Table DS1. Sample location and mineral composition

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Samples | Localities | Location | sample type | Main components | Accessory phases |
| C-12, C-14, C-17, C-18\* PrCe-1 | El Cebollar | 30S 464618/4093920 | Biotite gneiss | Qz?, Abi,m, WMm,, Bt, Grtm,r | Apr, Epi,m,r, Ttnm, Rt?, Ilmm, Zrni,r, Amm |
| C-13, C-15 C-16, C-19 |  |  | meta-cinerites | Qz?, Abm, Kfsi, WMm,r | Apr, Epi,m,r, Ttnm, Rt?, Ilmm, Zrni,r |
| C-11 and C-20 |  |  | Chl-schists | Qzd,m, Plm, Chlm, WMm, Prgm, Btm | Kfsd, Rt?, Ilmm, Zrnd,m |
| CE-5 to CE-7 | Las Alegas | 30S 0465017/ 4094272 | Leucocratic gneisses | Qz?, Abm, Kfsi, WMm,r | Turi, Btr,m, Apr, Epi,m,r, Ttnm, Rt?, Ilmm, Zrni,m |
| CE-8 |  |  | meta-cinerite | Qz?, Abm, Kfsi, WMm,r, Btm | Apr, Ttnm, Rt?, Ilmm, Zrni,r |
| CE-9 and CE-10 |  |  | Grt-Pg schists | Qzd,m, Abm, WMm, Pgm, Btm, Grtm | Apd, Epd, Ttnd,m, Rt?, Ilmm, Zrnd,m |
| EP-4, EP-5, EP-12 | Los Pelaos | 30S 46496496/4091361 | Leucocratic gneisses | Qz?, Abm, Kfsi, WMm,r | Turi, Btr,m, Apr, Epr,m, Ttnr,m, Rt?, Zrni,r, Grtm, Amm |
| EP-7, Pe-01 |  |  | Eclogites | Amm, Abm, Epi,m, Grtm, Ompm, Qzm, Btm, WMm | Ttni,m, Rt, Apcc, Zrnc,m, Cal |
| EP-6, EP-8, EP-11 |  |  | Grt-Pg schists | Qzd,m, Abm, WMm, Pgm, Btm, Grtm | Apd, Epd, Ttnd,m, Rt?, Ilmm, Zrnd,m |
| CE-1 to CE-4 |  |  | Calc-schists | Qzd,m, Calm, Pld,m, WMm, Pgm, Epm | Kfsd, Btm, Ttnm, Rt?, Ilmm, Zrnd,m |
| EP-3 | Pista Soportújar | 30S465311/4091327 | Leucocratic gneisses | Qz?, Abm, Kfsi, WMm,r | Turi, Btr,m, Apr, Ep m, Ttnr,m, Rt?, Zrni,r |
| EP-1 and EP-2 |  |  | Grt-Pg schsists | Qzd,m, Abm, WMm, Pgm, Btm, Grtm | Apd, Epd, Ttnd,m, Rt?, Ilmm, Zrnd,m |

Superscript symbols: i: igneous; m: metamorphic; r: pre-Alpine; c: cc: crustal contamination; ?: undetermined; d: detrital.

