

## Index of substances for Volume III/27I3

The Index of substances consists of two parts:

- A) Alphabetical index of element systems
- B) Alphabetical index of mineral names

### 1. Arrangement for A):

The substances are arranged alphabetically according to their "element system", i.e. the system of their alphabetically ordered elements, without consideration of the number of each element (first column of the Index).

Examples:

$\text{CuGe}_{1-x}\text{Si}_x\text{O}_3$  is listed under Cu-Ge-O -Si  
 $\text{Na}_6\text{CaZrSi}_6\text{O}_{18}$  under Ca-Na-O -Si-Zr  
 $\text{Ca}_7(\text{Si}_6\text{O}_{18})(\text{CO}_3) \cdot 2\text{H}_2\text{O}$  under C -Ca-H -O -Si  
 $\text{P}_2\text{O}_5\text{-SiO}_2\text{-R}_2\text{O}_3\text{-CaO-SrO-MnO-Na}_2\text{O-K}_2\text{O}$  under Ca-K -Mn-Na-O -P -R -Si-Sr  
 $\text{Be}_3\text{Al}_2\text{Si}_6\text{O}_{18} \cdot \text{Cr}^{3+}$  under Al-Be-Cr-O -Si  
 $\square\text{Mn}^{2+}_2\text{AlAl}_6\text{Si}_6\text{O}_{18}(\text{BO}_3)_3(\text{OH})_3(\text{OH})$  under Al-B -H -Mn-O -Si

Within one "element system", the compounds are arranged firstly alphabetically according to the chemical formula as given in the text/tables/figures, secondly according to the increasing number of the first (second, third, ...) atom of the chemical formula.

Examples for the arrangement of substances within a special "element system":

|                    |                                                       |                       |                                                                |
|--------------------|-------------------------------------------------------|-----------------------|----------------------------------------------------------------|
| System Ca-Na-O -Si | $\text{Na}_{2.2}\text{Ca}_{1.9}\text{Si}_3\text{O}_9$ | System H -Na-O -Si-Zr | $\text{H}_5\text{Na}_3\text{Zr}[\text{Si}_6\text{O}_{18}]$     |
|                    | $\text{Na}_4\text{CaSi}_3\text{O}_9$                  |                       | $\text{H}_6\text{Na}_2\text{Zr}[\text{Si}_6\text{O}_{18}]$     |
|                    | $\text{Na}_4\text{Ca}_4[\text{Si}_6\text{O}_{18}]$    |                       | $\text{Na}_2\text{ZrSi}_3\text{O}_9 \cdot \text{H}_2\text{O}$  |
|                    | $\text{Na}_6\text{Ca}_3[\text{Si}_6\text{O}_{18}]$    |                       | $\text{Na}_2\text{ZrSi}_3\text{O}_9 \cdot 2\text{H}_2\text{O}$ |

In doubt the reader is recommended to check all compounds belonging to the respective "element system". The user is advised to look also for the name of compound in the "Alphabetical index of mineral names", as in many cases only the formula or the name of a special substance is given in the data part.

The chemical formulae of the substances are generally given as listed in the respective text, tables and figures, or in one of the different formulations used in text, tables and figures (second column).

In some cases more general formulations were used for groups of substances like e.g.  $\text{A}_2\text{MSi}_3\text{O}_9$ ,  $\text{AM}_3\text{M}'_2(\text{Si},\text{Al})_{12}\text{O}_{30}$ ,  $\text{NaFe}^{2+}\text{Ba}_2\text{R}_2\text{Ti}_2\text{Si}_8\text{O}_{26}\text{OH} \cdot \text{H}_2\text{O}$ , or  $\text{A}_2(\text{OT}_3\text{X}_9)$ . These formulations were sometimes also considered in the Index (under the systems A -M-O -Si, A -Al-M -M' -O -Si, Ba-Fe-H -Na-O -R -Si-Ti, or A -O -T -X), and the meaning of the A, M, M', R, T or X was added where possible.

Column 3 gives the page number on which data of the individual substances can be found.

### 2. Arrangement for B):

This index contains in alphabetical order only those mineral names of silicates which are explicitly mentioned in the text, tables or figures (first column of index), and the page numbers (second column). This index should be used especially in case of unknown chemical formula.

## A) Alphabetical index of element systems

| Element system                                           | Chemical formula                                                                                                                                                                                  | Page          |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| <b>A -A' -B -B' -Ge-O -Si</b>                            | $A_{2-x}A'_x(B_{1-z}B'_z)Si_yGe_{3-y}O_9$ (A, A' = K, Rb, Cs, Tl and B, B' = Ti, Sn, Ge)                                                                                                          | 3             |
| <b>A -Al-M -M' -O -Si</b>                                | $AM_3M'_2(Si,Al)_{12}O_{30}$ (A = K, Ba; M = Zn, Mn, Al, Fe; M' = Mg, Mn, Fe)                                                                                                                     | 219           |
| <b>A -B -C -D -H. O -T</b>                               | $[^6]A_2[^9]B_2[^{12}]C[^{18}]D[^4]T_2T_3[^4]T_1O_{30}(H_2O)_x$                                                                                                                                   | 218           |
| <b>A -B -Ge-O -Si</b>                                    | $A_{2-x}A'_x(B_{1-z}B'_z)Si_yGe_{3-y}O_9$ (A, A' = K, Rb, Cs, Tl; B, B' = Ti, Sn, Ge)                                                                                                             | 3, 16         |
| <b>A -B -O -Si</b>                                       | $(A^{+}_{4-2x}B^{2+}_x)^{[6]}Si_m(^{[4]}Si_nO_{2(m+n)+2})$ (A, B = alkali, alkaline earth elements)                                                                                               | 1             |
| <b>A -Ge-O -Si-Ta</b>                                    | $ATa(Ge_{3-y}Si_y)O_9$ (A = K, Rb, Tl)                                                                                                                                                            | 4             |
| <b>A -M -M' -O -Si</b>                                   | $A_xM_3M'_2Si_{12}O_{30}$ (A = Na, K, Rb; M = Mg, Zn, $Fe^{2+}$ , $Cu^{2+}$ , Li; M' = Mg, $Cu^{2+}$ , $Fe^{2+}$ )                                                                                | 219, 224, 225 |
| <b>A -M -O -Si</b>                                       | $A_2MSi_3O_9$ (A = K, Rb, Cs; M = Zr, Ti, Hf, Sn)                                                                                                                                                 | 1             |
|                                                          | $A_3M_6Si_4O_{26}$                                                                                                                                                                                | 16            |
| <b>A -M -O -T</b>                                        | $A_2MT_3O_9$                                                                                                                                                                                      | 1             |
| <b>A -Mg-O -Si</b>                                       | $A_2Mg_5Si_{12}O_{30}$ (A = K, Na)                                                                                                                                                                | 219           |
| <b>A -O -Si-Ta</b>                                       | $A_3Ta_6Si_4O_{26}$ (A = Ba, Sr)                                                                                                                                                                  | 4             |
| <b>A -O -T -X</b>                                        | $A_2(OT_3X_9)$                                                                                                                                                                                    | 242           |
| <b>Al-B -Ba-Be-Ca-F -O -Pb-Si</b>                        | $Ba_2Ca_2Pb_2(B,Si,Al)_2(Si,Be)_{10}O_{28}F$                                                                                                                                                      | 244           |
| <b>Al-B -Be-Ca-Cl-Cu-F -Fe-K -Mg-Mn-Na-O -Pb-Si</b>      | $(K_{0.280}B_{1.942}Pb_{1.669}Ca_{2.068}Na_{0.082})(Mn^{2+}_{0.061}-Mg_{0.033}Cu^{2+}_{0.016}Fe^{3+}_{0.012}Al_{0.052}Si_{0.191}B_{1.598})-(Si_{1.555}Be_{0.445})Si_8O_{28}(F_{0.775}Cl_{0.025})$ | 246           |
| <b>Al-B -Ca-Cl-Cr-F -Fe-H -K -Li-Mg-Mn-Na-O -Si-Ti</b>   | $(Na_{0.797}K_{0.013}Ca_{0.062}Al_{6.437}Ti_{0.075}Fe^{3+}_{2.624}Mg_{0.042}Mn_{0.016}Cr_{0.001}Li_{0.016}B_{3.015}Si_{5.821}O_{31}F_{0.836}Cl_{0.003}-H_{0.285})$                                | 162           |
| <b>Al-B -Ca-Cl-Cr-F -Fe-H -K -Li-Mg-Mn-Na-O -Si-Ti-V</b> | $(Na_{0.471}K_{0.029}Ca_{0.368}Al_{5.245}Li_{0.018}Ti_{0.034}Fe^{2+}_{0.293}-Fe^{3+}_{0.864}Mg_{2.207}Mn_{0.012}Cr_{0.003}V_{0.001}B_{3.048}Si_{6.164}-F_{0.495}Cl_{0.004}H_{3.028}O_{31})$       | 161           |
|                                                          | $Na_{0.711}K_{0.043}Ca_{0.100}Al_{7.014}Li_{0.006}Ti_{0.049}Fe^{2+}_{1.005}-Fe^{3+}_{0.179}Mg_{0.844}Mn_{0.003}Cr_{0.003}V_{0.007}B_{3.011}Si_{5.657}-F_{0.302}Cl_{0.001}H_{3.466}O_{31})$        | 161           |
| <b>Al-B -Ca-Cl-Cr-F -Fe-H -K -Li-Mn-Na-O -Si-Ti-V</b>    | $Ca_{0.017}Na_{0.533}K_{0.040}Li_{0.001}Fe^{2+}_{0.685}Fe^{3+}_{0.361}Mn_{0.003}Cr_{0.002}V_{0.014}Ti_{0.083}B_{3.03}Si_{6.035}Al_{6.573}O_{31}F_{0.106}-Cl_{0.001}H_{3.041})$                    | 161           |
| <b>Al-B -Ca-Cr-F -Fe-H -K -Li-Mg-Mn-Na-O -Si-Ti-Zn</b>   | $Na_{0.671}K_{0.006}Ca_{0.036}Al_{6.483}Ti_{0.127}Fe^{2+}_{1.385}Fe^{3+}_{0.073}-Mg_{1.007}Mn_{0.014}Cr_{0.001}Zn_{0.006}Li_{0.010}B_{3.005}Si_{5.938}O_{31}-F_{0.299}H_{3.166})$                 | 162           |
| <b>Al-B -Ca-Cr-F -Fe-H -K -Li-Mn-Na-O -Si-Zn</b>         | $SiO_2 - 37.72; B_2O_3 - 11.21; Al_2O_3 - 42.75; Fe_t - 0.01; MnO - 0.01; ZnO - 0.01; Cr_2O_3 - 0.01; CaO - 0.01; Na_2O - 1.85; K_2O - 0.01; Li_2O - 1.23; F - 0.46; OH - 0.14$ (in wt%)          | 162           |

| Element system                                   | Chemical formula                                                                                                                                                                                                                                                                                                                                                                                             | Page |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| <b>Al-B -Ca-Cr-F -Fe-H -K -Mg-Na-O -Si-Ti</b>    | $\text{Na}_{0.374}\text{K}_{0.006}\text{Ca}_{0.511}\text{Fe}^{3+}_{0.008}\text{Cr}_{0.001}\text{Mg}_{3.309}\text{Al}_{5.744}\text{-B}_{3.039}\text{Ti}_{0.004}\text{Si}_{5.961}\text{O}_{31}\text{H}_{3.127}\text{F}_{0.615}$                                                                                                                                                                                | 162  |
| <b>Al-B -Ca-Cr-F -Fe-H -Li-Mg-Mn-Na-O -Si-Ti</b> | $\text{Na}_{0.697}\text{Ca}_{0.153}\text{Al}_{5.858}\text{Ti}_{0.037}\text{Fe}^{2+}_{1.497}\text{Fe}^{3+}_{0.264}\text{-Mg}_{1.474}\text{Mn}_{0.006}\text{Cr}_{0.001}\text{Li}_{0.001}\text{B}_{3.028}\text{Si}_{6.025}\text{O}_{31}\text{F}_{0.013}\text{-H}_{3.326}$                                                                                                                                       | 162  |
| <b>Al-B -Ca-Cr-F -H -K -Li-Mg-Mn-Na-O -Ti-Zn</b> | $\text{Na}_{0.523}\text{K}_{0.002}\text{Ca}_{0.078}\text{Li}_{1.557}\text{Mn}_{0.030}\text{Mg}_{0.005}\text{Zn}_{0.001}\text{-Al}_{7.794}\text{B}_{3.052}\text{Cr}_{0.001}\text{B}_{3.052}\text{Ti}_{0.009}\text{H}_{3.325}\text{F}_{0.651}\text{O}_{31}$                                                                                                                                                    | 162  |
| <b>Al-B -Ca-Cr-Fe-H -K -Mg-Mn-Na-O -Si-Ti</b>    | $^{\text{X}}(\text{Na}_{0.814}\text{Ca}_{0.009}\text{K}_{0.014}\square_{0.163})^{\text{Y}}(\text{Mg}_{1.301}\text{Mn}_{0.003}\text{-Fe}^{2+}_{0.051}\text{Fe}^{3+}_{0.560}\text{Cr}_{0.006}\text{Ti}_{0.030}\text{Al}_{0.985})^{\text{Z}}(\text{Al}_{5.090}\text{-Mg}_{0.910})(\text{BO}_3)_3\text{Si}_6\text{O}_{18}(\text{O},\text{OH})_4$                                                                 | 161  |
| <b>Al-B -Ca-Cr-Fe-H -Mg-Mn-Na-O -Si-Ti-V</b>     | $(\text{Na}_{0.97}\text{Ca}_{0.03})(\text{Mg}_{2.57}\text{Mn}_{0.03}\text{V}_{0.22}\text{Al}_{0.16}\text{Ti}_{0.02})\text{-}(\text{Cr}_{4.71}\text{Fe}^{3+}_{1.08}\text{Al}_{0.21})(\text{B}_{2.91}\text{Al}_{0.09})(\text{Si}_{5.81}\text{Al}_{0.19})\text{O}_{27}\text{-}(\text{O}_{0.23}\text{OH}_{3.77})$                                                                                                | 161  |
| <b>Al-B -Ca-F -Fe-H -K -Li-Mg-Mn-Na-O -Si</b>    | $(\text{Na}_{0.86}\text{K}_{0.09}\text{Ca}_{0.05})(\text{Li}_{0.99}\text{Mg}_{0.27}\text{Mn}_{0.23}\text{Fe}^{2+}_{0.10}\text{-Al}_{1.41})\text{Al}_{6.00}\text{B}_{2.93}\text{Si}_{6.00}\text{O}_{27.26}(\text{OH})_{3.64}\text{F}_{0.10}$                                                                                                                                                                  | 161  |
| <b>Al-B -Ca-F -Fe-H -K -Li-Mg-Mn-Na-O -Si-Ti</b> | $\text{Na}_{2.63}\text{Ca}_{0.34}\text{K}_{0.03}(\text{Fe}^{2+}_{4.92}\text{Al}_{1.33}\text{Fe}^{2+}_{1.25}\square_{0.52}\text{Mg}_{0.32}\text{-Ca}_{0.21}\text{Ti}^{4+}_{0.20}\text{Li}_{0.20}\text{Mn}^{2+}_{0.05})(\text{Al}_{16.82}\text{Fe}^{2+}_{1.18})\text{B}_{9.00}\text{-Si}_{18.00}\text{O}_{81.89}(\text{F},\text{OH})_{11.11}$                                                                  | 161  |
|                                                  | $\text{Na}_{0.522}\text{K}_{0.002}\text{Ca}_{0.007}\text{Al}_{6.915}\text{Ti}_{0.010}\text{Fe}^{2+}_{1.774}\text{Mg}_{0.386}\text{-Mn}_{0.033}\text{Li}_{0.121}\text{B}_{3.006}\text{Si}_{5.895}\text{O}_{31}\text{F}_{0.181}\text{H}_{3.390}$                                                                                                                                                               | 162  |
| <b>Al-B -Ca-F -Fe-H -K -Li-Mn-Na-O -Si</b>       | $\text{Na}_{0.528}\text{K}_{0.004}\text{Ca}_{0.128}\text{Li}_{1.773}\text{Fe}^{3+}_{0.007}\text{Mn}_{0.023}\text{Al}_{7.617}\text{-B}_{3.367}\text{Si}_{5.753}\text{H}_{2.921}\text{F}_{0.484}\text{O}_{31}$                                                                                                                                                                                                 | 162  |
|                                                  | $\text{Na}_{0.532}\text{K}_{0.004}\text{Ca}_{0.104}\text{Li}_{1.550}\text{Fe}^{3+}_{0.001}\text{Mn}_{0.022}\text{Al}_{7.807}\text{-B}_{3.202}\text{Si}_{5.797}\text{O}_{31}\text{H}_{2.977}\text{F}_{0.464}$                                                                                                                                                                                                 | 162  |
| <b>Al-B -Ca-F -Fe-H -K -Li-Mn-Na-O -Si-Ti</b>    | $(\text{Na}_{0.46}\text{K}_{0.01}\text{Ca}_{0.08}\square_{0.45})(\text{Al}_{2.18}\text{Li}_{0.53}\text{Mn}_{0.22}\text{Fe}^{3+}_{0.02}\text{-Ti}_{0.005})(\text{Al}_{6.00}\text{B}_{2.96}\text{Si}_{6.09}\text{O}_{27}(\text{O}_{1.47}\text{OH}_{2.44}\text{F}_{0.09}))$                                                                                                                                     | 161  |
|                                                  | $\text{Na}_{0.518}\text{K}_{0.004}\text{Ca}_{0.099}\text{Li}_{1.562}\text{Fe}^{3+}_{0.001}\text{Mn}_{0.015}\text{Al}_{7.894}\text{-B}_{3.280}\text{Si}_{5.690}\text{Ti}_{0.001}\text{O}_{31}\text{H}_{2.895}\text{F}_{0.499}$                                                                                                                                                                                | 162  |
|                                                  | $(\text{Na}_{0.716}\text{K}_{0.006}\text{Ca}_{0.031})(\text{Li}_{0.686}\text{Mn}_{1.221}\text{Fe}_{0.004}\text{Ti}_{0.015}\text{-Al}_{1.039})\text{Al}_6\text{B}_{2.94}\text{Si}_{5.661}\text{Al}_{0.339}\text{OH}_{3.929}\text{F}_{0.449}$                                                                                                                                                                  | 161  |
| <b>Al-B -Ca-F -Fe-H -K -Mg-Mn-Na-O -Si-Sr-Ti</b> | $(\text{Ca}_{1.56}\text{Na}_{1.35}\text{Sr}_{0.05}\text{K}_{0.04})(\text{Mg}_{7.78}\text{Fe}^{2+}_{1.22})\text{B}_{9.00}\text{-}(\text{Al}_{14.91}\text{Fe}^{2+}_{1.20}\text{Fe}^{3+}_{1.19}\square_{0.33}\text{Ti}_{0.28}\text{Ca}_{0.08}\text{Mn}^{2+}_{0.01})\text{-}(\text{Si}_{17.94}\text{B}_{0.06})\text{O}_{81.39}(\text{OH})_{9.21}\text{F}_{1.56}$                                                 | 162  |
| <b>Al-B -Ca-F -Fe-H -K -Mg-Mn-Na-O -Si-Ti</b>    | $(\text{Na}_{2.49}\text{Ca}_{0.39}\text{K}_{0.05}\square_{0.07})(\text{Fe}^{3+}_{5.99}\text{Al}_{2.65}\text{Ti}_{0.18}\text{Mg}_{0.08}\text{-Mn}_{0.05}\square_{0.05})\text{B}_{9.00}(\text{Al}_{16.32}\text{Fe}^{3+}_{0.93}\text{Fe}^{2+}_{0.56}\square_{0.11})(\text{Ti}_{0.04}\text{-Mg}_{0.02}\text{Mn}^{2+}_{0.02})(\text{Si}_{17.20}\text{B}_{0.80})\text{O}_{88.53}\text{F}_{3.08}(\text{OH})_{1.39}$ | 162  |
|                                                  | $(\text{Na}_{2.49}\text{K}_{0.05}\text{Ca}_{0.39}\square_{0.07})(\text{Fe}^{3+}_{6.93}\text{Fe}^{2+}_{0.56})\text{Ti}_{0.22}\text{-Mg}_{0.10}\text{Mn}_{0.06}\text{Al}_{0.97}\square_{0.16}\text{Al}_{18.00}\text{B}_{9.00}(\text{Si}_{17.20}\text{B}_{0.80})\text{-}(\text{O}_{88.63}\text{OH}_{1.39}\text{F}_{0.08})\text{F}_{3.00}$                                                                       | 161  |
| <b>Al-B -Ca-F -Fe-H -K -Mg-Mn-Na-O -Si-Ti-Zn</b> | $(\text{Na}_{0.66}\text{Ca}_{0.10}\text{K}_{0.01})(\text{Ti}_{0.10}\text{Al}_{0.62}\text{Fe}_{1.63}\text{Mn}_{0.02}\text{Zn}_{0.01}\text{-Mg}_{0.84})\text{Al}_{6.00}(\text{BO}_3)_3\text{Si}_{6.00}\text{O}_{18}\text{F}_{0.25}\text{OH}_{3.50}$                                                                                                                                                            | 162  |
| <b>Al-B -Ca-F -Fe-H -K -Mg-Na-O -Si</b>          | $\text{Na}_{0.39}\text{K}_{0.01}\text{Ca}_{0.60}\text{B}_{3.00}\text{Mg}_{3.55}\text{Fe}_{0.03}\text{Al}_{5.58}\text{Si}_{5.58}\text{-O}_{30.61}\text{F}_{0.49}\text{H}_{3.00}$                                                                                                                                                                                                                              | 162  |

