**Table S2 Representative microprobe analyses for minerals from the Baqing eclogite, amphibolite, schist, and gneiss.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | JM-2-Line 1 | Line 2 | Line 3 | Line 5 | Line 6 | Line 7 | Line 8 | Line 9 | Line 10 | Line 11 | Line 12 | Line 13 | Line 14 | Line 15 | Line 16 | Line 17 | Line 18 | Line 19 | Line 20 | 58 |
|  | Grt\* (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Outermost) | Grt# (Inc) |
| **Na2O** | 0.07 | 0.00 | 0.05 | 0.05 | 0.04 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.06 | 0.02 | 0.02 | 0.00 | 0.04 | 0.02 | 0.03 | 0.05 | 0.03 | 0.00 |
| **SiO2** | 38.47 | 37.94 | 38.53 | 38.31 | 38.29 | 38.47 | 38.38 | 38.33 | 38.24 | 38.40 | 38.31 | 38.53 | 38.30 | 38.38 | 38.14 | 38.39 | 38.55 | 38.89 | 38.59 | 37.09 |
| **Cr2O3** | 0.10 | 0.07 | 0.06 | 0.11 | 0.00 | 0.05 | 0.08 | 0.00 | 0.00 | 0.08 | 0.06 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.14 |
| **K2O** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 |
| **MgO** | 5.81 | 5.19 | 4.98 | 4.54 | 4.81 | 4.78 | 4.32 | 4.50 | 4.75 | 4.79 | 4.71 | 5.10 | 5.00 | 4.99 | 5.07 | 5.75 | 5.60 | 5.73 | 5.90 | 3.49 |
| **MnO** | 0.51 | 0.56 | 0.63 | 0.77 | 0.57 | 0.83 | 0.87 | 0.86 | 0.74 | 0.94 | 0.76 | 0.75 | 0.64 | 0.67 | 0.66 | 0.52 | 0.53 | 0.43 | 0.35 | 1.81 |
| **CaO** | 7.66 | 7.58 | 7.48 | 7.82 | 7.42 | 7.51 | 7.69 | 7.66 | 7.54 | 7.68 | 7.71 | 7.53 | 7.77 | 7.69 | 7.83 | 7.46 | 7.65 | 7.78 | 7.92 | 7.43 |
| **Al2O3** | 21.16 | 22.01 | 20.78 | 21.73 | 20.73 | 20.94 | 21.58 | 20.70 | 21.06 | 21.34 | 21.00 | 21.58 | 21.79 | 21.73 | 21.59 | 20.99 | 21.11 | 21.76 | 21.88 | 21.75 |
| **TFeO** | 25.35 | 26.12 | 26.32 | 26.22 | 27.17 | 26.45 | 26.37 | 27.08 | 27.14 | 26.01 | 26.98 | 26.27 | 26.23 | 26.19 | 26.10 | 26.27 | 25.96 | 24.78 | 24.46 | 27.91 |
| **TiO2** | 0.00 | 0.11 | 0.12 | 0.15 | 0.00 | 0.10 | 0.10 | 0.00 | 0.14 | 0.00 | 0.00 | 0.07 | 0.09 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 0.13 | 0.07 |
| **Total** | 99.13 | 99.68 | 99.01 | 99.70 | 99.03 | 99.13 | 99.44 | 99.13 | 99.63 | 99.28 | 99.59 | 99.92 | 99.91 | 99.65 | 99.54 | 99.46 | 99.47 | 99.42 | 99.37 | 99.69 |
| **O** | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 |
| **Na** | 0.02 | 0.00 | 0.02 | 0.02 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 | 0.00 |
| **Si** | 6.04 | 5.94 | 6.08 | 6.00 | 6.06 | 6.07 | 6.03 | 6.07 | 6.02 | 6.04 | 6.04 | 6.02 | 5.98 | 6.01 | 5.98 | 6.02 | 6.04 | 6.05 | 6.01 | 5.90 |