Table DS2. Bulk-rock composition

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Biotite gneiss | | | | Leucocratic gneiss | | | | Cinerite | | Eclogites Micaschists | | | | | | Calcschists | | Chl-schist |
|  | C-12\* | C-14 | C-17 | C-18 | EP-3 | EP-4 | EP-5\* | EP-12 | C-16 | EP-7\* | | PE-01 | EP-1 | EP-6\* | EP-8 | EP-9 | CE-2 | CE-1 | C-20 |
| SiO2 | 69.3 | 70.24 | 68.61 | 69.00 | 74.79 | 75.51 | 74.89 | 75.06 | 71.31 | 48.62 | | 42.36 | 63.12 | 64.77 | 62.01 | 54.86 | 49.66 | 64.3 | 66.15 |
| TiO2 | 0.56 | 0.58 | 0.60 | 0.77 | 0.12 | 0.12 | 0.16 | 0.30 | 0.26 | 2.27 | | 1.47 | 0.94 | 0.87 | 0.92 | 0.97 | 0.51 | 0.66 | 0.98 |
| Al2O3 | 15.1 | 14.91 | 15.19 | 14.39 | 13.94 | 13.36 | 13.89 | 13.01 | 14.48 | 16.32 | | 15.06 | 19.10 | 18.52 | 18.23 | 21.82 | 10.23 | 15.28 | 16.5 |
| Fe2O3 | 3.86 | 3.89 | 4.35 | 4.62 | 1.41 | 1.45 | 1.51 | 2.01 | 2.45 | 12.59 | | 8.83 | 7.64 | 5.60 | 7.47 | 7.78 | 4.16 | 5.55 | 5.81 |
| MnO | 0.05 | 0.06 | 0.07 | 0.06 | 0.02 | 0.02 | 0.02 | 0.02 | 0.11 | 0.22 | | 0.14 | 0.13 | 0.07 | 0.29 | 0.06 | 0.08 | 0.09 | 0.03 |
| MgO | 1.03 | 0.97 | 1.03 | 1.09 | 0.14 | 0.12 | 0.22 | 0.92 | 0.41 | 4.89 | | 2.83 | 1.58 | 1.48 | 1.89 | 2.01 | 0.65 | 0.81 | 1.82 |
| CaO | 1.05 | 1.1 | 1.05 | 1.05 | 0.44 | 0.43 | 0.46 | 0.58 | 0.74 | 9.60 | | 19.53 | 0.78 | 0.94 | 1.98 | 1.67 | 18.12 | 5.91 | 0.33 |
| Na2O | 1.96 | 0.75 | 1.28 | 1.16 | 2.64 | 2.97 | 2.35 | 2.42 | 1.92 | 3.15 | | 0.98 | 0.55 | 0.52 | 0.96 | 2.31 | 0.4 | 0.73 | 0.59 |
| K2O | 4.67 | 5.04 | 4.58 | 4.38 | 4.54 | 4.47 | 5.09 | 4.06 | 4.89 | 0.46 | | 0.07 | 3.39 | 4.32 | 3.02 | 4.82 | 2.26 | 2.79 | 3.06 |
| P2O5 | 0.19 | 0.19 | 0.21 | 0.24 | 0.26 | 0.24 | 0.23 | 0.24 | 0.24 | 0.18 | | 0.19 | 0.10 | 0.12 | 0.14 | 0.16 | 0.11 | 0.16 | 0.15 |
| Zr (ppm) | 206 | 225 | 215.3 | 259.40 | 46.3 | 59.5 | 103.2 | 110.5 | 112 | 162.5 | | 121.4 | 192.3 | 215.0 | 231 | 187 | 154.7 | 188.4 | 231.5 |
| LOI | 1.7 | 2.09 | 1.90 | 1.74 | 1.04 | 0.88 | 0.95 | 1.13 | 1.28 | 1.07 | | 8.16 | 2.42 | 2.54 | 2.84 | 2.87 | 13.32 | 3.39 | 3.71 |
| Total | 99.47 | 99.82 | 98.87 | 98.50 | 99.34 | 99.57 | 99.77 | 99.75 | 98.09 | 99.37 | | 99.62 | 99.74 | 99.75 | 99.75 | 99.33 | 99.5 | 99.67 | 99.13 |