| Element system                                | Chemical formula                                                                                                                                                                                                                                                                                          | Page |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| <b>Al-B -Ca-F -Fe-H -K -Mg-Na-O -Si-Ti</b>    | $(\text{Na}_{1.40}\text{Ca}_{1.30}\square_{0.24}\text{K}_{0.06})(\text{Mg}_{6.65}\text{Fe}^{2+}_{2.01}\text{Fe}^{3+}_{0.34})\text{-B}_{9.00}(\text{Al}_{13.39}\text{Fe}^{3+}_{3.77}\text{Ti}_{0.06}\square_{0.24})(\text{Si}_{17.76}\text{B}_{0.24})\text{O}_{81.29}\text{-(OH)}_{12.17}\text{F}_{0.29}$  | 162  |
| <b>Al-B -Ca-F -Fe-H -K -Mn-Na-O -Si-Ti</b>    | $(\text{Na}_{0.51}\text{K}_{0.01}\text{Ca}_{0.05}(\text{Al}_{2.91}\text{Mn}_{0.07}\text{Fe}_{0.02}\text{Ti}_{0.01})\text{Al}_6\text{B}_3\text{-Si}_6\text{O}_{27}(\text{O}_{2.53}\text{OH}_{1.44}\text{F}_{0.03}))$                                                                                       | 161  |
| <b>Al-B -Ca-F -Fe-H -Li-Mg-Mn-Na-O -Si-Ti</b> | $(\text{Ca}_{0.72}\text{Na}_{0.27})(\text{Li}_{1.59}\text{Al}_{1.13}\text{Fe}_{0.11}\text{Ti}_{0.05}\text{Mn}_{0.04}\text{Mg}_{0.03}\text{-}\square_{0.05})\text{Al}_{6.00}\text{B}_{3.00}\text{Si}_{6.02}(\text{O}_{27.27}(\text{OH})_{2.73})(\text{F}_{0.87}\text{-(OH)}_{0.13})$                       | 161  |
| <b>Al-B -Ca-F -Fe-H -Mg-Na-O -Si</b>          | $(\text{Na}_{0.01}\text{Ca}_{0.40}\text{Mg}_{0.50})(\text{Mg}_{5.01}\text{Fe}^{2+}_{0.29}\text{Al}_{0.49}\text{Fe}^{3+}_{0.21})\text{-(B}_{2.61}\text{Al}_{3.39})(\text{Si}_{5.38}\text{Al}_{0.62})[\text{O}_{25.98}(\text{OH})_{3.99}\text{F}_{0.03}]$                                                   | 162  |
| <b>Al-B -Ca-F -Fe-K -Li-Mn-Na-O -Si-Zn</b>    | $\text{Na}_2\text{O-2.45; CaO-0.43; K}_2\text{O-0.03; FeO-0.91; MnO-3.17; ZnO-0.04; Li}_2\text{O-1.54; Al}_2\text{O}_3\text{-39.50; SiO}_2\text{-37.10; F-1.50 (in wt\%)} \text{ (B content not mentioned, probably B}_{3.0} \text{ per f.u.)}$                                                           | 162  |
| <b>Al-B -Ca-F -Fe-K -Mn-Na-O -Si-Ti-Zn</b>    | $\text{SiO}_2 - 37.45; \text{B}_2\text{O}_3 - 11.51; \text{Al}_2\text{O}_3 - 41.41; \text{Fe}_t - 0.03; \text{MnO} - 0.05; \text{TiO}_2 - 0.01; \text{ZnO} - 0.15; \text{CaO} - 0.07; \text{Na}_2\text{O} - 1.88; \text{K}_2\text{O} - 0.01; \text{F} - 0.91 \text{ (in wt\%)}$                           | 162  |
| <b>Al-B -Ca-F -H -K -Li-Na-O -Si</b>          | $(\text{Na}_{0.516}\text{Ca}_{0.092}\text{K}_{0.009})(\text{Al}_{0.542}\text{Li}_{0.458})_3\text{-(Al}_{0.989}\text{Li}_{0.011})_6(\text{Si}_{0.928}\text{Al}_{0.036}\text{B}_{0.037})_6\text{B}_3\text{O}_{27}\text{-(OH)}_{2.895}\text{F}_{0.499}\text{O}_{0.606}$                                      | 161  |
| <b>Al-B -Ca-F -H -K -M -Mg-Na-O -Si</b>       | $(\text{Na}_{2.49}\text{K}_{0.05}\text{Ca}_{0.39}\square_{0.07})(\text{Mg}_{6.30}\text{Al}_{2.65}\square_{0.05})\text{B}_{9.00}\text{-(Al}_{16.32}\text{M}_{1.57}\square_{0.11})(\text{Si}_{17.20}\text{B}_{0.80})(\text{O}_{88.53}\text{OH}_{1.39}\text{F}_{0.08})\text{-F}_{3.00}$                      | 161  |
| <b>Al-B -Ca-F -H -K -Mn-Na-O -Si</b>          | $(\text{Na}_{0.51}\square_{0.43}\text{K}_{0.01}\text{Ca}_{0.05})(\text{Al}_{2.91}\text{Mn}_{0.10})\text{Al}_6(\text{Si}_6\text{O}_{18})\text{-(BO}_3)_3(\text{O}_{2.57}\text{OH}_{1.44}\text{F}_{0.03})$                                                                                                  | 146  |
| <b>Al-B -Ca-F -H -Li-Na-O -Si</b>             | $(\text{Na}_{0.517}\text{Ca}_{0.105})(\text{Al}_{0.576}\text{Li}_{0.424})_3(\text{Al}_{0.958}\text{Li}_{0.042})_6\text{-(Si}_{0.938}\text{Al}_{0.003}\text{B}_{0.059})_6\text{B}_3\text{O}_{27}[(\text{OH})_{2.921}\text{F}_{0.484}\text{O}_{0.595}]$                                                     | 161  |
|                                               | $^{\text{X}}(\text{Na}_{0.40}\text{Ca}_{0.29}\square_{0.31})^{\text{Y}}(\text{Al}_{2.42}\text{Li}_{0.36}\square_{0.22})^{\text{Z}}(\text{Al}_{5.92}\square_{0.08}\text{B}_3)^{\text{T}}(\text{Si}_{4.86}\text{B}_{1.06}\text{Al}_{0.08})\text{O}_{27}\text{-[F}_{0.06}(\text{OH})_{3.31}\text{O}_{0.63}]$ | 162  |
| <b>Al-B -Ca-F -H -Li-O -Si</b>                | $\text{Ca}(\text{Li},\text{Al})_3\text{Al}_6(\text{Si}_6\text{O}_{18})(\text{BO}_3)_3(\text{O},\text{OH})_3(\text{OH},\text{F})$                                                                                                                                                                          | 147  |
|                                               | $\text{Ca}(\text{Li}_{1.74}\text{Al}_{1.26})\text{Al}_6(\text{Si}_6\text{O}_{18})(\text{BO}_3)_3[(\text{OH})_{2.48}\text{O}_{0.52}]\text{-(F,OH)}$                                                                                                                                                        | 147  |
|                                               | $\text{Ca}(\text{Li}_2\text{Al})\text{Al}_6(\text{Si}_6\text{O}_{18})(\text{BO}_3)_3(\text{OH})_3\text{F}$                                                                                                                                                                                                | 147  |
| <b>Al-B -Ca-Fe-H -K -Mg-Mn-Na-O -Si-Ti</b>    | $(\text{Ca}_{0.62}\text{Na}_{0.39}\text{K}_{0.01})(\text{Fe}^{2+}_{1.53}\text{Mg}_{1.21}\text{Ti}_{0.29}\text{Mn}_{0.01})\text{-(Al}_{4.72}\text{Mg}_{0.82}\text{Fe}^{3+}_{0.34}\text{Fe}^{2+}_{0.12})(\text{BO}_3)_3(\text{Si}_{5.83}\text{Al}_{0.10})\text{-O}_{18}(\text{OH})_4$                       | 161  |
|                                               | $\text{Ca}_{3.90}(\text{Ti}_{0.01}\text{K}_{0.044}\text{Na}_{0.13}\text{Mn}_{0.26}\text{Fe}_{1.10}\text{Mg}_{0.37})\text{-(Al}_{3.56}\text{Fe}_{0.18})(\text{OH})_{1.96}\text{B}_{1.96}\text{Si}_8\text{O}_{29.34}$                                                                                       | 61   |
| <b>Al-B -Ca-Fe-H -Mg-Mn-O -Si</b>             | $(\text{Ca}_{1.85}\text{Mg}_{0.04}\text{Fe}^{2+}_{0.26}\text{Mn}^{2+}_{0.94})(\text{Al}_{2.03}\text{Fe}^{3+}_{0.01})\text{-B}_{0.99}\text{Si}_{3.98}\text{O}_{16}\text{H}_{0.83}$                                                                                                                         | 61   |
|                                               | $\text{Ca}_{3.94}\text{Mn}_{0.06}\text{Fe}^{2+}_{1.68}\text{Mg}_{0.30}\text{Al}_{3.95}\text{B}_{2.07}\text{Si}_{7.99}\text{O}_{30.0}\text{-(OH)}_2$                                                                                                                                                       | 61   |

