**Supplementary Data Table 4:** Representative electron microprobe mineral analyses from samples 53815 and 53816.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sample:** | **53815** | | | | | |
| **Mineral:** | **cd** | **bi** | **chl** | **ilm** | **st** | **pl** |
| **SiO2** | 47.79 | 34.76 | 23.17 | 0.08 | 27.13 | 61.50 |
| **TiO2** | 0.03 | 1.28 | 0.08 | 50.74 | 0.31 | 0.01 |
| **Al2O3** | 33.86 | 21.25 | 23.88 | 0.15 | 55.53 | 25.60 |
| **Cr2O3** | 0.00 | 0.10 | 0.01 | 0.05 | 0.04 | 0.00 |
| **FeO** | 9.91 | 21.14 | 25.33 | 42.14 | 14.45 | 0.06 |
| **MnO** | 0.67 | 0.16 | 0.32 | 2.34 | 0.49 | 0.00 |
| **MgO** | 7.35 | 7.80 | 12.86 | 0.22 | 1.59 | 0.00 |
| **ZnO** | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 | 0.00 |
| **CaO** | 0.00 | 0.00 | 0.00 | 0.12 | 0.03 | 5.45 |
| **Na2O** | 0.19 | 0.28 | 0.02 | 0.04 | 0.00 | 8.82 |
| **K2O** | 0.00 | 7.98 | 0.00 | 0.01 | 0.00 | 0.02 |
| **Cl** | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 |
| **F** | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 |
|  |  |  |  |  |  |  |
| **Total** | 99.80 | 94.78 | 85.68 | 95.89 | 99.84 | 101.46 |
|  |  |  |  |  |  |  |
| **No. Oxygens** | 18.00 | 11.00 | 14.00 | 3.00 | 46.00 | 8.00 |
|  |  |  |  |  |  |  |
| **Si** | 4.87 | 2.66 | 2.51 | 0.00 | 7.41 | 2.69 |
| **Ti** | 0.00 | 0.07 | 0.01 | 1.00 | 0.06 | 0.00 |
| **Al** | 4.07 | 1.91 | 3.05 | 0.00 | 17.89 | 1.32 |
| **Cr** | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 |
| **Fe3+** | 0.22 | – | – | 0.00 | 0.14 | – |
| **Fe2+** | 0.62 | 1.35 | 2.29 | 0.92 | 3.16 | 0.00 |
| **Mn2+** | 0.06 | 0.01 | 0.03 | 0.05 | 0.11 | 0.00 |
| **Mg** | 1.12 | 0.89 | 2.08 | 0.01 | 0.65 | 0.00 |
| **Zn** | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 |
| **Ca** | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.26 |
| **Na** | 0.04 | 0.04 | 0.01 | 0.00 | 0.00 | 0.75 |
| **K** | 0.00 | 0.78 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Cl** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **F** | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| **OH-** | 0.00 | 1.99 | 8.00 | 0.00 | 4.00 | – |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample:** | **53816** | | | | | | |
| **Mineral:** | **st** | **bi** | **chl** | **ilm** | **pl** | **g rim** | **g core** |
| **SiO2** | 26.83 | 35.01 | 24.23 | 0.66 | 61.07 | 37.11 | 37.03 |
| **TiO2** | 0.44 | 1.50 | 0.06 | 52.95 | 0.02 | 0.00 | 0.02 |
| **Al2O3** | 55.81 | 19.43 | 23.79 | 0.20 | 24.60 | 20.83 | 20.85 |
| **Cr2O3** | 0.00 | 0.03 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 |
| **FeO** | 13.47 | 19.47 | 24.81 | 34.97 | 0.03 | 32.12 | 31.17 |
| **MnO** | 0.32 | 0.09 | 0.17 | 0.99 | 0.00 | 5.72 | 5.55 |
| **MgO** | 1.74 | 9.98 | 14.79 | 0.39 | 0.01 | 2.76 | 2.69 |
| **ZnO** | 1.25 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 |
| **CaO** | 0.00 | 0.02 | 0.00 | 0.07 | 5.51 | 1.15 | 2.24 |
| **Na2O** | 0.00 | 0.19 | 0.01 | 0.11 | 8.55 | 0.07 | 0.01 |
| **K2O** | 0.00 | 8.97 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 |
| **Cl** | 0.00 | 0.04 | 0.02 | 0.04 | 0.00 | 0.01 | 0.00 |
| **F** | 0.00 | 0.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|  |  |  |  |  |  |  |  |
| **Total** | 99.86 | 94.88 | 87.88 | 90.46 | 99.79 | 99.77 | 99.57 |
|  |  |  |  |  |  |  |  |
| **No. Oxygens** | 46.00 | 11.00 | 14.00 | 3.00 | 8.00 | 12.00 | 12.00 |
|  |  |  |  |  |  |  |  |
| **Si** | 7.33 | 2.67 | 2.54 | 0.02 | 2.72 | 3.00 | 3.00 |
| **Ti** | 0.09 | 0.09 | 0.00 | 1.11 | 0.00 | 0.00 | 0.00 |
| **Al** | 17.97 | 1.75 | 2.94 | 0.01 | 1.29 | 1.99 | 1.99 |
| **Cr** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Fe3+** | 0.19 | – | – | 0.00 | – | 0.02 | 0.01 |
| **Fe2+** | 2.88 | 1.24 | 2.17 | 0.81 | 0.00 | 2.16 | 2.10 |
| **Mn2+** | 0.07 | 0.01 | 0.02 | 0.02 | 0.00 | 0.39 | 0.38 |
| **Mg** | 0.71 | 1.14 | 2.31 | 0.02 | 0.00 | 0.33 | 0.32 |
| **Zn** | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Ca** | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 | 0.10 | 0.19 |
| **Na** | 0.00 | 0.03 | 0.00 | 0.01 | 0.74 | 0.01 | 0.00 |
| **K** | 0.00 | 0.87 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Cl** | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **F** | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **OH-** | 4.00 | 1.96 | 8.00 | 0.00 | – | 0.00 | 0.00 |