\*Samples used for P-T pseudosections

Table DS3. Representative EMPA data for feldspars

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Leucocratic gneiss | | |  | | Biotite gneiss | | | | | Schist | | Eclogite |
|  | Pl | Pl | Kfs |  | Pl | | Pl | Pl | Kfs |  | Pl | Pl | |
|  | core | rim |  |  | core | | rim | rim |  |  |  |  | |
| SiO2 | 68.27 | 68.37 | 65.00 |  | 68.75 | | 68.81 | 67.99 | 65.52 |  | 65.13 | 67.68 | |
| TiO2 | 0.01 | 0.04 | 0.00 |  | 0.00 | | 0.00 | 0.00 | 0.00 |  | 0.00 | 0.00 | |
| Al2O3 | 19.54 | 19.73 | 18.76 |  | 19.33 | | 19.45 | 19.76 | 18.34 |  | 21.25 | 20.59 | |
| Cr2O3 | 0.01 | 0.00 | 0.00 |  | 0.00 | | 0.00 | 0.00 | 0.00 |  | 0.00 | 0.00 | |
| FeO | 0.03 | 0.06 | 0.00 |  | 0.08 | | 0.08 | 0.02 | 0.00 |  | 0.02 | 0.00 | |
| MnO | 0.00 | 0.02 | 0.03 |  | 0.03 | | 0.00 | 0.01 | 0.00 |  | 0.02 | 0.00 | |
| MgO | 0.00 | 0.00 | 0.00 |  | 0.01 | | 0.00 | 0.00 | 0.00 |  | 0.00 | 0.00 | |
| CaO | 0.07 | 0.03 | 0.00 |  | 0.22 | | 0.32 | 0.65 | 0.00 |  | 2.57 | 0.88 | |
| Na2O | 11.63 | 11.76 | 0.61 |  | 11.54 | | 11.53 | 11.40 | 0.70 |  | 9.93 | 11.22 | |
| K2O | 0.06 | 0.14 | 15.58 |  | 0.10 | | 0.09 | 0.10 | 15.32 |  | 0.42 | 0.05 | |
| Total | 99.73 | 100.19 | 99.98 |  | 100.06 | | 100.28 | 99.93 | 99.88 |  | 99.54 | 100.42 | |
| Formulae calculated for 8 oxygens | | | | | | | | | | | | | |
| Si | 2.993 | 2.979 | 3.005 |  | 3.001 | | 2.997 | 2.981 | 3.013 |  | 2.887 | 2.951 | |
| Ti | 0.000 | 0.001 | 0.000 |  | 0.000 | | 0.000 | 0.000 | 0.000 |  | 0.000 | 0.000 | |
| Al | 1.010 | 1.013 | 1.021 |  | 0.994 | | 0.999 | 1.010 | 0.996 |  | 1.110 | 1.053 | |
| Fe | 0.001 | 0.002 | 0.000 |  | 0.001 | | 0.000 | 0.000 | 0.000 |  | 0.001 | 0.000 | |
| Mn | 0.000 | 0.001 | 0.001 |  | 0.000 | | 0.000 | 0.000 | 0.000 |  | 0.001 | 0.000 | |
| Mg | 0.000 | 0.000 | 0.000 |  | 0.001 | | 0.000 | 0.000 | 0.000 |  | 0.000 | 0.000 | |
| Ca | 0.003 | 0.001 | 0.000 |  | 0.010 | | 0.015 | 0.030 | 0.000 |  | 0.122 | 0.035 | |
| Na | 0.988 | 0.994 | 0.055 |  | 0.977 | | 0.974 | 0.963 | 0.063 |  | 0.853 | 0.965 | |
| K | 0.004 | 0.008 | 0.918 |  | 0.006 | | 0.005 | 0.006 | 0.898 |  | 0.024 | 0.003 | |
|  |  |  |  |  |  | |  |  |  |  |  |  | |
| An | 0.3 | 0.1 | 0.0 |  | 1.2 | | 1.5 | 3.0 | 1.2 |  | 12.2 | 3.5 | |
| Ab | 99.3 | 99.1 | 5.7 |  | 98.2 | | 98.0 | 96.4 | 0.7 |  | 85.4 | 96.2 | |
| Or | 0.4 | 0.8 | 94.3 |  | 0.6 | | 0.5 | 0.6 | 98.1 |  | 2.4 | 0.3 | |