| Element system                          | Chemical formula                                                                                                                                                                                                                                                                                  | Page |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| <b>Al-B -Ca-Fe-H -Mg-Mn-O -Si-Zn</b>    | $^{[6]}[\text{Ca}(\text{Ca}_{1-x}\text{Mn}_x)(\text{Mn,Fe}^{2+},\text{Mg,Zn,Al}_u\text{Fe}^{3+}_v) - (\text{Al}_{2-y}\text{Fe}^{3+}_y)]_2^{[4]}[(\text{B}_{1-z}\text{Si}_z)_2\text{Si}_{18}]\text{O}_{30}(\text{OH}_{1-w}\text{O}_w)_2$                                                           | 53   |
| <b>Al-B -Ca-Fe-H -Mg-O -Si</b>          | $\text{CaFe}_3(\text{Al,Mg})_6(\text{Si}_6\text{O}_{18})(\text{BO}_3)_3(\text{OH})_4$                                                                                                                                                                                                             | 146  |
|                                         | $\text{CaFe}^{2+}_3(\text{Al}_5\text{Mg})\text{Si}_6\text{O}_{18}(\text{BO}_3)_3(\text{OH})_3\text{OH}$                                                                                                                                                                                           | 147  |
| <b>Al-B -Ca-Fe-H -Mn-O -Si</b>          | $\text{Ca}_2(\text{Fe,Mn})\text{Al}_2\text{BSi}_4\text{O}_{16}\text{H}$                                                                                                                                                                                                                           | 61   |
|                                         | $(\text{Ca,Mn,Fe}^{3+})_3\text{Al}_2\text{BSi}_4\text{O}_{15}(\text{OH})$                                                                                                                                                                                                                         | 57   |
|                                         | $\text{Ca}_2\text{Mn}_{0.3}\text{Fe}_{0.7}\text{Al}_2\text{BSi}_4\text{O}_{16}\text{H}$                                                                                                                                                                                                           | 61   |
|                                         | $\text{Ca}_{3.87}\text{Mn}_{2.02}\text{Al}_{3.76}\text{Fe}^{3+}_{0.31}\text{Fe}^{2+}_{0.07}\text{B}_{1.99}\text{Si}_{8.02}\text{O}_{30.2-}(\text{OH})_{1.8}$                                                                                                                                      | 61   |
| <b>Al-B -Ca-Fe-H -O -Si</b>             | $\text{Ca}_2\text{FeAl}_2(\text{BO}_3\text{OH})(\text{SiO}_3)_4$                                                                                                                                                                                                                                  | 57   |
| <b>Al-B -Ca-Fe-Li-Mg-Mn-Na-O -Si</b>    | $\text{SiO}_2\text{-}35.90; \text{B}_2\text{O}_3\text{-}10.0; \text{Al}_2\text{O}_3\text{-}35.85; \text{Fe}_2\text{O}_3\text{-}6.00; \text{MnO}\text{-}1.18; \text{MgO}\text{-}0.09; \text{Na}_2\text{O}\text{-}4.75; \text{Li}_2\text{O}\text{-}2.58; \text{CaO}\text{-}0.02$ (in wt%)           | 161  |
|                                         | $\text{SiO}_2\text{-}36.34; \text{B}_2\text{O}_3\text{-}11.5; \text{Al}_2\text{O}_3\text{-}44.23; \text{Fe}_2\text{O}_3\text{-}1.48; \text{MnO}\text{-}1.33; \text{MgO}\text{-}0.15; \text{Na}_2\text{O}\text{-}2.41; \text{Li}_2\text{O}\text{-}1.51; \text{CaO} < 0.02$ (in wt%)                | 161  |
|                                         | $\text{SiO}_2\text{-}37.09; \text{B}_2\text{O}_3\text{-}11.8; \text{Al}_2\text{O}_3\text{-}44.47; \text{Fe}_2\text{O}_3\text{-}0.71; \text{MnO}\text{-}1.22; \text{MgO}\text{-}0.01; \text{Na}_2\text{O}\text{-}2.04; \text{Li}_2\text{O}\text{-}2.01; \text{CaO} < 0.02$ (in wt%)                | 161  |
|                                         | $\text{SiO}_2\text{-}35.93; \text{B}_2\text{O}_3\text{-}11.0; \text{Al}_2\text{O}_3\text{-}45.45; \text{Fe}_2\text{O}_3\text{-}2.30; \text{MnO}\text{-}1.49; \text{MgO}\text{-}0.10; \text{Na}_2\text{O}\text{-}2.22; \text{Li}_2\text{O}\text{-}1.88; \text{CaO} < 0.02$ (in wt%)                | 161  |
|                                         | $\text{SiO}_2\text{-}37.09; \text{B}_2\text{O}_3\text{-}11.2; \text{Al}_2\text{O}_3\text{-}30.95; \text{Fe}_2\text{O}_3\text{-}0.72; \text{MnO}\text{-}1.27; \text{MgO}\text{-}12.87; \text{Na}_2\text{O}\text{-}1.08; \text{Li}_2\text{O}\text{-}0.36; \text{CaO}\text{-}3.68$ (in wt%)          | 161  |
| <b>Al-B -Ca-Fe-Mg-Mn-Na-O -Si-Ti</b>    | $\text{Na}_2\text{O}\text{-}1.84; \text{CaO}\text{-}0.05; \text{MgO}\text{-}4.39; \text{FeO}\text{-}4.50; \text{MnO}\text{-}0.20; \text{TiO}_2\text{-}0.23; \text{Al}_2\text{O}_3\text{-}38.80; \text{SiO}_2\text{-}37.23$ (in wt%) (B content not mentioned, probably $\text{B}_{3.0}$ per f.u.) | 162  |
| <b>Al-B -Ca-H -Mg-Mn-O -Si</b>          | $\text{Ca}_2\text{MgAl}_2(\text{BO}_3\text{OH})(\text{SiO}_3)_4$                                                                                                                                                                                                                                  | 57   |
|                                         | $\text{CaMg}_3(\text{Al}_5\text{Mg})(\text{Si}_6\text{O}_{18})(\text{BO}_3)_3(\text{OH})_4$                                                                                                                                                                                                       | 146  |
|                                         | $\text{Ca}_{3.96}\text{Mn}_{0.07}\text{Mg}_{1.92}\text{Al}_{4.00}\text{B}_{2.00}\text{Si}_{8.04}\text{O}_{30.1}(\text{OH})_{1.9}$                                                                                                                                                                 | 61   |
| <b>Al-B -Ca-H -Mn-O -Si</b>             | $\text{Ca}_2\text{MnAl}_2(\text{BO}_3\text{OH})(\text{SiO}_3)_4$                                                                                                                                                                                                                                  | 57   |
| <b>Al-B -F -Fe-H -K -Mg-Na-O -Si</b>    | $(\text{Na}_{0.80}\text{K}_{0.24})(\text{Mg}_{1.58}\text{Fe}^{2+}_{1.15})(\text{Fe}^{3+}_{5.49}\text{Al}_{0.51})\text{Si}_6\text{B}_3\text{-(O,OH)}_{30}(\text{OH,F})$                                                                                                                            | 161  |
| <b>Al-B -Fe-H -K -Li-Mg-Mn-Na-O -Si</b> | $(\text{Na}_{0.98}\text{K}_{0.02})(\text{Li}_{0.80}\text{Mg}_{0.28}\text{Mn}_{0.34}\text{Fe}^{2+}_{0.20}\text{Fe}^{3+}_{0.38}\text{Al}_{1.00})\text{Al}_{6.0}\text{B}_{3.00}(\text{Si}_{5.82}\text{Al}_{0.18})\text{O}_{27.54}(\text{OH})_{3.32}$                                                 | 161  |
| <b>Al-B -Fe-H -K -Mg-Na-O -Si</b>       | $(\text{Na}_{0.80}\text{K}_{0.26})(\text{Fe}^{3+}_{2.28}\text{Fe}^{2+}_{0.27}\text{Mg}_{0.53})(\text{Fe}^{3+}_{4.29}\text{Mg}_{1.36}\text{Al}_{0.32})(\text{Si}_6\text{O}_{18})(\text{BO}_3)_3(\text{OH})_{3.12}\text{O}_{0.88}$                                                                  | 146  |
|                                         | $(\text{Na}_{0.80}\text{K}_{0.26})(\text{Fe}^{3+}_{2.28}\text{Fe}^{2+}_{0.27}\text{Mg}_{0.53})(\text{Fe}^{3+}_{4.29}\text{Mg}_{1.36}\text{Al}_{0.32})\text{B}_3\text{Si}_{5.96}\text{O}_{27.88}(\text{OH})_{3.12}$                                                                                | 161  |
| <b>Al-B -Fe-H -Li-Mg-Mn-Na-O -Si</b>    | $^x(\square_{0.75}\text{Na}_{0.25})^y(\text{Li}_{0.22}\text{Mg}_{0.05}\text{Fe}^{2+}_{1.60}\text{Mn}^{2+}_{0.24}\text{Al}_{0.89}) - ^z\text{Al}_6\text{Si}_{6.01}\text{O}_{18}(\text{BO}_3)_3(\text{OH})_4$                                                                                       | 161  |

| Element system                                               | Chemical formula                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Page     |
|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>Al-B -H -Li-Na-O -Si</b>                                  | $\text{Na}_{1-y}(\text{Al}_{3-x}\text{Li}_x)\text{Al}_6(\text{Si}_6\text{O}_{18})(\text{BO}_3)_3\text{-}[\text{O}_{3-2x-y}(\text{OH})_{1+2x+y}]$                                                                                                                                                                                                                                                                                                                                                                             | 146      |
| <b>Al-B -H -Mg-Na-O -Si</b>                                  | $\text{NaMg}_3\text{Al}_6(\text{BO}_3)_3(\text{Si}_6\text{O}_{18})(\text{OH})_4$                                                                                                                                                                                                                                                                                                                                                                                                                                             | 154, 177 |
| <b>Al-B -H -Mg-O -Si</b>                                     | $\square_{0.92}\text{Mg}_{0.08}(\text{Mg}_{1.98}\text{Al}_{1.02})\text{Al}_6(\text{Si}_{5.59}\text{Al}_{0.41})(\text{BO}_3)_3\text{-O}_{17.74}(\text{OH})_{4.28}$                                                                                                                                                                                                                                                                                                                                                            | 162      |
|                                                              | $\square_{0.04}\text{Mg}_{0.96}(\text{Mg}_{1.52}\text{Al}_{1.48})\text{Al}_6(\text{Si}_{5.23}\text{Al}_{0.77})(\text{BO}_3)_3\text{-O}_{19.60}(\text{OH})_{2.40}$                                                                                                                                                                                                                                                                                                                                                            | 162      |
| <b>Al-B -H -Mn-Na-O -Si</b>                                  | $\text{NaMn}^{2+}_2\text{AlAl}_6\text{Si}_6\text{O}_{18}(\text{BO}_3)_3(\text{OH})_3\text{O}$                                                                                                                                                                                                                                                                                                                                                                                                                                | 146      |
|                                                              | $\text{NaMn}^{2+}_3\text{Al}_6\text{Si}_6\text{O}_{18}(\text{BO}_3)_3(\text{OH})_3(\text{OH})$                                                                                                                                                                                                                                                                                                                                                                                                                               | 146      |
| <b>Al-B -H -Mn-O -Si</b>                                     | $\square\text{Mn}^{2+}_2\text{AlAl}_6\text{Si}_6\text{O}_{18}(\text{BO}_3)_3(\text{OH})_3(\text{OH})$                                                                                                                                                                                                                                                                                                                                                                                                                        | 146      |
|                                                              | $\square\text{Mn}^{2+}_2\text{Al}_2\text{Al}_6\text{Si}_6\text{O}_{18}(\text{BO}_3)_3(\text{OH})_3\text{O}$                                                                                                                                                                                                                                                                                                                                                                                                                  | 146      |
| <b>Al-B -H -Na-O -Si</b>                                     | $(\text{Na}_{0.65}\square_{0.35})(\text{Al}_{2.72}\square_{0.28})(\text{Al}_{5.42}\text{Si}_{0.58})[\text{Si}_{3.73}\text{B}_{2.27}\text{-O}_{18}](\text{BO}_3)_3(\text{OH})_{3.87}\text{O}_{0.13}$                                                                                                                                                                                                                                                                                                                          | 162      |
|                                                              | $\text{Na}_{0.7}\text{Al}_{2.9}\text{Al}_6[\text{Si}_{4.2}\text{B}_{1.8}\text{O}_{18}](\text{B}_3\text{O}_9)(\text{OH},\text{O})_4$                                                                                                                                                                                                                                                                                                                                                                                          | 161      |
|                                                              | $\text{Na}_{0.8}\text{Al}_{2.9}\text{Al}_6[\text{Si}_{3.8}\text{B}_{2.2}\text{O}_{18}](\text{B}_3\text{O}_9)(\text{OH},\text{O})_4$                                                                                                                                                                                                                                                                                                                                                                                          | 161, 164 |
|                                                              | $(\square_{0.96}\text{Na}_{0.04})\text{Al}_3(\text{Al}_{5.83}\square_{0.29})[(\text{Si}_{4.49}\text{B}_{1.51})\text{O}_{18}] - (\text{BO}_3)_3(\text{OH})_{3.21}\text{O}_{0.79}$                                                                                                                                                                                                                                                                                                                                             | 162      |
|                                                              | $\text{Na}_{1-x}\text{Al}_3\text{Al}_6(\text{Si}_6\text{O}_{18})(\text{BO}_3)_3(\text{O},\text{OH})_4$                                                                                                                                                                                                                                                                                                                                                                                                                       | 146      |
| <b>Al-Ba-Ca-Cl-Cr-Fe-H -K -Na-Nb-O -Si-Ti</b>                | $(\text{Ba}_{3.872}\text{Na}_{0.089}\text{Ca}_{0.040}\text{K}_{0.041})(\text{Ti}_{5.822}\text{Nb}_{1.322}\text{-Fe}^{2+}_{0.408}\text{Fe}^{3+}_{0.201}\text{Al}_{0.233}\text{Cr}_{0.009})(\text{Si}_{3.739}\text{Al}_{0.261})\text{O}_{12}\text{-}(\text{O}_{15.186}\text{OH}_{0.814})(\text{Cl}_{0.897}\text{OH}_{0.103})$                                                                                                                                                                                                  | 62       |
| <b>Al-Ba-Ca-Cl-F -Fe-H -K -Mg-Mn-Na-O -P -S -Si-Ti-Zr</b>    | $\text{SiO}_2\text{-}49.78; \text{TiO}_2\text{-}0.32; \text{ZrO}_2\text{-}0.44; \text{Al}_2\text{O}_3\text{-}2.45; \text{Fe}_2\text{O}_3\text{-}1.86; \text{FeO}\text{-}0.54; \text{MnO}\text{-}0.58; \text{MgO}\text{-}0.41; \text{CaO}\text{-}22.68; \text{BaO}\text{-}0.09; \text{Na}_2\text{O}\text{-}16.14; \text{K}_2\text{O}\text{-}1.18; \text{P}_2\text{O}_5\text{-}0.02; \text{F}\text{-}1.87; \text{Cl}\text{-}0.30; \text{SO}_3\text{-}0.19; \text{H}_2\text{O}^-\text{-}0.42; \text{H}_2\text{O}^+\text{-}1.39$ | 134      |
| <b>Al-Ba-Ca-Cl-F -Fe-H -K -Mg-Mn-O -Si-Sr-Ti</b>             | $(\text{Ba}_{9.82}\text{K}_{0.05}\text{Sr}_{0.03})\text{Ca}_{2.10}(\text{Mn}_{0.73}\text{Fe}_{0.14}\text{Mg}_{0.07})\text{Ti}_{1.32}\text{-}(\text{Si}_{9.31}\text{Al}_{0.26})\text{O}_{29.52}(\text{OH}_{5.05}\text{Cl}_{3.21}\text{F}_{1.86})$                                                                                                                                                                                                                                                                             | 61       |
|                                                              | $(\text{Ba}_{25.40}\text{Ca}_{1.17}\text{Sr}_{0.26}\text{K}_{0.08})(\text{Fe}_{4.45}\text{Mn}_{1.46}\text{Mg}_{0.57}) - \text{Ti}_{5.33}(\text{Si}_{35.17}\text{Al}_{0.49})\text{O}_{88.78}(\text{OH}_{43.09}\text{Cl}_{7.51}\text{F}_{1.60})$                                                                                                                                                                                                                                                                               | 134      |
| <b>Al-Ba-Ca-Cl-Fe-H -K -Mg-Mn-Na-Nb-O -R -Si-Sr-Ta-Ti-Zr</b> | $\text{SiO}_2 - 45.96; \text{ZrO}_2 - 13.58; \text{TiO}_2 - 0.25; \text{Nb}_2\text{O}_5 - 2.48; \text{Ta}_2\text{O}_5 - 0.08; \text{R}_2\text{O}_3 - 4.13; \text{Al}_2\text{O}_3 - 0.35; \text{Fe}_2\text{O}_3 - 0.97; \text{FeO} - 5.11; \text{MnO} - 2.29; \text{MgO} - 0.58; \text{CaO} - 9.55; \text{SrO} - 0.68; \text{BaO} - (\text{n.d.}); \text{Na}_2\text{O} - 11.92; \text{K}_2\text{O} - 0.60; \text{H}_2\text{O}^- - 0.60; \text{Cl} - 0.99 \text{ (in wt\%)} \text{ (R = rare earth element)}$                  | 22       |
| <b>Al-Ba-Ca-Cl-Fe-H -K -Mg-Mn-Na-Nb-O -R -Si-Sr-Ti-Zr</b>    | $\text{SiO}_2 - 49.93; \text{ZrO}_2 - 12.23; \text{TiO}_2 - 0.78; \text{Nb}_2\text{O}_5 - 0.16; \text{R}_2\text{O}_3 - 0.39; \text{Al}_2\text{O}_3 - 0.16; \text{Fe}_2\text{O}_3 - 0.67; \text{FeO} - 4.35; \text{MnO} - 0.46; \text{MgO} - 0.03; \text{CaO} - 11.08; \text{SrO} - 0.90; \text{BaO} - 0.20; \text{Na}_2\text{O} - 15.02; \text{K}_2\text{O} - 2.13; \text{H}_2\text{O}^- - 0.50; \text{Cl} - 2.06 \text{ (in wt\%)} \text{ (R = rare earth element)}$                                                        | 22       |