| **Cr** | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 |
| **K** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Mg** | 1.36 | 1.21 | 1.17 | 1.06 | 1.14 | 1.12 | 1.01 | 1.06 | 1.12 | 1.12 | 1.11 | 1.19 | 1.16 | 1.16 | 1.19 | 1.35 | 1.31 | 1.33 | 1.37 | 0.83 |
| **Mn** | 0.07 | 0.07 | 0.08 | 0.10 | 0.08 | 0.11 | 0.12 | 0.12 | 0.10 | 0.13 | 0.10 | 0.10 | 0.08 | 0.09 | 0.09 | 0.07 | 0.07 | 0.06 | 0.05 | 0.24 |
| **Ca** | 1.29 | 1.27 | 1.26 | 1.31 | 1.26 | 1.27 | 1.30 | 1.30 | 1.27 | 1.29 | 1.30 | 1.26 | 1.30 | 1.29 | 1.32 | 1.25 | 1.28 | 1.30 | 1.32 | 1.27 |
| **Al** | 3.91 | 4.06 | 3.86 | 4.01 | 3.87 | 3.89 | 4.00 | 3.86 | 3.91 | 3.96 | 3.90 | 3.97 | 4.01 | 4.01 | 3.99 | 3.88 | 3.90 | 3.99 | 4.01 | 4.08 |
| **Fe2+** | 3.32 | 3.41 | 3.46 | 3.43 | 3.59 | 3.48 | 3.46 | 3.58 | 3.57 | 3.41 | 3.55 | 3.42 | 3.42 | 3.42 | 3.42 | 3.44 | 3.39 | 3.22 | 3.18 | 3.70 |
| **Ti** | 0.00 | 0.01 | 0.01 | 0.02 | 0.00 | 0.01 | 0.01 | 0.00 | 0.02 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.01 |
| **Fe3+** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Cations** | 16.01 | 16.00 | 15.97 | 15.97 | 16.01 | 15.97 | 15.95 | 16.00 | 16.01 | 15.97 | 16.02 | 15.99 | 15.99 | 15.99 | 16.01 | 16.03 | 16.01 | 15.96 | 15.97 | 16.04 |
| **Xprp** | 22.53 | 20.29 | 19.57 | 17.96 | 18.74 | 18.78 | 17.21 | 17.54 | 18.43 | 18.86 | 18.27 | 19.89 | 19.51 | 19.53 | 19.74 | 22.02 | 21.60 | 22.53 | 23.15 | 13.70 |
| **Xgrs** | 21.34 | 21.30 | 21.12 | 22.24 | 20.77 | 21.20 | 22.02 | 21.46 | 21.02 | 21.73 | 21.49 | 21.10 | 21.79 | 21.62 | 21.91 | 20.53 | 21.20 | 21.98 | 22.34 | 20.96 |
| **Xalm** | 55.01 | 57.16 | 57.90 | 58.07 | 59.23 | 58.16 | 58.80 | 59.09 | 58.93 | 57.31 | 58.57 | 57.34 | 57.29 | 57.36 | 56.89 | 56.31 | 56.04 | 54.53 | 53.73 | 61.31 |
| **Xsps** | 1.12 | 1.24 | 1.41 | 1.73 | 1.26 | 1.85 | 1.97 | 1.90 | 1.63 | 2.10 | 1.67 | 1.66 | 1.42 | 1.49 | 1.46 | 1.13 | 1.16 | 0.96 | 0.78 | 4.04 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | YA-7-18-47-1-6.1 | Line 1 | Line 2 | Line 3 | Line 4 | Line 5 | Line 6 | Line 7 | Line 8 | Line 9 | Line 10 | Line 11 | Line 12 | Line 13 | Line 14 | Line 15 | Line 16 | Line 17 | Line 18 | Line 19 |
|  | Grt\*  (Outermost-rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) |
| **Na2O** | 0.02 | 0.03 | 0.06 | 0.05 | 0.04 | 0.04 | 0.08 | 0.08 | 0.08 | 0.14 | 0.96 | 0.17 | 0.27 | 0.09 | 0.11 | 0.08 | 0.06 | 0.11 | 0.02 | 0.08 |
| **SiO2** | 39.69 | 40.00 | 38.97 | 38.98 | 38.73 | 38.45 | 38.63 | 38.49 | 38.43 | 38.35 | 39.73 | 38.39 | 38.56 | 38.17 | 38.25 | 38.11 | 38.33 | 37.11 | 38.61 | 38.81 |