Table DS4. Representative EMPA data for biotite

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Biotite gneiss | | | | | | | Leucocratic gneiss | | | Eclogite |
|  |  | | alteration of garnet and matrix | | | | | foliation |  | from garnet | matrix |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| SiO2 | 35.99 | 35.40 | 34.56 | 35.09 | 34.95 | 35.08 | 34.51 | 37.93 | 36.78 | 33.63 | 37.71 |
| TiO2 | 1.46 | 1.67 | 1.22 | 1.30 | 1.23 | 1.12 | 0.91 | 0.99 | 0.72 | 0.64 | 3.04 |
| Al2O3 | 18.16 | 17.24 | 17.75 | 17.44 | 17.64 | 17.36 | 17.85 | 17.14 | 16.52 | 18.18 | 17.58 |
| Cr2O3 | 0.01 | 0.00 | 0.00 | 0.00 | 0.06 | 0.02 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 |
| FeO | 23.12 | 23.72 | 25.58 | 24.45 | 25.34 | 24.49 | 24.86 | 22.11 | 20.76 | 29.12 | 18.18 |
| MnO | 0.18 | 0.16 | 0.22 | 0.23 | 0.19 | 0.18 | 0.26 | 0.26 | 0.38 | 0.92 | 0.09 |
| MgO | 6.05 | 6.58 | 5.78 | 6.08 | 5.77 | 5.75 | 5.47 | 8.46 | 8.15 | 0.66 | 10.61 |
| CaO | 1.45 | 0.08 | 0.10 | 0.15 | 0.10 | 0.20 | 0.83 | 0.04 | 0.06 | 0.20 | 0.31 |
| Na2O | 0.02 | 0.01 | 0.02 | 0.03 | 0.00 | 0.05 | 0.06 | 0.04 | 0.03 | 0.44 | 0.35 |
| K2O | 7.95 | 8.43 | 8.72 | 8.60 | 8.76 | 8.40 | 8.03 | 9.25 | 9.20 | 8.77 | 6.95 |
| P2O5 | 0.00 | 0.07 | 0.01 | 0.00 | 0.02 | 0.01 | 0.03 | 0.01 | 0.00 | 0.01 | 0.01 |
| F | 0.12 | 0.11 | 0.16 | 0.09 | 0.04 | 0.17 | 0.13 | 1.11 | 0.86 | 0.18 | 0.00 |
| Cl | 0.61 | 0.60 | 0.71 | 0.95 | 1.02 | 0.95 | 0.95 | 0.05 | 0.03 | 0.17 | 0.02 |
| Total | 94.98 | 93.98 | 94.62 | 94.16 | 94.91 | 93.48 | 93.63 | 96.92 | 93.18 | 92.81 | 94.85 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Formulae calculated for O10(OH)2 | | | | | | | | | | | |
| Si | 2.799 | 2.801 | 2.750 | 2.790 | 2.774 | 2.810 | 2.767 | 2.878 | 2.897 | 2.787 | 2.817 |
| IVAl | 1.201 | 1.199 | 1.250 | 1.210 | 1.226 | 1.190 | 1.233 | 1.122 | 1.103 | 1.213 | 1.183 |
| VIAl | 0.464 | 0.408 | 0.415 | 0.424 | 0.425 | 0.449 | 0.454 | 0.412 | 0.431 | 0.564 | 0.364 |
| Ti | 0.086 | 0.100 | 0.073 | 0.078 | 0.073 | 0.067 | 0.055 | 0.056 | 0.043 | 0.040 | 0.170 |
| Fe | 1.503 | 1.569 | 1.703 | 1.626 | 1.682 | 1.640 | 1.667 | 1.403 | 1.368 | 2.019 | 1.136 |
| Mn | 0.012 | 0.011 | 0.015 | 0.015 | 0.013 | 0.012 | 0.018 | 0.017 | 0.025 | 0.064 | 0.005 |
| Mg | 0.702 | 0.776 | 0.685 | 0.721 | 0.683 | 0.686 | 0.654 | 0.957 | 0.957 | 0.082 | 1.182 |
| oct | 2.766 | 2.863 | 2.891 | 2.864 | 2.875 | 2.854 | 2.847 | 2.845 | 2.823 | 2.768 | 2.858 |
| Ca | 0.121 | 0.007 | 0.009 | 0.013 | 0.008 | 0.017 | 0.071 | 0.004 | 0.005 | 0.018 | 0.025 |
| Na | 0.003 | 0.001 | 0.003 | 0.004 | 0.000 | 0.008 | 0.010 | 0.006 | 0.005 | 0.070 | 0.051 |
| K | 0.788 | 0.851 | 0.885 | 0.873 | 0.887 | 0.859 | 0.821 | 0.895 | 0.925 | 0.928 | 0.663 |
| int | 0.912 | 0.859 | 0.897 | 0.890 | 0.895 | 0.884 | 0.903 | 0.904 | 0.935 | 1.016 | 0.738 |
| XMg | 0.316 | 0.329 | 0.285 | 0.305 | 0.287 | 0.293 | 0.280 | 0.403 | 0.407 | 0.038 | 0.510 |