| Element system                                            | Chemical formula                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Page                    |
|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| <b>Al-Ba-Ca-Cl-Fe-H -K -Mg-Mn-O -Si-Sr-Ti</b>             | $\text{SiO}_2\text{-}27.30; \text{Al}_2\text{O}_3\text{-}0.45; \text{TiO}_2\text{-}5.71; \text{FeO}\text{-}4.46; \text{MnO}\text{-}1.35; \text{MgO}\text{-}0.32; \text{CaO}\text{-}0.89; \text{K}_2\text{O}\text{-}0.05; \text{BaO}\text{-}53.50; \text{SrO}\text{-}0.35; \text{Cl}\text{-}3.50; \text{H}_2\text{O}\text{-}2.52$ (in wt%)                                                                                                                              | 134                     |
| <b>Al-Ba-Ca-Cl-Fe-H -K -Mn-Na-Nb-O -R -Si-Sr-Ta-Ti-Zr</b> | $\text{SiO}_2 - 50.69; \text{ZrO}_2 - 11.39; \text{TiO}_2 - 0.55; \text{Nb}_2\text{O}_5 - 0.49; \text{Ta}_2\text{O}_5 - 0.03; \text{R}_2\text{O}_3 - 0.37; \text{Al}_2\text{O}_3 - 0.17; \text{Fe}_2\text{O}_3 - 0.40; \text{FeO} - 4.99; \text{MnO} - 0.55; \text{CaO} - 10.62; \text{SrO} - 0.79; \text{BaO} - (\text{n.d.}); \text{Na}_2\text{O} - 14.49; \text{K}_2\text{O} - 2.07; \text{H}_2\text{O} - 0.61; \text{Cl} - 1.91$ (in wt%) (R = rare earth element) | 22                      |
|                                                           | $\text{SiO}_2 - 48.46; \text{ZrO}_2 - 11.61; \text{TiO}_2 - 0.23; \text{Nb}_2\text{O}_5 - 1.56; \text{Ta}_2\text{O}_5 - 0.16; \text{R}_2\text{O}_3 - 3.33; \text{Al}_2\text{O}_3 - 0.31; \text{Fe}_2\text{O}_3 - 0.32; \text{FeO} - 5.30; \text{MnO} - 1.98; \text{CaO} - 9.79; \text{SrO} - 0.59; \text{BaO} - (\text{n.d.}); \text{Na}_2\text{O} - 13.69; \text{K}_2\text{O} - 0.54; \text{H}_2\text{O} - 0.84; \text{Cl} - 1.33$ (in wt%) (R = rare earth element)  | 22                      |
| <b>Al-Ba-Ca-Fe-H -K -Mg-O -Si-Ti</b>                      | $(\text{K}_{1.16}\text{Ba}_{0.72})(\text{Ti}_{3.38}\text{Mg}_{0.37}\text{Ca}_{0.14}\text{Fe}_{0.13})(\text{Si}_{4.41}\text{Al}_{0.99}\text{Fe}_{0.60})[\text{O}_{19.94}(\text{H}_2\text{O})_{6.06}]$                                                                                                                                                                                                                                                                   | 134                     |
| <b>Al-Ba-Ca-Fe-H -Mn-Na-O -Si-Sr-Ti</b>                   | $(\text{Na}_{0.11}\text{Fe}_{3.61}\text{Mn}_{0.24}\square_{0.05})\square_2\text{Ba}_4(\text{Ti}_{3.88}\text{Al}_{0.12}) - (\text{Ba}_{2.88}\text{Sr}_{0.88}\text{Ca}_{0.08}\text{Al}_{0.19})\text{O}_4[\text{Si}_4\text{O}_{12}]_4 \cdot 2.0\text{H}_2\text{O}$                                                                                                                                                                                                        | 61                      |
| <b>Al-Ba-Ca-Fe-K -Mg-Mn-Na-O -Si-Ti</b>                   | $\text{Na}_{0.09}\text{K}_{0.925}\text{Ca}_{0.018}\text{Ba}_{0.010}\text{Mg}_{1.882}\text{Mn}_{0.003}\text{Fe}_{0.380}\text{Ti}_{0.013}\text{Al}_{2.743}\text{Si}_{10.120}\text{Al}_{1.880}\text{O}_{30}$                                                                                                                                                                                                                                                              | 230                     |
| <b>Al-Ba-Ca-Fe-K -Mg-Na-O -Si-Ti</b>                      | $\text{K}_{0.93}\text{Na}_{0.09}\text{Ca}_{0.02}\text{Ba}_{0.01}\text{Mg}_{1.88}\text{Fe}_{0.38}\text{Ti}_{0.01}\text{Al}_{4.62}\text{Si}_{10.12}\text{O}_{30}$                                                                                                                                                                                                                                                                                                        | 230                     |
| <b>Al-Ba-Ca-H -O -Si</b>                                  | $\text{BaCa}_2[\text{Al}_6\text{Si}_9\text{O}_{30}] \cdot 2\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                                                                         | 225, 230                |
| <b>Al-Ba-H -K -Na-O -Si-Ti</b>                            | $\text{Ba}_2(\text{K},\text{Na})[\text{Ti}_2(\text{Si}_5\text{Al})\text{O}_{18}(\text{H}_2\text{O})](\text{H}_2\text{O})_n$                                                                                                                                                                                                                                                                                                                                            | 127, 134                |
|                                                           | $(\text{K},\text{Na})_2\text{Ba}_4\text{Ti}_4\text{Al}_2\text{Si}_{10}\text{O}_{36} \cdot 6\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                                         | 129                     |
| <b>Al-Ba-H -K -O -Si-Ti</b>                               | $(\text{K},\text{Ba})_2\text{Ti}_4(\text{Si},\text{Al})_6\text{O}_{14}(\text{OH})_{12}$                                                                                                                                                                                                                                                                                                                                                                                | 126, 129                |
| <b>Al-Ba-Mg-O -Si</b>                                     | $\text{BaMg}_2\text{Al}_6\text{Si}_9\text{O}_{30}$                                                                                                                                                                                                                                                                                                                                                                                                                     | 218, 222, 226, 229, 232 |
| <b>Al-Be-C -Fe-H -Li-Mg-Mn-Na-O -Si</b>                   | $\text{Na}_{0.27}^{[6]}(\text{Li}_{0.10}\text{Mg}_{1.32}\text{Fe}_{0.59}\text{Mn}_{0.02})^{[4]}(\text{Be}_{0.17}\text{Al}_{3.74}\text{Si}_{5.05})\text{O}_{18} \cdot 0.73\text{H}_2\text{O} \cdot 0.02\text{CO}_2$                                                                                                                                                                                                                                                     | 93                      |
| <b>Al-Be-Ca-H -K -Mn-Na-O -Si</b>                         | $\text{Ca}_{2.03}\text{K}_{1.05}\text{Na}_{0.06}\text{Mn}_{0.04}\text{Al}_{1.11}\text{Be}_{2.06}\text{Si}_{11.83}\text{O}_{30} - (\text{H}_2\text{O})_{1.20}$                                                                                                                                                                                                                                                                                                          | 230                     |
|                                                           | $\text{Ca}_{2.08}\text{K}_{0.96}\text{Na}_{0.16}\text{Mn}_{0.02}\text{Al}_{0.67}\text{Be}_{2.33}\text{Si}_{12.00}\text{O}_{30} - (\text{H}_2\text{O})_{1.68}$                                                                                                                                                                                                                                                                                                          | 230                     |
|                                                           | $\text{K}_{1.10}\text{Na}_{0.16}\text{Ca}_{2.00}\text{Mn}_{0.02}\text{Al}_{0.66}\text{Be}_{2.34}\text{Si}_{12}\text{O}_{30} \cdot 0.77\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                              | 230                     |
| <b>Al-Be-Ca-H -K -Na-O -Si</b>                            | $\text{Ca}_{1.67}\text{K}_{0.86}\text{Na}_{0.62}\text{Al}_{1.38}\text{Be}_{1.72}\text{Si}_{11.90}\text{O}_{30}(\text{H}_2\text{O})_{1.65}$                                                                                                                                                                                                                                                                                                                             | 230                     |
|                                                           | $\text{Ca}_2\text{KNa}_{1-x}(\text{Be}_{3-x}\text{Al}_x)\text{Si}_{12}\text{O}_{30} \cdot n\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                                         | 221, 225                |
|                                                           | $\text{Ca}_{4.00}\text{K}_{2.00}(\text{Na}_{0.12}\text{Ca}_{0.15}\text{H}_2\text{O}_{1.85})\text{Si}_{23.88}\text{Al}_{1.86}\text{Be}_{4.23}\text{O}_{30}$                                                                                                                                                                                                                                                                                                             | 230                     |
|                                                           | $\text{Ca}_{4.00}\text{K}_{2.00}(\text{Na}_{0.49}\text{K}_{0.33}\text{Ca}_{0.03}\text{H}_2\text{O}_{2.24})\text{Si}_{24.07}\text{Al}_{0.89}\text{Be}_{5.08}\text{O}_{30}$                                                                                                                                                                                                                                                                                              | 230                     |
|                                                           | $\text{K}_{1.15}\text{Na}_{0.05}\text{Ca}_{2.09}\text{Al}_{0.63}\text{Be}_{2.37}\text{Si}_{12}\text{O}_{30} \cdot 0.6\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                               | 230                     |

| Element system                                                  | Chemical formula                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Page               |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>Al-Be-Ca-H -K -Na-O -Si-Y</b>                                | $\text{Ca}_{1.96}\text{K}_{1.07}\text{Na}_{0.17}\text{Y}_{0.03}\text{Al}_{0.87}\text{Be}_{2.19}\text{Si}_{11.95}\text{O}_{30}(\text{H}_2\text{O})_{1.29}$                                                                                                                                                                                                                                                                                                                                                                                                                                            | 230                |
| <b>Al-Be-Ca-H -K -O -Si</b>                                     | $\text{Ca}_2\text{K}(\text{Be}_{2.3}\text{Al}_{0.7})\text{Si}_{12}\text{O}_{29.7}(\text{OH})_{0.3}(\text{H}_2\text{O})_{0.70}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 230                |
|                                                                 | $\text{KCa}_2[\text{AlBe}_2\text{Si}_{12}\text{O}_{30}]\cdot\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 225                |
| <b>Al-Be-Ca-K -Na-O -Si-Y</b>                                   | $\text{Ca}_{1.15}\text{K}_{1.06}\text{Na}_{0.02}\text{Y}_{0.62}\text{Al}_{0.05}\text{Be}_{2.82}\text{Si}_{12.13}\text{O}_{30}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 230                |
|                                                                 | $\text{Ca}_{1.42}\text{K}_{1.05}\text{Na}_{0.05}\text{Y}_{0.47}\text{Al}_{0.30}\text{Be}_{2.61}\text{Si}_{12.09}\text{O}_{30}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 230                |
| <b>Al-Be-Cr-H -O -Si</b>                                        | $\text{Be}_3(\text{Al}_{0.986}\text{Cr}_{0.014})_2\text{Si}_6\text{O}_{18}\cdot 0.36\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 86, 92             |
| <b>Al-Be-Cr-O -Si</b>                                           | $\text{Be}_3\text{Al}_2\text{Si}_6\text{O}_{18}\cdot\text{Cr}^{3+}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 83, 93             |
| <b>Al-Be-Cs-Fe-H -K -Li-Na-O -Rb-Si-Ti</b>                      | $\text{BeO} - 12.66; \text{Al}_2\text{O}_3 - 18.24; \text{SiO}_2 - 65.18; \text{Fe}_2\text{O}_3 - 0.006; \text{FeO} - 0.08; \text{TiO}_2 - 0.01; \text{Li}_2\text{O} - 0.69; \text{Na}_2\text{O} - 0.79; \text{K}_2\text{O} - 0.05; \text{Rb}_2\text{O} - 0.021; \text{Cs}_2\text{O} - 0.16; \text{H}_2\text{O}^+ - 1.68; \text{H}_2\text{O}^- - 0.02$ (in wt%)                                                                                                                                                                                                                                      | 93                 |
|                                                                 | $\text{BeO} - 13.60; \text{Al}_2\text{O}_3 - 18.20; \text{SiO}_2 - 65.92; \text{Fe}_2\text{O}_3 - 0.167; \text{FeO} - 0.11; \text{TiO}_2 - 0.020; \text{Li}_2\text{O} - 0.03; \text{Na}_2\text{O} - 0.13; \text{K}_2\text{O} - 0.013; \text{Rb}_2\text{O} - 0.001; \text{Cs}_2\text{O} - 0.75; \text{H}_2\text{O}^+ - 1.36; \text{H}_2\text{O}^- - 0.02$ (in wt%)                                                                                                                                                                                                                                    | 93                 |
| <b>Al-Be-Cs-Fe-H -K -Mg-Mn-Na-O -Sc-Si</b>                      | $\text{Be}_{3.06}[(\text{Sc}_{1.26}\text{Fe}_{0.17}\text{Al}_{0.03})(\text{Fe}^{2+}_{0.31}\text{Mn}_{0.13}\text{Mg}_{0.12})] - (\text{Na}_{0.55}\text{K}_{0.03}\text{Cs}_{0.01})[\text{Si}_{5.93}\text{Be}_{0.07}\text{O}_{18}]\cdot 0.87\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                         | 93                 |
| <b>Al-Be-Fe-Li-Mg-Mn-Na-O -Si</b>                               | $\text{Na}_{0.23-0.32}\text{Li}_{0.02-0.04}\text{Mg}_{1.40-1.49}\text{Fe}_{0.50-0.60}\text{Mn}_{0.01-0.02}\text{Al}_{3.76-3.91}\text{Be}_{0.15-0.21}\text{Si}_{4.94-4.97}\text{O}_{18}$                                                                                                                                                                                                                                                                                                                                                                                                              | 74, 93             |
| <b>Al-Be-H -Na-O -Si</b>                                        | $\text{Na}_{0.04}\text{Be}_{2.18}\text{Al}_2\text{Si}_6\text{O}_{18}\cdot 0.3\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 93                 |
| <b>Al-Be-H -O -Si</b>                                           | $\text{Al}_2\text{Be}_3\text{Si}_6\text{O}_{18}\cdot 0.1\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 91, 93             |
| <b>Al-Be-O -Si</b>                                              | $\text{Be}_3\text{Al}_2\text{Si}_6\text{O}_{18}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 77, 78, 89, 91, 93 |
| <b>Al-C -Ca-Ce-Dy-Er-Fe-Gd-H -K -Na-Nd-O -Si-Sm-Th-Ti-Y -Yb</b> | $\text{CaO} - 0.2992; \text{Na}_2\text{O} - 0.0006; \text{K}_2\text{O} - 0.0001; \text{Ce}_2\text{O}_3 - 0.0012; \text{Nd}_2\text{O}_3 - 0.0006; \text{Sm}_2\text{O}_3 - 0.0008; \text{Y}_2\text{O}_3 - 0.1119; \text{Gd}_2\text{O}_3 - 0.0067; \text{Dy}_2\text{O}_3 - 0.0083; \text{Er}_2\text{O}_3 - 0.0092; \text{Yb}_2\text{O}_3 - 0.0069; \text{Fe}_2\text{O}_3 - 0.0036; \text{Al}_2\text{O}_3 - 0.0118; \text{SiO}_2 - 0.5867; \text{TiO}_2 - 0.0003; \text{ThO}_2 - 0.0001; \text{CO}_2 - 0.1045; \text{H}_2\text{O}^+ - 0.1437;$ (in mol%); No. of atoms in the cell include $4\text{H}_2$ | 61                 |
| <b>Al-C -Fe-H -Mg-O -Si</b>                                     | $(\text{Mg},\text{Fe})\text{Al}_4\text{Si}_5\text{O}_{18}\times(\text{H}_2\text{O},\text{CO}_2)$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 73                 |
| <b>Al-Ca-Ce-Cl-F -Fe-H -K -Mn-Na-Nb-O -Si-Sr-Ti-Zr</b>          | $\text{Zr}_3[(\text{Mn}_{2.1}\text{Ca}_{0.72}\text{Ce}_{0.18})(\text{Na}_{1.35}\text{Ca}_{1.05}\text{Ce}_{0.45}\text{Sr}_{0.15})] - [\text{Si}_3\text{O}_9]_2[\text{Si}_9\text{O}_{27}]_2[\text{Fe}_{1.51}(\text{Zr}_{0.6}^{[4]}\text{Na}_{0.58}) - (\text{Ti}_{0.15}\text{Nb}_{0.12})^{[6]}][\text{Si}_{1.9}\text{Al}_{0.1}](\text{Na}_{1.4}\text{Sr}_{0.4}\text{K}_{0.2}) - (\text{OH},\text{O})_4(\text{F},\text{Cl})_{0.7}\cdot 1.1\text{H}_2\text{O}$                                                                                                                                           | 23                 |
| <b>Al-Ca-Ce-Cl-Fe-H -Mn-Na-O -Si-Sr-Ti-Zr</b>                   | $\text{Zr}_{3.63}\text{Ti}_{3.37}\text{Ca}_{8.5}\text{Mn}_{2.13}\text{Si}_{50.68}\text{Al}_{0.42}\text{Fe}_{0.94}\text{Na}_{34.43}\text{Sr}_{0.77}\text{Ce}_{1.13}\text{O}_{144}\text{Cl}_{0.9}(\text{OH})_{5.7}\cdot 1.5\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                                         | 22                 |
| <b>Al-Ca-Cl-F -Fe-H -Hf-K -Mg-Mn-Na-Nb-O -R -Si-Sr-Ti-Y -Zr</b> | $(\text{Na}_{14.93}\text{R}_{0.44}\text{Y}_{0.42}\text{K}_{0.30}\text{Sr}_{0.15})(\text{Ca}_{3.27}\text{Mn}_{1.78}\text{R}_{0.62}\text{Na}_{0.30})(\text{Mn}_{1.90}\text{Fe}_{0.72}\text{Al}_{0.13}\text{Mg}_{0.05})(\text{Nb}_{0.55}\text{Zr}_{0.12}\text{Ti}_{0.10})\text{Si}_{0.60}(\text{Zr}_{2.81}\text{Hf}_{0.06}\text{Ti}_{0.13})[(\text{Si}_3\text{O}_9)_2(\text{Si}_9\text{O}_{27})_2\text{O}_2](\text{F}_{1.51}\text{Cl}_{0.27}\text{OH}_{0.22})\cdot 2.3\text{H}_2\text{O}$ (R = rare earth element)                                                                                      | 23                 |



