\text{S}_2$
 $\text{Ca}_8[\text{Al}_8\text{Si}_4\text{O}_{24}](\text{OH})_2$ (two polymorphs)
 $\text{Na}_8[\text{Be}_2\text{Al}_2\text{Si}_4\text{O}_{24}]\text{Cl}_2$
 $\square_8[\text{Al}_2\text{Si}_{10}\text{O}_{24}][\text{N}(\text{CH}_3)_4]_2$
 $\text{Fe}^{2+}_8[\text{Be}_6\text{Si}_6\text{O}_{24}]\text{S}_2$
 $\text{Mn}^{2+}_8[\text{Be}_6\text{Si}_6\text{O}_{24}]\text{S}_2$
 $\text{Zn}_8[\text{Be}_6\text{Si}_6\text{O}_{24}]\text{S}_2$

Cancrinite group is structurally similar to the sodalite group [hexagonal and trigonal]

Scapolite group

$^{\text{cage}}\text{A}_4[\text{T}_{12}\text{O}_{24}]^{\text{cage}}\text{X}$ (note similarity to sodalite group; K, minor Sr [especially in more Ca-rich varieties], may replace Na; minor Fe^{3+} may replace Al; very minor Br, I, may replace Cl; tetragonal)

$\text{Na}_4[\text{Al}_3\text{Si}_9\text{O}_{24}]\text{Cl}$
 $\text{Ca}_4[\text{Al}_6\text{Si}_6\text{O}_{24}](\text{SO}_4)$
 $\text{Ca}_4[\text{Al}_6\text{Si}_6\text{O}_{24}](\text{CO}_3)$

Zeolite group

$^{\text{cage}}\text{A}_x[\text{T}_y\text{O}_{2y}]^{\text{cage}}\text{nH}_2\text{O}$ (cage components can typically be exchanged without damage to the aluminosilicate framework)

$\text{Na}[\text{AlSi}_2\text{O}_6]\cdot\text{H}_2\text{O}$
 $\text{Na}_2[\text{Al}_2\text{Si}_3\text{O}_{10}]\cdot 2\text{H}_2\text{O}$
 $\text{NaCa}_2[\text{Al}_5\text{Si}_5\text{O}_{20}]\cdot 6\text{H}_2\text{O}$
 $\text{Ca}_2[\text{Al}_4\text{Si}_8\text{O}_{24}]\cdot 13\text{H}_2\text{O}$

+ many additional zeolites, including those with $^{\text{cage}}\text{A} = \text{K}, \text{Ba}, \text{and Sr}$ dominant, and some with additional Mg+Fe