| **Cr2O3** | 0.00 | 0.03 | 0.01 | 0.02 | 0.00 | 0.00 | 0.03 | 0.02 | 0.01 | 0.00 | 0.02 | 0.01 | 0.03 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| **K2O** | 0.00 | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.17 | 0.03 | 0.03 | 0.05 | 0.01 | 0.02 | 0.02 | 0.02 | 0.00 | 0.01 |
| **MgO** | 7.44 | 7.08 | 4.86 | 4.68 | 4.32 | 3.82 | 3.24 | 3.63 | 3.22 | 3.52 | 2.90 | 2.32 | 2.86 | 2.73 | 2.55 | 2.65 | 2.71 | 2.21 | 3.95 | 4.87 |
| **MnO** | 0.23 | 0.23 | 0.48 | 0.29 | 0.36 | 0.47 | 0.62 | 0.69 | 0.76 | 0.78 | 0.79 | 0.61 | 0.76 | 0.79 | 0.77 | 0.77 | 0.71 | 0.50 | 0.44 | 0.34 |
| **CaO** | 8.62 | 8.67 | 8.02 | 8.54 | 8.14 | 8.44 | 8.73 | 7.94 | 8.52 | 8.33 | 8.46 | 12.91 | 8.66 | 8.72 | 9.06 | 8.34 | 8.77 | 12.78 | 8.37 | 8.09 |
| **Al2O3** | 22.85 | 22.54 | 22.20 | 22.19 | 21.86 | 21.67 | 21.61 | 21.63 | 21.40 | 21.16 | 21.99 | 20.81 | 21.29 | 21.18 | 20.99 | 21.33 | 21.41 | 16.99 | 21.59 | 21.39 |
| **TFeO** | 23.37 | 22.09 | 26.00 | 26.20 | 27.14 | 26.90 | 27.31 | 27.73 | 27.33 | 27.17 | 25.82 | 23.89 | 26.78 | 27.62 | 27.46 | 28.23 | 27.98 | 22.14 | 27.04 | 26.04 |
| **TiO2** | 0.01 | 0.03 | 0.04 | 0.03 | 0.04 | 0.05 | 0.07 | 0.07 | 0.02 | 0.05 | 0.88 | 0.09 | 0.08 | 0.11 | 0.72 | 0.12 | 0.07 | 8.13 | 0.05 | 0.06 |
| **Total** | 102.23 | 100.70 | 100.64 | 101.02 | 100.63 | 99.84 | 100.35 | 100.29 | 99.77 | 99.50 | 101.71 | 99.22 | 99.33 | 99.49 | 99.94 | 99.65 | 100.05 | 99.97 | 100.07 | 99.69 |
| **O** | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 |
| **Na** | 0.01 | 0.01 | 0.02 | 0.02 | 0.01 | 0.01 | 0.03 | 0.03 | 0.02 | 0.04 | 0.29 | 0.05 | 0.08 | 0.03 | 0.04 | 0.02 | 0.02 | 0.03 | 0.00 | 0.02 |
| **Si** | 5.96 | 6.06 | 6.02 | 6.01 | 6.02 | 6.03 | 6.05 | 6.03 | 6.06 | 6.06 | 6.10 | 6.07 | 6.10 | 6.05 | 6.04 | 6.04 | 6.05 | 5.84 | 6.04 | 6.06 |
| **Cr** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **K** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Mg** | 1.67 | 1.60 | 1.12 | 1.08 | 1.00 | 0.89 | 0.76 | 0.85 | 0.76 | 0.83 | 0.66 | 0.55 | 0.67 | 0.65 | 0.60 | 0.63 | 0.64 | 0.52 | 0.92 | 1.13 |
| **Mn** | 0.03 | 0.03 | 0.06 | 0.04 | 0.05 | 0.06 | 0.08 | 0.09 | 0.10 | 0.10 | 0.10 | 0.08 | 0.10 | 0.11 | 0.10 | 0.10 | 0.09 | 0.07 | 0.06 | 0.04 |
| **Ca** | 1.39 | 1.41 | 1.33 | 1.41 | 1.36 | 1.42 | 1.47 | 1.33 | 1.44 | 1.41 | 1.39 | 2.19 | 1.47 | 1.48 | 1.53 | 1.42 | 1.48 | 2.15 | 1.40 | 1.35 |