| Element system                                               | Chemical formula                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Page                 |
|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <b>Al-Ca-Cl-Fe-H -K -Mg-Mn-Na-Nb-O -R -S -Si-Sr-Ta-Ti-Zr</b> | $\text{SiO}_2 - 50.14; \text{TiO}_2 - 0.46; \text{ZrO}_2 - 11.83; \text{Al}_2\text{O}_3 - 0.07; \text{Fe}_2\text{O}_3 - 0.50; \text{FeO} - 5.32; \text{MgO} - 0.24; \text{CaO} - 11.18; \text{Na}_2\text{O} - 14.06; \text{K}_2\text{O} - 1.39; \text{MnO} - 0.60; \text{SrO} - 0.47; \text{R}_2\text{O}_3 - 0.37; (\text{Ta}, \text{Nb})_2\text{O}_5 - 0.11; \text{H}_2\text{O}^- - 0.12; \text{H}_2\text{O}^+ - 1.07; \text{S} - 0.04; \text{Cl} - 1.82; \text{O} = \text{Cl}_2 - 0.41 \text{ (in wt\%)} \text{ (R = rare earth el.)}$ | 22                   |
| <b>Al-Ca-Cl-Fe-H -K -Mg-Mn-Na-Nb-O -R -Si-Sr-Ti-Zr</b>       | $\text{SiO}_2 - 45.51; \text{ZrO}_2 - 11.86; \text{CaO} - 10.78; \text{FeO} - 4.52; \text{Fe}_2\text{O}_3 - 0.73; \text{R}_2\text{O}_3 - 5.62; \text{TiO}_2 - 0.39; \text{Nb}_2\text{O}_5 - 1.72; \text{Al}_2\text{O}_3 - 0.44; \text{MnO} - 1.70; \text{MgO} - 1.17; \text{SrO} - 1.43; \text{Na}_2\text{O} - 12.38; \text{K}_2\text{O} - 0.59; \text{H}_2\text{O} - 0.56; \text{Cl} - 1.28 \text{ (in wt\%)} \text{ (R = rare earth element)}$                                                                                         | 22                   |
| <b>Al-Ca-Cu-Fe-H -Na-O -Si-Zr</b>                            | $(\text{Ca}_{0.89}\text{Zr}_{0.15}\text{Na}_{0.03}\text{Cu}_{0.03})(\text{Zr}_{0.99}\text{Fe}_{0.01}) - (\text{Si}_{2.82}\text{Al}_{0.09})\text{O}_9 \cdot 3.3\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                                        | 246                  |
| <b>Al-Ca-Cu-H -O -Si</b>                                     | $\text{CaCuAlSi}_2\text{O}_6(\text{OH})_3$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 57                   |
| <b>Al-Ca-Fe-H -K -Li-Mg-Mn-Na-O -Si</b>                      | $(\text{Li}_{0.12}\text{Na}_{0.10}\text{Ca}_{0.03}\text{K}_{0.02})(\text{Mg}_{1.53}\text{Fe}_{0.45}\text{Mn}_{0.02}) - (\text{Si}_{4.93}\text{Al}_{4.04})\text{O}_{18.07}(\text{H}_2\text{O})_{0.48}$                                                                                                                                                                                                                                                                                                                                    | 93                   |
| <b>Al-Ca-Fe-H -K -Mg-Mn-Na-Nb-O -P -Si-Ti</b>                | $(\text{Na}_{5.51}\text{K}_{0.07}\text{Ca}_{0.05}\text{Mg}_{0.02}\text{Mn}_{0.42})(\text{Ti}_{0.64}\text{Fe}_{0.19}\text{Al}_{0.11}\text{Nb}_{0.07})(\text{Si}_{5.84}\text{P}_{0.07})\text{H}_{2.73}\text{O}_{18.39}$                                                                                                                                                                                                                                                                                                                    | 133                  |
| <b>Al-Ca-Fe-H -K -Mg-Mn-Na-O -Si</b>                         | $(\text{Ca}_{0.005}\text{Na}_{0.31}\text{K}_{0.78})(\text{Mg}_{0.92}\text{Fe}_{0.92}\text{Mn}_{0.16}) - (\text{Si}_{10.22}\text{Al}_{4.41}\text{Fe}^{3+}_{0.37})\text{O}_{30} \cdot \text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                  | 230                  |
|                                                              | $(\text{Na}_{0.05}\text{K}_{0.02}\text{Ca}_{0.02})(\text{Mn}_{0.01}\text{Mg}_{1.91}\text{Fe}_{0.08}) - (\text{Si}_{5.01}\text{Al}_{3.95})\text{O}_{18} \cdot 0.56\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                                     | 93                   |
| <b>Al-Ca-Fe-H -K -Mg-Mn-Na-O -Si-Ti</b>                      | $\text{Na}_{3.63}\text{K}_{1.82}\text{Ca}_{0.12}\text{Mn}^{2+}_{0.29}(\text{Mn}^{2+}_{1.95}\text{Fe}^{2+}_{0.93}\text{Mg}_{0.09}\text{Ti}_{0.02}\text{Fe}^{3+}_{0.01})(\text{Si}_{8.68}\text{Fe}^{3+}_{0.24}\text{Al}_{0.01})\text{O}_{24} \cdot 5.96\text{H}_2\text{O}$                                                                                                                                                                                                                                                                 | 134                  |
| <b>Al-Ca-Fe-H -K -Mg-Na-O -Si-Zr</b>                         | $(\text{Na}_{0.85}\text{K}_{0.09}\text{Ca}_{0.06})(\text{Ca}_{4.31}\text{Fe}_{0.56}\text{Mg}_{0.15})\text{Zr}_{4.22} - (\text{Si}_{15.44}\text{Al}_{0.32})\text{O}_{40}(\text{OH})_{10.70} \cdot 7.92\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                 | 23                   |
| <b>Al-Ca-Fe-H -Mg-Mn-Na-O -Si</b>                            | $(\text{Na}_{0.14}\text{Ca}_{0.05})(\text{Fe}^{2+}_{1.63}\text{Mg}_{0.28}\text{Mn}_{0.09}) - (\text{Al}_{1.94}\text{Fe}^{3+}_{0.08}\text{Si}_{0.93})\text{Al}_2\text{Si}_4\text{O}_{18} \cdot 0.67\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                    | 93                   |
|                                                              | $(\text{Na}_{0.15}\text{Ca}_{0.05})(\text{Mn}_{0.08}\text{Mg}_{0.25}\text{Fe}^{2+}_{1.65})(\text{Si}_{4.91}\text{Al}_{4.05}) \cdot 0.61\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                                                               | 93                   |
| <b>Al-Ca-Fe-K -Mg-Mn-Na-O -Si</b>                            | $(\text{K}_{0.94}\text{Na}_{0.76}\text{Ca}_{0.06})(\text{Fe}_{3.85}\text{Mg}_{1.27}\text{Mn}_{0.08}\text{Al}_{0.04})\text{Si}_{12}\text{O}_{30.11}$                                                                                                                                                                                                                                                                                                                                                                                      | 230                  |
|                                                              | $(\text{K}, \text{Na}, \text{Ca})_{0.98}(\text{Fe}, \text{Mg})_{2.00}(\text{Mg}, \text{Al}, \text{Mn})_{2.95} - (\text{Si}, \text{Al})_{12}\text{O}_{30}$                                                                                                                                                                                                                                                                                                                                                                                | 230                  |
| <b>Al-Ca-Fe-Mg-Mn-Na-O -Si-Ti</b>                            | $\text{Na}_{0.01}\text{Ca}_{0.01}\text{Mg}_{1.725}\text{Mn}_{0.003}\text{Fe}_{0.136}\text{Al}_{0.272}\text{Ti}_{0.002} - \text{Si}_{1.861}\text{O}_6$                                                                                                                                                                                                                                                                                                                                                                                    | 230                  |
| <b>Al-Ca-Fe-Mg-Na-O -Si</b>                                  | $\text{Na}_{0.039}\text{Ca}_{0.02}\text{Mg}_{2.092}\text{Fe}_{0.019}\text{Al}_{3.961}\text{Si}_{4.963}\text{O}_{18}$                                                                                                                                                                                                                                                                                                                                                                                                                     | 93                   |
| <b>Al-Ca-H -Na-O -Si-Zr</b>                                  | $(\text{Ca}_{0.98}\text{Na}_{0.04})\text{Zr}_{1.00}(\text{Si}_{2.94}\text{Al}_{0.04})\text{O}_9 \cdot 2.01\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                                                                                            | 23                   |
| <b>Al-Co-O -Si</b>                                           | $\text{Co}_2\text{Al}_4\text{Si}_5\text{O}_{18}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 79, 92, 94, 102, 103 |
| <b>Al-Fe-H -K -Li-Na-O -Si</b>                               | $^{\text{C}}(\text{K}_{0.81}\text{Na}_{0.19})^{\text{B}}(\text{H}_2\text{O}_{0.91}\text{Na}_{0.64})_2^{\text{A}}(\text{Fe}^{3+}_{1.32}\text{Na}_{0.59}\text{Ti}_{0.06}\text{Fe}^{2+}_{0.03})_2^{\text{T}2}(\text{Li}_{2.12}\text{Al}_{0.59}\text{Fe}^{3+}_{0.29})_3\text{Si}_{12}\text{O}_{30}$                                                                                                                                                                                                                                          | 230                  |
| <b>Al-Fe-H -Mg-Mn-Na-O -Si</b>                               | $\text{Na}_{0.03}(\text{Mg}_{1.2}\text{Fe}_{0.75}\text{Mn}_{0.05})\text{Al}_4\text{Si}_5\text{O}_{18} \cdot 0.4\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                                                                                       | 93                   |
| <b>Al-Fe-H -Mg-O -Si</b>                                     | $\text{Mg}_{1.11}\text{Fe}_{0.80}\text{Al}_{4.01}\text{Si}_{5.03}\text{O}_{18} \cdot n\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                                                                                                                | 93                   |
|                                                              | $\text{Mg}_{1.19}\text{Fe}_{0.73}\text{Al}_{4.03}\text{Si}_{5.01}\text{O}_{18} \cdot n\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                                                                                                                | 93                   |

| Element system                    | Chemical formula                                                                                                                                                                                                                                                    | Page                    |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| <b>Al-Fe-H -Mg-O -Si (cont.)</b>  | $\text{Mg}_{1.36}\text{Fe}_{0.64}\text{Al}_{4.03}\text{Si}_{4.98}\text{O}_{18} \cdot n\text{H}_2\text{O}$                                                                                                                                                           | 93                      |
|                                   | $\text{Mg}_{1.72}\text{Fe}_{0.27}\text{Al}_{4.00}\text{Si}_{5.00}\text{O}_{18} \cdot n\text{H}_2\text{O}$                                                                                                                                                           | 93                      |
|                                   | $\text{Mg}_{1.79}\text{Fe}_{0.19}\text{Al}_{4.02}\text{Si}_{5.00}\text{O}_{18} \cdot n\text{H}_2\text{O}$                                                                                                                                                           | 93                      |
|                                   | $\text{Mg}_{1.86}\text{Fe}_{0.14}\text{Al}_{4.03}\text{Si}_{4.98}\text{O}_{18} \cdot n\text{H}_2\text{O}$                                                                                                                                                           | 93                      |
|                                   | $(\text{Mg,Fe})_2\text{Al}_4\text{Si}_5\text{O}_{18} \cdot n\text{H}_2\text{O}$                                                                                                                                                                                     | 80                      |
| <b>Al-Fe-H -Na-O -Si</b>          | $\text{Na}_{0.04}\text{Fe}_{2.98}\text{Al}_2\text{Si}_6\text{O}_{18} \cdot 0.3\text{H}_2\text{O}$                                                                                                                                                                   | 78                      |
| <b>Al-Fe-K -Li-Mn-Na-O -Si</b>    | $\text{K}_{1.00}\text{Na}_{1.96}(\text{Fe,Mn})_{1.66}\text{Al}_{0.34}\text{Li}_{3.00}\text{Si}_{12}\text{O}_{30}$                                                                                                                                                   | 230                     |
|                                   | $(\text{Na,K})_3(\text{Fe}^{3+}, \text{Mn,Al})_2[\text{Li}_3\text{Si}_{12}\text{O}_{30}]$                                                                                                                                                                           | 225                     |
| <b>Al-Fe-K -Li-Na-O -Si-Ti-Zr</b> | $\text{K}(\text{Na}_{0.95}\text{K}_{0.05})(\text{Zr}_{0.8}\text{Fe}^{3+}_{0.6}\text{Ti}_{0.4}\text{Fe}^{2+}_{0.2})(\text{Li}_{2.55}\text{Al}_{0.15}\square_{0.30})\text{Si}_{12}\text{O}_{30}$                                                                      | 230                     |
|                                   | $\text{K}_{1.1}\text{Na}_{0.9}\text{Li}_{2.6}\text{Fe}^{2+}_{0.2}\text{Fe}^{3+}_{0.2}\text{Al}_{0.2}\text{Ti}_{0.4}\text{Zr}_{0.8}\text{Si}_{12}\text{O}_{30}$                                                                                                      | 230                     |
|                                   | $\text{K}(\square_{1.15}\text{Na}_{0.85})(\text{Zr}_{0.76}\text{Ti}^{4+}_{0.38}\text{Fe}^{3+}_{0.73}\text{Al}_{0.13}) - [\text{Li}_3\text{Si}_{12}\text{O}_{30}]$                                                                                                   | 230                     |
|                                   | $[\square, \text{Na}]_2\text{K}(\text{Zr, Ti}^{4+}, \text{Fe}^{3+}, \text{Al})_2[\text{Li}_3\text{Si}_{12}\text{O}_{30}]$                                                                                                                                           | 225                     |
|                                   | $(\text{Zr, Ti}^{4+}, \text{Fe}^{3+}, \text{Al})_2(\square, \text{Na})_2\text{K}[\text{Li}_3\text{Si}_{12}\text{O}_{30}]$                                                                                                                                           | 220                     |
| <b>Al-Fe-K -Mg-Mn-Na-O -Si</b>    | $^{[12]}(\text{Na}_{0.10}\text{K}_{0.89}\text{Fe}^{2+}_{0.37})^{[6]}(\text{Mg}_{1.43}\text{Fe}^{2+}_{0.53}\text{Mn}_{0.01}) - ^{[4]}(\text{Al}_{2.66})^{[4]}(\text{Si}_{10.3}\text{Al}_{1.70})\text{O}_{30}$                                                        | 230                     |
| <b>Al-Fe-K -Mg-Mn-Na-O -Si-Ti</b> | $(\text{K}_{1.14}\text{Na}_{0.10})(\text{Mg}_{3.29}\text{Fe}^{2+}_{0.67}\text{Mn}_{0.04})(\text{Fe}^{3+}_{0.64}\text{Fe}^{2+}_{0.29}\text{Al}_{0.04}\text{Ti}_{0.03})\text{Si}_{12.00}\text{O}_{30.00}$                                                             | 230                     |
|                                   | $^{[12]}(\text{Na}_{0.06}\text{K}_{0.69}\text{Fe}^{2+}_{0.10})^{[6]}(\text{Mg}_{0.75}\text{Fe}^{2+}_{1.01}\text{Fe}^{3+}_{0.06}\text{Ti}_{0.01}\text{Mn}_{0.17})^{[4]}(\text{Al}_{2.66}\text{Fe}^{3+}_{0.23})^{[4]}(\text{Si}_{10.3}\text{Al}_{1.70})\text{O}_{30}$ | 230                     |
| <b>Al-Fe-K -Mg-Na-O -Si</b>       | $(\text{K,Na})(\text{Fe,Mg})_2[(\text{Al,Fe})_3(\text{Si,Al})_{12}\text{O}_{30}]$                                                                                                                                                                                   | 225, 230                |
|                                   | $(\text{Na,K})_{1.5}\text{Mg}_2[(\text{Al,Mg,Fe})_3(\text{Si,Al})_{12}\text{O}_{30}]$                                                                                                                                                                               | 225                     |
|                                   | [wt %]: 60.6-SiO <sub>2</sub> ; 22.0-Al <sub>2</sub> O <sub>3</sub> ; 3-MgO; 9.4-FeO; 1.0-MgO; 0.7-Na <sub>2</sub> O; 3.2-K <sub>2</sub> O                                                                                                                          | 230                     |
| <b>Al-Fe-K -Mg-Na-O -Si-Ti</b>    | $\text{K}_{0.30}\text{Na}_{1.20}\text{Mg}_{2.00}(\text{Mg}_{0.60}\text{Fe}_{0.34}\text{Ti}_{0.10}\text{Al}_{1.96}) - (\text{Si}_{10.22}\text{Al}_{1.78})\text{O}_{30}$                                                                                              | 230                     |
| <b>Al-Fe-Mg-Mn-Na-O -Si</b>       | $\text{Mg}_{0.36}\text{Fe}^{2+}_{1.53}\text{Mn}^{2+}_{0.07}\text{Na}_{0.12}\text{Al}_{4.10}\text{Si}_{4.91}\text{O}_{18}$                                                                                                                                           | 93                      |
|                                   | $\text{Mg}_{1.62}\text{Fe}^{2+}_{0.41}\text{Mn}^{2+}_{0.01}\text{Na}_{0.03}\text{Al}_{3.98}\text{Si}_{4.99}\text{O}_{18}$                                                                                                                                           | 93                      |
| <b>Al-Fe-Mg-Na-O -Si</b>          | $\text{Mg}_{1.90}\text{Fe}^{2+}_{0.17}\text{Na}_{0.07}\text{Si}_{4.98}\text{Al}_{3.94}\text{Fe}^{2+}_{0.02}\text{O}_{18}$                                                                                                                                           | 93                      |
|                                   | $\text{Mg}_{1.90}\text{Fe}^{2+}_{0.19}\text{Na}_{0.07}\text{Al}_{3.97}\text{Fe}^{2+}_{0.02}\text{Si}_{4.95}\text{O}_{18}$                                                                                                                                           | 93                      |
|                                   | $\text{Na}_{0.13}\text{Mg}_{2.057}\text{Al}_{4.062}\text{Fe}_{0.002}\text{Si}_{4.92}\text{O}_{12}$                                                                                                                                                                  | 93                      |
| <b>Al-Fe-Mg-O -Si</b>             | $(\text{Fe,Mg})_2\text{Al}_4\text{Si}_5\text{O}_{18}$                                                                                                                                                                                                               | 72, 91                  |
|                                   | $\text{Mg}_{1.40}\text{Fe}_{0.66}\text{Al}_{4.11}\text{Si}_{4.89}\text{O}_{18}$                                                                                                                                                                                     | 93                      |
| <b>Al-Ga-Mg-O -Si</b>             | $\text{Mg}_2\text{Al}_{4-x}\text{Ga}_x\text{Si}_5\text{O}_{18}$                                                                                                                                                                                                     | 77                      |
| <b>Al-H -M -O -Si</b>             | $\text{M}_2\text{Al}_4\text{Si}_5\text{O}_{18} \cdot n\text{H}_2\text{O}$ (M = Mg, Fe, Mn)                                                                                                                                                                          | 75                      |
| <b>Al-H -Mg-O -Si</b>             | $\text{Mg}_2\text{Al}_4\text{Si}_5\text{O}_{18} \cdot n\text{H}_2\text{O}$                                                                                                                                                                                          | 82, 85                  |
| <b>Al-K -Mg-O -Si</b>             | $\text{K}_x\text{Mg}_2\text{Al}_{4+x}\text{Si}_{5-x}\text{O}_{18}$                                                                                                                                                                                                  | 74, 75, 82, 87, 93, 109 |
|                                   | $\text{KMg}_2(\text{Al}_{2.75}\text{Mg}_{0.25})(\text{Al}_{1.75}\text{Si}_{10.25})\text{O}_{30}$                                                                                                                                                                    | 230                     |
| <b>Al-M -Mg-O -Si</b>             | $\text{MMg}_2\text{Al}_6\text{Si}_9\text{O}_{30}$ (M = Sr, Ba)                                                                                                                                                                                                      | 222, 225, 228           |