Table DS5. Selected EMPA analyses of amphibole and pyroxene

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Omphacite | | |  |  | Amphibole | | |
|  | matrix | Inclusionsin garnet | |  |  | rock matrix | | |
|  | 1 | 2 | 3 |  |  | 4 | 5 | 6 |
| SiO2 | 55.03 | 55.67 | 55.58 |  |  | 48.86 | 46.25 | 42.80 |
| TiO2 | 0.14 | 0.07 | 0.080 |  |  | 0.24 | 0.36 | 0.379 |
| Al2O3 | 9.78 | 10.09 | 10.16 |  |  | 8.33 | 11.23 | 12.84 |
| Cr2O3 | 0.02 | 0.00 | 0.05 |  |  | 0.02 | 0.02 | 0.07 |
| FeO | 9.10 | 8.44 | 9.14 |  |  | 13.23 | 15.53 | 17.79 |
| MnO | 0.04 | 0.18 | 0.10 |  |  | 0.07 | 0.08 | 0.09 |
| MgO | 6.55 | 5.91 | 6.18 |  |  | 12.37 | 10.44 | 9.48 |
| CaO | 10.88 | 10.89 | 10.36 |  |  | 7.34 | 6.94 | 8.87 |
| Na2O | 8.04 | 8.39 | 8.53 |  |  | 4.22 | 4.63 | 4.11 |
| K2O | 0.04 | 0.01 | 0.00 |  |  | 0.28 | 0.38 | 0.76 |
| P2O5 | 0.02 | 0.00 | 0.06 |  |  | 0.00 | 0.04 | 0.03 |
| F | 0.00 | 0.00 | 0.00 |  |  | 0.08 | 0.06 | 0.05 |
| Cl | 0.02 | 0.00 | 0.00 |  |  | 0.00 | 0.02 | 0.00 |
| Total | 99.66 | 99.65 | 100.24 |  |  | 95.07 | 95.97 | 97.24 |
|  |  |  |  |  |  |  |  |  |
| Calculated for ∑cat = 4 and O = 6 | | | |  |  | Calculated for ∑T+C = 13 apfu | | |
| Si | 1.977 | 1.996 | 1.981 |  | Si | 7.199 | 6.837 | 6.401 |
| Ti | 0.004 | 0.002 | 0.002 |  | AlIV | 0.801 | 1.163 | 1.599 |
| Al | 0.414 | 0.426 | 0.427 |  | AlVI | 0.646 | 0.794 | 0.664 |
| Cr | 0.001 | 0.000 | 0.001 |  | Ti | 0.026 | 0.040 | 0.043 |
| Fe3+ | 0.183 | 0.161 | 0.195 |  | Fe3+ | 0.451 | 0.567 | 0.562 |
| Fe2+ | 0.090 | 0.093 | 0.077 |  | Mn | 0.009 | 0.010 | 0.011 |
| Mn | 0.001 | 0.005 | 0.003 |  | Mg | 2.717 | 2.299 | 2.112 |
| Mg | 0.351 | 0.316 | 0.328 |  | Fe2+ | 1.151 | 1.290 | 1.609 |
| Ca | 0.419 | 0.418 | 0.396 |  | Ca | 0.000 | 0.000 | 0.000 |
| Na | 0.560 | 0.583 | 0.589 |  | B site | 13.000 | 13.000 | 13.000 |
|  |  |  |  |  | Fe2+ | 0.029 | 0.063 | 0.055 |
| XNa | 0.57 | 0.58 | 0.60 |  | Ca | 1.168 | 1.099 | 1.421 |
|  |  |  |  |  | Na | 0.803 | 0.838 | 0.524 |
|  |  |  |  |  | A site |  |  |  |
|  |  |  |  |  | Ca | 0.000 | 0.000 | 0.000 |
|  |  |  |  |  | Na | 0.402 | 0.488 | 0.668 |
|  |  |  |  |  | K | 0.053 | 0.071 | 0.145 |
|  |  |  |  |  | ∑ A | 0.455 | 0.560 | 0.813 |