| Element system                                      | Chemical formula                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Page                    |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| <b>Al-Mg-O -Si</b>                                  | $\text{Mg}_2\text{Al}_4\text{Si}_5\text{O}_{18}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 75, 91, 93, 108, 109    |
|                                                     | $\text{Mg}_2\text{Al}_4\text{Si}_{11}\text{O}_{30}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 218, 222, 225, 228, 229 |
| <b>Al-Mg-O -Si-Sr</b>                               | $\text{SrMg}_2\text{Al}_6\text{Si}_9\text{O}_{30}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 218, 222, 229, 232      |
| <b>Al-Mn-O -Si</b>                                  | $\text{Mn}_2\text{Al}_4\text{Si}_5\text{O}_{18}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 79, 92, 94, 102, 103    |
| <b>B -Ba-Be-Ca-F -O -Pb-Si</b>                      | $\text{Pb}_2\text{Ba}_2\text{Ca}_2[\text{B}_2(\text{Si}_{3/2}\text{Be}_{1/2})\text{Si}_8\text{O}_{28}]\text{F}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 241                     |
| <b>B -Ba-Ca-Fe-K -Mn-Na-Nb-O -Si-Ta-Ti</b>          | $(\text{Na}, \text{Ca})_{1.87}(\text{Ba}, \text{K})_{1.34}(\text{Mn}, \text{Fe})_{1.01}(\text{Ti}, \text{Nb}, \text{Ta})_{1.00}\text{B}_{1.78}\text{Si}_{5.95}\text{O}_{20}$                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 134                     |
| <b>B -Ba-Ca-H -K -Mn-Na-O -Si-Ti</b>                | $\text{KNa}_9\text{Ba}_6\text{Ca}_2\text{Mn}_6\text{Ti}_6\text{B}_{12}\text{Si}_{36}\text{O}_{123}(\text{OH})_2$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 126                     |
| <b>B -Ba-Cl-Fe-Mg-O -Si-Ti</b>                      | $\text{Ba}_4(\text{Fe}^{3+}, \text{Fe}^{2+}, \text{Ti}^{4+}, \text{Mg})_4(\text{B}_2\text{Si}_8\text{O}_{27})\text{O}_2\text{Cl}_x$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 54, 57                  |
| <b>B -Ba-Cl-Fe-O -Si-Ti</b>                         | $\text{Ba}_4(\text{Fe}, \text{Ti})_4(\text{B}_2\text{Si}_8\text{O}_{27})\text{O}_2\text{Cl}_x$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 56, 57                  |
| <b>B -Ba-Cl-H -Mn-O -Si-Ti-V</b>                    | $\text{Ba}_{4.01}(\text{V}^{3+}_{3.30}\text{Ti}_{0.51}\text{Mn}_{0.10})\text{B}_{1.71}\text{Si}_8\text{O}_{27.64}(\text{OH})_{1.28}\text{Cl}_{0.72}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 61                      |
| <b>B -Ba-Cl-O -Si-Ti-V</b>                          | $\text{Ba}_4(\text{V}, \text{Ti})_4(\text{B}_2\text{Si}_8\text{O}_{27})\text{O}_2\text{Cl}_x$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 55, 57                  |
| <b>B -C -Ca-H -K -Na-O -Si-Y</b>                    | $\text{K}_{10.00}\text{Na}_{10.80}\text{Y}_{20.56}\text{Ca}_{3.44}\text{Si}_{51.84}\text{B}_{4.16}\text{O}_{13.30}(\text{OH})_{11.20}(\text{CO}_3)_{16.0}(\text{H}_2\text{O})_{14.52}$                                                                                                                                                                                                                                                                                                                                                                                                                                              | 134                     |
| <b>B -Fe-H -Mg-Na-O -Si</b>                         | $\text{NaFe}_3^{3+}(\text{Fe}_4^{3+}\text{Mg}_2)(\text{Si}_6\text{O}_{18})(\text{BO}_3)_3(\text{OH})_3\text{O}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 146                     |
|                                                     | $\text{Na}(\text{Fe}_{2.28}^{3+}\text{Mg}_{0.80})(\text{Fe}_{4.61}^{3+}\text{Mg}_{1.36})(\text{Si}_6\text{O}_{18}) - (\text{BO}_3)_3(\text{OH})_{3.12}\text{O}_{0.88}$                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 146                     |
| <b>B -Fe-H -Na-O -Si</b>                            | $\text{NaFe}_3^{3+}\text{Fe}_6^{3+}(\text{Si}_6\text{O}_{18})(\text{BO}_3)_3(\text{O}, \text{OH})_4$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 146                     |
| <b>B -Ge-K -O -Si</b>                               | $\text{K}_2\text{B}(\text{Si}_y\text{Ge}_{3-y})\text{O}_9$ (B = Ti, Sn)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3, 27                   |
| <b>B -K -Na-O -Si</b>                               | $\text{KNa}_2\text{B}_3\text{Si}_{12}\text{O}_{30}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 220, 225                |
|                                                     | $\text{K}_{1.00}(\text{Na}_{1.87}\text{K}_{0.04})\text{B}_{3.05}\text{Si}_{12.14}\text{O}_{30}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 230                     |
| <b>B -O -T -V -W -X -Y -Z</b>                       | $\text{XY}_3\text{Z}_6[\text{T}_6\text{O}_{18}](\text{BO}_3)_3\text{V}_3\text{W}$ (X = $\text{Na}^+$ , $\text{K}^+$ , $\text{Ca}^{2+}$ , $\square$ ; Y = $\text{Li}^+$ , $\text{Mg}^{2+}$ , $\text{Fe}^{2+}$ , $\text{Mn}^{2+}$ , $\text{Al}^{3+}$ , $\text{Cr}^{3+}$ , $\text{V}^{3+}$ , $\text{Fe}^{3+}$ ( $\text{Ti}^{4+}$ ); Z = $\text{Mg}^{2+}$ , $\text{Fe}^{2+}$ , $\text{Al}^{3+}$ , $\text{Fe}^{3+}$ , $\text{V}^{3+}$ , $\text{Cr}^{3+}$ ; T = $\text{Si}^{4+}$ , $\text{Al}^{3+}$ ( $\text{B}^{3+}$ ); B = $\text{B}^{3+}$ ; V = $\text{OH}^-$ , $\text{O}^{2-}$ ; W = $\text{OH}^-$ , $\text{F}^-$ , $\text{O}^{2-}$ ) | 144                     |
| <b>Ba-Ca-Cl-F -Fe-Mg-Mn-Na-O -Si-Ti</b>             | $\text{Na}_2\text{O}-0.14$ ; $\text{CaO}-0.50$ ; $\text{BaO}-48.2$ ; $\text{FeO}-5.77$ ; $\text{MgO}-0.16$ ; $\text{MnO}-1.28$ ; $\text{TiO}_2-7.12$ ; $\text{SiO}_2-26.1$ ; $\text{Cl}-4.23$ ; $\text{F}-0.5$ (in wt%)                                                                                                                                                                                                                                                                                                                                                                                                             | 134                     |
| <b>Ba-Ca-Cl-F -H -Mn-O -Si-Ti</b>                   | $\text{Ba}_{10}\text{Ca}_2\text{MnTiSi}_{10}\text{O}_{30}(\text{OH}, \text{Cl}, \text{F})_{10}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 55, 57                  |
| <b>Ba-Ca-Cl-Fe-H -K -Mn-Na-Nb-O -R -Si-Sr-Ti-Zr</b> | $\text{Na}_{16.83}\text{K}_{0.29}\text{Sr}_{0.61}\text{Ba}_{0.04}\text{Ca}_{4.33}\text{Mn}_{1.62}\text{Fe}_{0.15}\text{R}_{0.41}\text{Zr}_{2.88}\text{Ti}_{0.19}\text{Si}_{25.29}\text{Nb}_{0.35}\text{O}_{73.3}\text{Cl}_{0.61}\cdot n\text{H}_2\text{O}$ (R = rare earth element)                                                                                                                                                                                                                                                                                                                                                 | 22                      |
| <b>Ba-Ca-Fe-H -Li-Mg-Na-O -R -Si-Sr-Ti</b>          | $\text{Ba}_{8.1}(\text{Sr}_{1.7}\text{R}_{6.5}\text{Ti}_{0.1})(\text{Ca}_{0.2}\text{Na}_{3.3}\text{Fe}_{3.1}\text{Li}_{0.8}\text{Mg}_{0.1}) - \text{Ti}_{8.1}\text{Si}_{32}\text{O}_{98.7}(\text{OH})_{18.3}$ (R = rare earth element)                                                                                                                                                                                                                                                                                                                                                                                              | 61                      |
| <b>Ba-Ca-O -Si</b>                                  | $\text{BaCa}_2\text{Si}_3\text{O}_9$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 4, 16, 17, 22           |
| <b>Ba-Ce-F -H -Mn-Na-O -Si-Ti</b>                   | $\text{NaBa}_2\text{Ce}_2\text{MnTi}_2\text{Si}_8\text{O}_{26}(\text{F}, \text{OH})\cdot\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 57                      |
| <b>Ba-Ce-Fe-H -Na-O -Si-Ti</b>                      | $\text{NaBa}_2\text{FeTi}_2\text{Ce}_2(\text{SiO}_3)_8\text{O}_2(\text{OH})\cdot\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 57                      |
|                                                     | $\text{NaBa}_2\text{FeTi}_2\text{Ce}_2(\text{SiO}_3)_8\text{O}_2(\text{O}, \text{OH})\cdot\text{H}_2\text{O}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 57                      |

| Element system                       | Chemical formula                                                                                                                                                                                                                                                    | Page                        |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| <b>Ba-Cl-Fe-H -Mn-O -Si-Ti</b>       | $(\text{Mn}_{4.06}\text{Ti}_{1.50}\text{Fe}_{0.29})\text{Ba}_{11.27}\text{Si}_{12}\text{O}_{36}\text{O}_{2.20}\text{Cl}_{8.84}\cdot(\text{H}_2\text{O})_{7.05}$                                                                                                     | 162                         |
| <b>Ba-Cl-Fe-H -O -Si-Ti</b>          | $\text{Ba}_{12}\text{Fe}_2\text{Ti}_6\text{Si}_{12}\text{O}_{54}\text{Cl}_3\cdot 7\text{H}_2\text{O}$                                                                                                                                                               | 126, 129                    |
| <b>Ba-Cl-Fe-Mg-Mn-O -Si-Ti</b>       | BaO-39.3; FeO-6.70; MgO-1.13; MnO-0.40; TiO-11.6; SiO <sub>2</sub> -33.0 Cl-1.95 (in wt%)                                                                                                                                                                           | 62                          |
| <b>Ba-Cl-Fe-Nb-O -Si-Ti</b>          | $\text{Ba}_4(\text{Ti},\text{Fe},\text{Nb})_8\text{O}_{16}(\text{SiO}_3)_4\text{Cl}$                                                                                                                                                                                | 57                          |
|                                      | $\text{Ba}_4\text{Ti}_4(\text{Ti}_{0.48}\text{Nb}_{0.36}\text{Fe}_{0.16})_4\text{ClO}_{16}[\text{Si}_4\text{O}_{12}]$                                                                                                                                               | 61                          |
| <b>Ba-Cl-H -Mn-O -Si</b>             | $\text{Ba}_4\text{Mn}_2\text{Si}_4\text{O}_{12}(\text{OH},\text{H}_2\text{O})_3\text{Cl}_3$                                                                                                                                                                         | 159                         |
| <b>Ba-F -H -Mn-Na-O -Si</b>          | $\text{NaBa}_3(\text{Mn}^{2+},\text{Mn}^{3+})_4[\text{Si}_4\text{O}_{10}(\text{OH})_2][\text{Si}_2\text{O}_7]\text{O}_2\text{F}\cdot\text{H}_2\text{O}$                                                                                                             | 126, 129, 133               |
| <b>Ba-Fe-H -Li-Na-O -R -Si-Sr-Ti</b> | $(\text{Na}_{2.28}\text{Li}_{0.11}\text{Fe}^{2+}_{1.44}\square_{0.17})\square_2\text{Ba}_{4.09}\text{Ti}_{4.00}[\text{O}_{1.27}(\text{OH})_{2.73}]\text{Sr}_{4.01}\text{R}_{0.01}[\text{Si}_4\text{O}_{12}]_4\cdot 1.62\text{H}_2\text{O}$ (R = rare earth element) | 61                          |
| <b>Ba-Fe-H -Na-O -R -Si-Ti</b>       | $\text{NaFe}^{2+}\text{Ba}_2\text{R}_2\text{Ti}_2\text{Si}_8\text{O}_{26}\text{OH}\cdot\text{H}_2\text{O}$ (R = rare earth element)                                                                                                                                 | 61                          |
| <b>Ba-Fe-H -Na-O -Si-Sr-Ti</b>       | $(\text{Na},\text{Fe})_2\text{Ba}_2\text{Sr}_2\text{Ti}_2(\text{SiO}_3)_8(\text{O},\text{OH})_2\cdot\text{H}_2\text{O}$                                                                                                                                             | 57                          |
| <b>Ba-Fe-H -Na-O -Si-Ti-X</b>        | $(\text{Na},\text{Fe}^{2+})_{4-x}(\text{OH})_{2-y}\text{Ba}_4\text{Ti}_4[\text{O}_{4-z}(\text{OH})_z]\text{X}_4\cdot[\text{Si}_4\text{O}_{12}]_4\cdot 2\text{H}_2\text{O}$ (X = rare-earth (R), Sr or Ba)                                                           | 55                          |
| <b>Ba-Fe-H -O -Si-Sr-Ti</b>          | $(\text{Ba},\text{Sr})_4\text{Fe}_2\text{Ti}_2\text{O}_2(\text{SiO}_3)_8\cdot\text{H}_2\text{O}$                                                                                                                                                                    | 57                          |
| <b>Ba-Ge-O</b>                       | $\text{BaGe}_4\text{O}_9$                                                                                                                                                                                                                                           | 3                           |
| <b>Ba-Ge-O -Si-Sn</b>                | $\text{BaSn}(\text{Ge}_{3-x}\text{Si}_x)\text{O}_9$                                                                                                                                                                                                                 | 4, 21                       |
| <b>Ba-H -Mn-Na-O -Si</b>             | SiO <sub>2</sub> -32.09; MnO-13.22; Mn <sub>2</sub> O <sub>3</sub> -10.84; Na <sub>2</sub> O-3.12; BaO-36.73; H <sub>2</sub> O-2.40 (in wt%)                                                                                                                        | 134                         |
| <b>Ba-H -Na-O -Si-Sr-Ti</b>          | $\text{Na}_2\text{Ba}_2\text{Sr}_2\text{Ti}_2(\text{SiO}_3)_8(\text{O},\text{OH})_2\cdot\text{H}_2\text{O}$                                                                                                                                                         | 57                          |
| <b>Ba-H -O -Si-Zr</b>                | $\text{BaZrSi}_3\text{O}_9\cdot 2.4\text{H}_2\text{O}$                                                                                                                                                                                                              | 246                         |
|                                      | $\text{BaZrSi}_3\text{O}_9\cdot 3\text{H}_2\text{O}$                                                                                                                                                                                                                | 242, 244                    |
| <b>Ba-K -O -Si</b>                   | $\text{K}_4\text{BaSi}_3\text{O}_9$                                                                                                                                                                                                                                 | 125                         |
| <b>Ba-Na-O -Si-Ti</b>                | $\text{Ba}_{0.01}\text{Na}_{0.02}\text{Ti}_{1.01}\text{Si}_{2.98}\text{O}_9$                                                                                                                                                                                        | 22                          |
| <b>Ba-Nb-O -Si</b>                   | $\text{Ba}_3\text{Nb}_6\text{Si}_4\text{O}_{26}$                                                                                                                                                                                                                    | 21                          |
| <b>Ba-O -Si</b>                      | $\text{Ba}_2^{[6]}\text{Si}_2^{[4]}\text{Si}_6\text{O}_{18}$                                                                                                                                                                                                        | 1                           |
|                                      | $\text{BaSi}_4\text{O}_9$                                                                                                                                                                                                                                           | 3, 16, 21, 29               |
| <b>Ba-O -Si-Sn</b>                   | $\text{BaSnSi}_3\text{O}_9$                                                                                                                                                                                                                                         | 21                          |
| <b>Ba-O -Si-Sn-Ti</b>                | $\text{BaSnSi}_3\text{O}_9\text{-Ti}^{4+}$                                                                                                                                                                                                                          | 12                          |
|                                      | $\text{BaSn}_{1-x}\text{Ti}_x\text{Si}_3\text{O}_9$                                                                                                                                                                                                                 | 12, 16, 22                  |
| <b>Ba-O -Si-Ta</b>                   | $\text{Ba}_3\text{Ta}_6\text{Si}_4\text{O}_{26}$                                                                                                                                                                                                                    | 21                          |
| <b>Ba-O -Si-Ti</b>                   | $\text{BaTiSi}_3\text{O}_9$                                                                                                                                                                                                                                         | 2, 9, 11, 16, 22-24, 27, 42 |
| <b>Ba-O -Si-Ti-Zr</b>                | $\text{BaZrSi}_3\text{O}_9\text{-Ti}^{4+}$                                                                                                                                                                                                                          | 12                          |
| <b>Ba-O -Si-Zr</b>                   | $\text{BaZrSi}_3\text{O}_9$                                                                                                                                                                                                                                         | 2, 16                       |
| <b>Be-Fe-O -Sc-Si</b>                | $\text{Be}_3(\text{Sc},\text{Fe})_2\text{Si}_6\text{O}_{18}$                                                                                                                                                                                                        | 77, 91                      |

| Element system                             | Chemical formula                                                                                                                                                                                                                                                                         | Page          |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| <b>C -Ca-Ce-H -O -Si-Y</b>                 | $\text{Ca}_2(\text{Y,Ce})_2(\text{SiO}_3)_4(\text{CO}_3) \cdot \text{H}_2\text{O}$                                                                                                                                                                                                       | 57            |
| <b>C -Ca-H -K -Na-O -Si-Y</b>              | $\text{K}_5\text{Na}_5(\text{Y,Ca})_{12}\text{Si}_{28}\text{O}_{70}(\text{OH})_2(\text{CO}_3)_8 \cdot 8\text{H}_2\text{O}$                                                                                                                                                               | 129           |
|                                            | $\text{K}_{10}\text{Na}_{10}(\text{Y,Ca})_{24}(\text{Si}_{56}\text{O}_{140})(\text{OH})_4(\text{CO}_3)_{16} \cdot 16\text{H}_2\text{O}$                                                                                                                                                  | 127           |
|                                            | $\text{K}_{10.40}\text{Na}_{8.68}\text{Y}_{20.92}\text{Ca}_{3.08}\text{Si}_{54.16}\text{O}_{130.10}(\text{OH})_{12.32}(\text{CO}_3)_{16.00}(\text{H}_2\text{O})_{12.48}$                                                                                                                 | 134           |
| <b>C -Ca-H -O -Si</b>                      | $\text{Ca}_7(\text{Si}_6\text{O}_{18})(\text{CO}_3) \cdot 2\text{H}_2\text{O}$                                                                                                                                                                                                           | 5, 16, 18     |
| <b>Ca-Ce-Na-O -P -Si</b>                   | $\text{Na}_{11}(\text{Na,Ca})_2\text{Ca}_2\text{Ce}(\text{SiO}_3)_4(\text{PO}_4)_4$                                                                                                                                                                                                      | 243, 244      |
|                                            | $\text{Na}_{11}(\text{Na,Ca})_2\text{Ca}_2\text{Ce}_{0.67}[\text{Si}_4\text{O}_{12}][\text{PO}_4]$                                                                                                                                                                                       | 246           |
| <b>Ca-Cl-Fe-H -Na-O -Si-Zr</b>             | $\text{Na}_{16}\text{Ca}_6\text{Fe}_3\text{Zr}_3(\text{Si}_3\text{O}_9)_2(\text{Si}_9\text{O}_{27})_2(\text{OH,Cl})_4$                                                                                                                                                                   | 5, 16         |
| <b>Ca-Cl-Fe-Mn-Na-Nb-O -R -Si-Sr-Ti-Zr</b> | $(\text{Na}_{5.45}\text{Ca}_{3.06}\text{Sr}_{0.38}\text{R}_{0.28})(\text{Fe}_{1.15}\text{Mn}_{0.82})(\text{Zr}_{1.62}\text{Nb}_{0.30}\text{Ti}_{0.06})\text{Si}_{12}(\text{O}_{36.33}\text{Cl}_{0.67})$ (R = rare earth element)                                                         | 23            |
| <b>Ca-Cl-H -K -Na-O -Si-Ti-Zr</b>          | $\text{Na}_{4.69}\text{Ca}_{0.13}\text{K}_{0.05}(\text{Zr}_{2.01}\text{Ti}_{0.01})\text{Si}_6\text{O}_{18}[(\text{OH})_{0.60}\text{Cl}_{0.48}] \cdot 3.01\text{H}_2\text{O}$                                                                                                             | 134           |
| <b>Ca-F -Fe-H -K -Li-Mn-Na-O -Si-Ti</b>    | $(\text{K}_{0.85}\text{Na}_{0.10})\text{Li}_{3.00}(\text{Ca}_{6.94}\text{Mn}_{0.04})(\text{Ti}_{1.90}\text{Fe}^{3+}_{0.05})\text{Si}_{12.00}\text{O}_{35.78}(\text{OH})_{1.85}\text{F}_{0.25}$                                                                                           | 62            |
|                                            | $(\text{K,Na})\text{Li}_3\text{Ca}_7(\text{Ti,Fe}^{3+},\text{Mn})_2(\text{Si}_6\text{O}_{18})_2(\text{OH,F})_2$                                                                                                                                                                          | 56            |
| <b>Ca-F -H -K -Li-Na-O -Si-Ti</b>          | $(\text{K,Na})\text{Li}_3\text{Ca}_7\text{Ti}_2(\text{SiO}_3)_{12}(\text{OH,F})_2$                                                                                                                                                                                                       | 57            |
| <b>Ca-F -H -Mn-Na-Nb-O -R -Si-Zr</b>       | $(\text{Na,R})_{15}(\text{Ca,R})_6\text{Mn}_3\text{Zr}_3\text{NbSi}_{25}\text{O}_{74}\text{F}_2 \cdot 2\text{H}_2\text{O}$ (R = rare earth element)                                                                                                                                      | 7, 16         |
| <b>Ca-F -K -Li-O -Si-Ti-Zr</b>             | $\text{KLi}_3\text{Ca}_7(\text{Ti,Zr})_2(\text{SiO}_3)_{12}\text{F}_2$                                                                                                                                                                                                                   | 57, 61        |
| <b>Ca-Fe-H -Hf-K -Mn-Na-O -Si-Ti-Zr</b>    | $[\text{Na}_{1.54}\text{K}_{0.01}(\text{H}_2\text{O})_{0.45}]\text{Na}_{0.78}(\text{Na}_{0.19}\text{Mn}^{2+}_{0.14}\text{Ca}_{0.01}\text{Fe}^{2+}_{0.01})(\text{Zr}_{0.96}\text{Ti}_{0.01}\text{Hf}_{0.01})(\text{Si}_6\text{O}_{12}(\text{OH})_3)\{(\text{OH})_{2.24}\text{O}_{0.76}\}$ | 134           |
| <b>Ca-Fe-H -K -Li-Mn-Na-Nb-O -Si-Zn-Zr</b> | $(\text{K}_{1.23}\text{Na}_{1.08}\text{Ca}_{0.11}\text{Li}_{0.58})\text{Li}_{0.73}(\text{Zn}_{1.10}\text{Mn}_{1.31})(\text{Zr}_{0.46}\text{Fe}_{0.26}\text{Nb}_{0.07})\text{Si}_{12}(\text{O,OH})_{30}$                                                                                  | 230           |
| <b>Ca-Fe-H -K -Mg-Mn-Na-O -Si-Sr</b>       | $(\text{Na}_{3.16}\text{Ca}_{0.46}\text{K}_{0.11}\text{Sr}_{0.01})(\text{Mn}^{2+}_{4.45}\text{Fe}^{2+}_{0.42}\text{Mg}_{0.02})\text{Si}_{10}\text{O}_{24}(\text{OH}_{5.60}\text{O}_{0.40}) \cdot 5.59\text{H}_2\text{O}$                                                                 | 134           |
| <b>Ca-Fe-H -Mn-Na-O -Si-Ti</b>             | $\text{H}_3\text{Na}_3(\text{Mn,Ca,Fe})\text{TiSi}_6(\text{O,OH})_{18} \cdot 2\text{H}_2\text{O}$                                                                                                                                                                                        | 126, 129      |
|                                            | $\text{Na}_{3.00}\text{H}_{3.00}(\text{Mn}_{0.54}\text{Ca}_{0.30}\text{Fe}_{0.16})(\text{Ti}_{0.72}\text{Fe}_{0.28})\text{Si}_6[\text{O}_{17.40}(\text{OH})_{0.60}] \cdot 2.23\text{H}_2\text{O}$                                                                                        | 134           |
| <b>Ca-Fe-Mg-Mn-Na-O -Si-Zn</b>             | $\text{Na}_{2.4}\text{Ca}_{1.5}(\text{Fe,Mn,Mg,Zn})_{0.3}\text{Si}_3\text{O}_9$                                                                                                                                                                                                          | 134           |
| <b>Ca-Fe-Mn-Na-O -Si-Ti</b>                | $\text{Na}_6(\text{Ca,Mn})(\text{Fe,Ti})[\text{Si}_6\text{O}_{18}]$                                                                                                                                                                                                                      | 124, 129, 133 |
| <b>Ca-Fe-Na-O -Si</b>                      | $\text{Na}_6\text{Ca}_{1.5}\text{Fe}[\text{Si}_6\text{O}_{18}]$                                                                                                                                                                                                                          | 124, 129, 133 |
|                                            | $\text{Na}_{12}\text{Ca}_3\text{Fe}_2\text{Si}_{12}\text{O}_{36}$                                                                                                                                                                                                                        | 129           |
| <b>Ca-H -K -Na-O -Si-Zr</b>                | $\text{Na}_{1.85}\text{K}_{0.05}\text{Ca}_{0.02}\text{Zr}_{1.03}\text{Si}_{2.99}\text{O}_9 \cdot 3.21\text{H}_2\text{O}$                                                                                                                                                                 | 246           |
| <b>Ca-H -Mn-O -Pb-S -Si</b>                | $\text{Ca}_6\text{MnPb}_2(\text{Si}_3\text{O}_9)_2(\text{SO}_4)_2(\text{OH})_2 \cdot 4\text{H}_2\text{O}$                                                                                                                                                                                | 4, 16, 22     |
| <b>Ca-H -Na-O -Si-Ti-Zr</b>                | $(\text{Na,Ca})_3(\text{Zr,Ti})\text{Si}_6(\text{O,OH})_{18}$                                                                                                                                                                                                                            | 129, 133      |
| <b>Ca-H -Na-O -Si-Zr</b>                   | $\text{NaCa}_9\text{Zr}_4\text{Si}_{16}\text{O}_{40}(\text{OH})_{11} \cdot 8\text{H}_2\text{O}$                                                                                                                                                                                          | 16            |
| <b>Ca-H -O -Si-Zr</b>                      | $\text{CaZrSi}_3\text{O}_9 \cdot \text{H}_2\text{O}$                                                                                                                                                                                                                                     | 16            |
|                                            | $\text{CaZrSi}_3\text{O}_9 \cdot 2\text{H}_2\text{O}$                                                                                                                                                                                                                                    | 7             |