Table DS6. Selected EMPA data for epidote

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Biotite gneisses | | | | Leucocratic gneisses | | | | Eclogites | | | Schists | | | |
|  | allanite-epidote intergrowths | | | | pre-magmatic | | matrix | | matrix | | Incl. | detr.core | detrit rim | Inc.en grt | foliation |
|  | aln | aln | Ep-core | Ep-rim | core | rim | core | rim | core | rim |  |  |  |  |  |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| SiO2 | 32.71 | 34.10 | 38.57 | 38.62 | 38.06 | 37.94 | 38.16 | 38.14 | 37.85 | 38.11 | 37.92 | 36.01 | 38.33 | 38.16 | 38.70 |
| TiO2 | 0.11 | 0.08 | 0.11 | 0.10 | 0.18 | 0.02 | 0.09 | 0.18 | 0.12 | 0.09 | 0.11 | 0.10 | 0.11 | 0.06 | 0.09 |
| Al2O3 | 19.67 | 21.25 | 28.52 | 28.31 | 24.25 | 24.52 | 25.58 | 26.61 | 26.00 | 27.01 | 26.37 | 25.24 | 26.65 | 24.19 | 25.80 |
| Cr2O3 | 0.00 | 0.00 | 0.00 | 0.04 | 0.03 | 0.01 | 0.02 | 0.00 | 0.06 | 0.01 | 0.03 | 0.01 | 0.01 | 0.03 | 0.00 |
| FeO | 10.04 | 8.75 | 6.72 | 5.57 | 9.56 | 8.53 | 7.63 | 9.05 | 8.88 | 8.95 | 8.89 | 7.120 | 7.47 | 10.73 | 8.43 |
| MnO | 0.18 | 0.03 | 0.10 | 0.08 | 0.12 | 0.11 | 0.10 | 0.09 | 0.00 | 0.12 | 0.19 | 0.03 | 0.04 | 0.03 | 0.06 |
| MgO | 0.00 | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.01 | 0.24 | 0.02 | 0.14 | 0.06 |
| CaO | 16.44 | 17.32 | 24.34 | 23.26 | 23.82 | 23.28 | 24.41 | 24.87 | 23.89 | 25.25 | 22.85 | 20.20 | 22.98 | 23.07 | 23.68 |
| Na2O | 0.17 | 0.12 | 0.04 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.02 | 0.01 | 0.08 | 0.00 | 0.01 | 0.02 |
| K2O | 0.00 | 0.00 | 0.024 | 0.03 | 0.04 | 0.09 | 0.03 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| P2O5 | 0.00 | 0.04 | 0.04 | 0.05 | 0.04 | 0.01 | 0.03 | 0.03 | 0.06 | 0.00 | 0.06 | 0.05 | 0.03 | 0.15 | 0.05 |
| F | 0.07 | 0.02 | 0.05 | 0.00 | 0.04 | 0.00 | 0.00 | 0.06 | 0.00 | 0.09 | 0.01 | 0.05 | 0.00 | 0.01 | 0.00 |
| Cl | 0.03 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.04 | 0.02 | 0.00 | 0.00 |
| Total | 79.40 | 81.81 | 98.47 | 96.059 | 96.19 | 94.53 | 96.05 | 99.08 | 96.99 | 99.62 | 96.46 | 89.24 | 95.70 | 96.61 | 96.92 |
| Formulae calculated for O = 12.5 apfu | | | | | | | | | | | | | | | |
| Si | 3.124 | 3.143 | 2.970 | 3.028 | 3.033 | 3.058 | 3.028 | 2.949 | 2.982 | 2.931 | 3.063 | 3.043 | 3.032 | 3.027 | 3.038 |
| Ti | 0.008 | 0.006 | 0.006 | 0.006 | 0.011 | 0.001 | 0.005 | 0.011 | 0.007 | 0.005 | 0.007 | 0.006 | 0.007 | 0.004 | 0.005 |
| Al | 2.214 | 2.308 | 2.588 | 2.616 | 2.276 | 2.330 | 2.393 | 2.424 | 2.414 | 2.449 | 2.511 | 2.514 | 2.484 | 2.261 | 2.387 |
| Fe3+ | 0.802 | 0.675 | 0.433 | 0.365 | 0.637 | 0.575 | 0.506 | 0.585 | 0.585 | 0.576 | 0.600 | 0.509 | 0.494 | 0.711 | 0.553 |
| Mn | 0.015 | 0.002 | 0.006 | 0.005 | 0.007 | 0.007 | 0.007 | 0.006 | 0.000 | 0.008 | 0.013 | 0.002 | 0.003 | 0.002 | 0.004 |
| Mg | 0.000 | 0.004 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.005 | 0.000 | 0.001 | 0.030 | 0.003 | 0.017 | 0.007 |
| Ca | 1.682 | 1.711 | 2.007 | 1.954 | 2.033 | 2.011 | 2.076 | 2.060 | 2.017 | 2.081 | 1.977 | 1.829 | 1.948 | 1.960 | 1.992 |
| Na | 0.031 | 0.022 | 0.002 | 0.001 | 0.000 | 0.002 | 0.000 | 0.001 | 0.001 | 0.002 | 0.002 | 0.013 | 0.000 | 0.002 | 0.003 |
| K | 0.000 | 0.000 | 0.002 | 0.003 | 0.004 | 0.010 | 0.003 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 |