| Element system                    | Chemical formula                                                                                                                                                                                                                                | Page                                                                     |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| <b>Ca-H -O -Si-Zr (cont.)</b>     | $\text{CaZrSi}_3\text{O}_9 \cdot 3\text{H}_2\text{O}$                                                                                                                                                                                           | 242, 244                                                                 |
| <b>Ca-K -Mn-Na-O -P -R -Si-Sr</b> | [wt %]: $\text{P}_2\text{O}_5$ -25.53; $\text{SiO}_2$ -20.1; $\text{R}_2\text{O}_3$ -0.18;<br>$\text{CaO}$ -15.65; $\text{SrO}$ -3.08; $\text{MnO}$ -0.60; $\text{Na}_2\text{O}$ -32.55;<br>$\text{K}_2\text{O}$ -0.09 (R = rare earth element) | 246                                                                      |
|                                   | [wt %]: $\text{P}_2\text{O}_5$ -25.5; $\text{SiO}_2$ -20.1; $\text{R}_2\text{O}_3$ -0.44; $\text{CaO}$ -<br>16.45; $\text{SrO}$ -1.91; $\text{MnO}$ -0.54; $\text{Na}_2\text{O}$ -32.7; $\text{K}_2\text{O}$ -<br>0.05 (R = rare earth element) | 246                                                                      |
| <b>Ca-K -Na-O -P -Si</b>          | $(\text{Ca}_{3.78}\text{Na}_{0.06}\text{K}_{0.06})(\text{Si}_{1.58}\text{P}_{0.40})\text{O}_8$                                                                                                                                                  | 246                                                                      |
| <b>Ca-K -O -Si</b>                | $\text{K}_4\text{CaSi}_3\text{O}_9$                                                                                                                                                                                                             | 125                                                                      |
| <b>Ca-Mn-O -Pb-Si</b>             | $\text{Pb}_{2.04}\text{Ca}_{4.06}\text{Mn}_{0.17}\text{Si}_{5.87}\text{O}_{18.01}$                                                                                                                                                              | 22                                                                       |
| <b>Ca-Na-Nd-O -Si</b>             | $\text{Na}_5(\text{Na},\text{Ca})_2(\text{Nd},\text{Ca})_2[\text{Si}_6\text{O}_{18}]$                                                                                                                                                           | 124, 129, 133                                                            |
|                                   | $\text{Na}_5(\text{Na}_{0.5+x}\text{Ca}_{0.5-x})_2(\text{Nd}_x\text{Ca}_{1-x})_2[\text{Si}_6\text{O}_{18}]$                                                                                                                                     | 125, 134                                                                 |
| <b>Ca-Na-O -P -Si</b>             | $\text{Na}_3\text{Ca}[\text{SiO}_3](\text{PO}_4)$                                                                                                                                                                                               | 243, 244                                                                 |
| <b>Ca-Na-O -Si</b>                | $\text{Na}_{2.2}\text{Ca}_{1.9}\text{Si}_3\text{O}_9$                                                                                                                                                                                           | 134                                                                      |
|                                   | $\text{Na}_4\text{CaSi}_3\text{O}_9$                                                                                                                                                                                                            | 125, 129, 133                                                            |
|                                   | $\text{Na}_4\text{Ca}_4[\text{Si}_6\text{O}_{18}]$                                                                                                                                                                                              | 124, 125, 129, 130, 133                                                  |
|                                   | $\text{Na}_6\text{Ca}_3[\text{Si}_6\text{O}_{18}]$                                                                                                                                                                                              | 124, 125, 129, 133                                                       |
| <b>Ca-Na-O -Si-Zr</b>             | $\text{Na}_6\text{CaZrSi}_6\text{O}_{18}$                                                                                                                                                                                                       | 123, 129, 133                                                            |
| <b>Ca-O -P -Si</b>                | $\text{Ca}_7(\text{SiO}_4)_2(\text{PO}_4)_2$                                                                                                                                                                                                    | 243, 244                                                                 |
| <b>Ca-O -Pb-Si</b>                | $\text{Ca}_2\text{PbSi}_3\text{O}_9$                                                                                                                                                                                                            | 4, 16                                                                    |
| <b>Cd-Na-O -Si</b>                | $\text{Na}_6\text{Cd}_3[\text{Si}_6\text{O}_{18}]$                                                                                                                                                                                              | 123, 124, 127, 129, 133                                                  |
| <b>Cl-H -Na-O -Si-Zr</b>          | $\text{Na}_5\text{Zr}_2\text{Si}_6\text{O}_{18}(\text{Cl},\text{OH}) \cdot 2\text{H}_2\text{O}$                                                                                                                                                 | 127, 129                                                                 |
| <b>Cu-Ge-O</b>                    | $\text{CuGeO}_{2.9}$                                                                                                                                                                                                                            | 207                                                                      |
|                                   | $\text{CuGeO}_3$                                                                                                                                                                                                                                | 186, 188, 189, 191, 192,<br>194, 195, 204                                |
| <b>Cu-Ge-O -Si</b>                | $\text{CuGe}_{1-x}\text{Si}_x\text{O}_3$                                                                                                                                                                                                        | 184, 186, 188-194, 196,<br>202, 207-213, 215                             |
| <b>Cu-H -O -Si</b>                | $\text{Cu}_6[\text{Si}_6\text{O}_{18}] \cdot 6\text{H}_2\text{O}$                                                                                                                                                                               | 184, 185, 187, 190-193,<br>195-197, 200, 204, 205,<br>209, 211, 213, 214 |
|                                   | $\text{Cu}_6\text{Si}_6\text{O}_{18}(\text{H}_2\text{O})_{6-6x}\square_{6x}$                                                                                                                                                                    | 201                                                                      |
| <b>Cu-K -Mg-Na-O -Si</b>          | $\text{NaKMg}_3\text{Cu}_2\text{Si}_{12}\text{O}_{30}$                                                                                                                                                                                          | 229                                                                      |
| <b>Cu-K -Mg-O -Si</b>             | $\text{K}_2\text{Mg}_3\text{Cu}_2\text{Si}_{12}\text{O}_{30}$                                                                                                                                                                                   | 229                                                                      |
| <b>Cu-M -O</b>                    | $\text{CuMO}_3$ (M = Ge, Si)                                                                                                                                                                                                                    | 204                                                                      |
| <b>Cu-Mg-Na-O -Rb-Si</b>          | $\text{RbNaMg}_3\text{Cu}_2\text{Si}_{12}\text{O}_{30}$                                                                                                                                                                                         | 229                                                                      |
| <b>Cu-Mg-Na-O -Si</b>             | $\text{Na}_2\text{Mg}_3\text{Cu}_2\text{Si}_{12}\text{O}_{30}$                                                                                                                                                                                  | 229                                                                      |
| <b>Cu-O -Si</b>                   | $\text{CuSiO}_3$                                                                                                                                                                                                                                | 186, 188, 190-193, 195,<br>196, 203, 204, 206, 207,<br>210               |
|                                   | $\text{Cu}_6\text{Si}_6\text{O}_{18}$                                                                                                                                                                                                           | 184, 185, 187, 190, 193,<br>196, 204                                     |

| Element system                       | Chemical formula                                                                                                                                                                                            | Page                  |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| <b>Fe-H -K -Mn-Na-O -Si</b>          | $(\text{Na}, \text{K})_6(\text{Mn}, \text{Fe})_3\text{Si}_9\text{O}_{24} \cdot 6\text{H}_2\text{O}$                                                                                                         | 126, 129              |
| <b>Fe-H -K -Na-O -Si-Ti-Zr</b>       | $\text{Na}_{1.02}\text{K}_{0.96}(\text{Zr}_{0.99}\text{Ti}_{0.01}\text{Fe}_{0.01})(\text{Si}_{3.01}\text{O}_9) \cdot 2.14\text{H}_2\text{O}$                                                                | 23                    |
| <b>Fe-K -Mg-Mn-Na-O -Si-Ti</b>       | $\text{Na}_{1.15}\text{K}_{1.0}(\text{Mg}_{4.66}\text{Fe}_{0.12}\text{Mn}_{0.10}\text{Ti}_{0.01})\text{Si}_{12}\text{O}_{30}$                                                                               | 230                   |
| <b>Fe-K -Mg-Mn-O -Si</b>             | $\text{K}(\text{Mg}, \text{Fe}^{2+})_2[(\text{Mn}, \text{Fe}^{2+})_2\text{Fe}^{3+}\text{Si}_{12}\text{O}_{30}]$                                                                                             | 225                   |
| <b>Fe-K -Mg-Na-O -Si</b>             | $(\text{Na}, \text{K})_2(\text{Mg}, \text{Fe})_5\text{Si}_{12}\text{O}_{30}$                                                                                                                                | 220, 225              |
| <b>Fe-K -Mg-O -Si</b>                | $\text{K}(\text{Mg}^{2+}, \text{Fe}^{2+})_4\text{Fe}^{3+}\text{Si}_{12}\text{O}_{30}$                                                                                                                       | 220                   |
|                                      | $\text{K}_2\text{Mg}_3\text{Fe}_2\text{Si}_{12}\text{O}_{30}$                                                                                                                                               | 229                   |
| <b>Fe-Mg-Na-O -Rb-Si</b>             | $\text{RbNaMg}_3\text{Fe}_2\text{Si}_{12}\text{O}_{30}$                                                                                                                                                     | 229                   |
| <b>Fe-Mg-Na-O -Si</b>                | $\text{Na}_2\text{Mg}_3\text{Fe}_2\text{Si}_{12}\text{O}_{30}$                                                                                                                                              | 229                   |
| <b>Ge-K -O</b>                       | $\text{K}_2\text{GeGe}_3\text{O}_3$                                                                                                                                                                         | 3                     |
| <b>Ge-K -O -Si-Ta</b>                | $\text{KTa}(\text{Ge}_{3-x}\text{Si}_x)\text{O}_9$                                                                                                                                                          | 4, 21                 |
| <b>Ge-K -O -Sr</b>                   | $\text{K}_4\text{SrGe}_3\text{O}_9$                                                                                                                                                                         | 125                   |
| <b>Ge-O -Rb-Si-Ta</b>                | $\text{RbTa}(\text{Ge}_{3-x}\text{Si}_x)\text{O}_9$                                                                                                                                                         | 4, 21                 |
| <b>Ge-O -Si-Ta-Tl</b>                | $\text{TlTa}(\text{Ge}_{3-x}\text{Si}_x)\text{O}_9$                                                                                                                                                         | 4, 21                 |
| <b>Ge-O -Sr</b>                      | $\text{SrGe}_4\text{O}_9$                                                                                                                                                                                   | 3, 29                 |
| <b>H -K -Mn-O -Si</b>                | $\text{K}_2\text{Mn}_5\text{Si}_{12}\text{O}_{30} \cdot \text{H}_2\text{O}$                                                                                                                                 | 219                   |
| <b>H -K -Na-Nb-O -R -Si-Ti-Y -Zr</b> | $\text{Na}_2(\text{Na}_{2.4}\text{K}_{0.6})[(\text{Zr}_{0.7}\text{Ti}_{0.2}\text{Nb}_{0.1})(\text{Y}_{0.8}\text{R}_{0.2}) - (\text{Si}_6\text{O}_{18})] \cdot 6\text{H}_2\text{O}$ (R = rare earth element) | 246                   |
| <b>H -K -Na-Nb-O -Si-Ti-Zr</b>       | $(\text{Na}_{1.72}\text{K}_{0.19})(\text{Zr}_{1.00}\text{Nb}_{0.09}\text{Ti}_{0.02})\text{Si}_{2.88}\text{O}_9 \cdot 10\text{H}_2\text{O}$                                                                  | 23                    |
| <b>H -K -Na-O -Si-Zr</b>             | $\text{NaKZrSi}_3\text{O}_9 \cdot 2\text{H}_2\text{O}$                                                                                                                                                      | 8, 16                 |
| <b>H -Mn-Na-O -Si</b>                | $\text{Na}_4\text{Mn}_5\text{Si}_{10}\text{O}_{24}(\text{OH})_6 \cdot 6\text{H}_2\text{O}$                                                                                                                  | 126, 129              |
| <b>H -Mn-Na-O -Si-Zr</b>             | $(\text{Na}, \text{H}_2\text{O}, \square)_3(\square, \text{Na}, \text{Mn}^{2+})\text{Zr}[\text{Si}_6\text{O}_{12}(\text{OH})_3 - (\text{OH}, \text{O})_3]$                                                  | 125, 129              |
| <b>H -Na-O -Si-Zr</b>                | $\text{H}_5\text{Na}_3\text{Zr}[\text{Si}_6\text{O}_{18}]$                                                                                                                                                  | 129, 133              |
|                                      | $\text{H}_6\text{Na}_2\text{Zr}[\text{Si}_6\text{O}_{18}]$                                                                                                                                                  | 123, 129, 133         |
|                                      | $\text{Na}_2\text{ZrSi}_3\text{O}_9 \cdot \text{H}_2\text{O}$                                                                                                                                               | 7                     |
|                                      | $\text{Na}_2\text{ZrSi}_3\text{O}_9 \cdot 2\text{H}_2\text{O}$                                                                                                                                              | 2, 8, 16, 20, 23, 242 |
|                                      | $\text{Na}_2\text{ZrSi}_3\text{O}_9 \cdot 3\text{H}_2\text{O}$                                                                                                                                              | 244, 246              |
| <b>K -Li-Mg-O -Si</b>                | $\text{K}_3\text{Mg}_4\text{LiSi}_{12}\text{O}_{30}$                                                                                                                                                        | 229                   |
| <b>K -Li-Mn-Na-O -Si-Zn-Zr</b>       | $\text{KNa}_2\text{Zr}[\text{Li}(\text{Mn}, \text{Zn})_2\text{Si}_{12}\text{O}_{30}]$                                                                                                                       | 225                   |
| <b>K -Li-O -Si-Sn</b>                | $\text{KSn}_2\text{Li}_3\text{Si}_{12}\text{O}_{30}$                                                                                                                                                        | 225, 230              |
| <b>K -M -O -Si</b>                   | $\text{K}_6\text{M}_6\text{Si}_4\text{O}_{26}$ (M = Nb, Ta)                                                                                                                                                 | 4, 16                 |
| <b>K -Mg-Na-O -Si</b>                | $(\text{K}_{1-x}\text{Na}_x)_2\text{Mg}_5\text{Si}_{12}\text{O}_{30}$                                                                                                                                       | 222, 235              |
|                                      | $\text{KNaMg}_5\text{Si}_{12}\text{O}_{30}$                                                                                                                                                                 | 222, 229              |
|                                      | $\text{KNa}_2\text{Mg}_{4.5}\text{Si}_{12}\text{O}_{30}$                                                                                                                                                    | 230                   |
|                                      | $\text{KNa}_3\text{Mg}[\text{Mg}_3\text{Si}_{12}\text{O}_{30}]$                                                                                                                                             | 225                   |
| <b>K -Mg-O -Si</b>                   | $\text{K}_2\text{Mg}_5\text{Si}_{12}\text{O}_{30}$                                                                                                                                                          | 220, 222, 225, 229    |
| <b>K -Mg-O -Si-Zn</b>                | $\text{K}_2\text{Mg}_3\text{Zn}_2\text{Si}_{12}\text{O}_{30}$                                                                                                                                               | 229                   |
| <b>K -Nb-O -Si</b>                   | $\text{K}_6\text{Nb}_6\text{Si}_4\text{O}_{26}$                                                                                                                                                             | 21                    |

| Element system        | Chemical formula                 | Page                                                |
|-----------------------|----------------------------------|-----------------------------------------------------|
| <b>K -O -Si</b>       | $K_2Si_4O_9$                     | 2, 3, 9, 10, 13, 14, 16, 17, 21, 23, 39, 41, 46, 48 |
|                       | $K_4^{[6]}Si_2^{[4]}Si_6O_{18}$  | 1                                                   |
| <b>K -O -Si-Ta</b>    | $K_6Ta_6Si_4O_{26}$              | 21                                                  |
| <b>K -O -Si-Ti</b>    | $K_2TiSi_3O_9$                   | 9, 13, 21, 23                                       |
| <b>K -O -Si-Zr</b>    | $K_2ZrSi_3O_9$                   | 1, 13, 16, 22                                       |
| <b>Li-Mg-Na-O -Si</b> | $Na_3Mg_4LiSi_{12}O_{30}$        | 229                                                 |
| <b>Mg-Na-O -Rb-Si</b> | $RbNaMg_5Si_{12}O_{30}$          | 229                                                 |
| <b>Mg-Na-O -Si</b>    | $Na_2Mg_5Si_{12}O_{30}$          | 222, 223, 229, 230                                  |
| <b>Mg-Na-O -Si-Zn</b> | $Na_2Mg_3Zn_2Si_{12}O_{30}$      | 229                                                 |
| <b>Mn-Na-O -Si</b>    | $Na_5(Na,Mn)_3Mn[Si_6O_{18}]$    | 123, 124, 129, 133                                  |
|                       | $Na_6Mn_3[Si_6O_{18}]$           | 124, 129, 133                                       |
| <b>Mn-Na-O -Si-Ti</b> | $Na_6MnTiSi_6O_{18}$             | 123, 129, 133                                       |
| <b>Na-O -Si</b>       | $Na_2Si_4O_9$                    | 2, 3, 9, 10, 14, 16, 21, 23, 40, 41, 47             |
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