| **Al** | 4.04 | 4.02 | 4.04 | 4.03 | 4.01 | 4.01 | 3.99 | 4.00 | 3.98 | 3.94 | 3.98 | 3.88 | 3.97 | 3.96 | 3.91 | 3.99 | 3.98 | 3.15 | 3.98 | 3.94 |
| **Fe2+** | 2.93 | 2.80 | 3.36 | 3.38 | 3.53 | 3.53 | 3.58 | 3.63 | 3.60 | 3.59 | 3.31 | 3.16 | 3.54 | 3.66 | 3.63 | 3.74 | 3.69 | 2.91 | 3.54 | 3.40 |
| **Ti** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.10 | 0.01 | 0.01 | 0.01 | 0.09 | 0.01 | 0.01 | 0.96 | 0.01 | 0.01 |
| **Fe3+** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Cations** | 16.02 | 15.93 | 15.96 | 15.98 | 15.98 | 15.96 | 15.96 | 15.97 | 15.96 | 15.98 | 15.97 | 16.00 | 15.95 | 15.97 | 15.94 | 15.96 | 15.96 | 15.64 | 15.96 | 15.97 |
| **Xprp** | 27.69 | 27.41 | 19.07 | 18.24 | 16.89 | 15.14 | 12.86 | 14.36 | 12.84 | 13.97 | 12.13 | 9.17 | 11.64 | 10.95 | 10.23 | 10.63 | 10.78 | 9.15 | 15.55 | 19.11 |
| **Xgrs** | 23.05 | 24.13 | 22.62 | 23.90 | 22.85 | 24.03 | 24.92 | 22.56 | 24.39 | 23.77 | 25.42 | 36.60 | 25.37 | 25.14 | 26.15 | 24.06 | 25.09 | 38.12 | 23.70 | 22.81 |
| **Xalm** | 48.77 | 47.97 | 57.24 | 57.22 | 59.47 | 59.76 | 60.83 | 61.53 | 61.06 | 60.51 | 60.58 | 52.87 | 61.23 | 62.12 | 61.87 | 63.54 | 62.52 | 51.55 | 59.76 | 57.33 |
| **Xsps** | 0.49 | 0.50 | 1.07 | 0.64 | 0.79 | 1.06 | 1.39 | 1.55 | 1.72 | 1.75 | 1.87 | 1.36 | 1.76 | 1.79 | 1.75 | 1.76 | 1.61 | 1.17 | 0.99 | 0.75 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | YA-6-35-Line 1 | Line 2 | Line 3 | Line 4 | Line 5 | Line 6 | Line 7 | Line 8 | Line 9 | Line 10 | Line 11 | Line 12 | Line 13 | Line 14 | Line 15 | Line 16 | Line 17 | Line 18 | Line 20 |
|  | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt\* (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Core) |
| **Na2O** | 0.04 | 0.02 | 0.04 | 0.04 | 0.02 | 0.04 | 0.04 | 0.00 | 0.01 | 0.02 | 0.01 | 0.03 | 0.05 | 0.03 | 0.05 | 0.05 | 0.03 | 0.03 | 0.03 |
| **SiO2** | 39.71 | 38.75 | 39.06 | 39.63 | 40.08 | 41.46 | 38.94 | 39.60 | 39.55 | 39.00 | 39.63 | 39.41 | 39.87 | 40.58 | 39.65 | 39.67 | 39.13 | 39.68 | 38.95 |
| **Cr2O3** | 0.03 | 0.01 | 0.02 | 0.00 | 0.01 | 0.06 | 0.05 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.04 | 0.03 | 0.04 | 0.05 | 0.03 | 0.06 | 0.00 |
| **K2O** | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.02 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 |
| **MgO** | 6.50 | 6.27 | 6.34 | 6.41 | 6.38 | 6.77 | 6.06 | 6.37 | 6.39 | 6.44 | 6.39 | 6.35 | 6.30 | 6.37 | 6.25 | 6.14 | 5.72 | 5.19 | 4.78 |
| **MnO** | 0.46 | 0.41 | 0.45 | 0.44 | 0.44 | 0.44 | 0.48 | 0.43 | 0.47 | 0.44 | 0.46 | 0.43 | 0.46 | 0.44 | 0.49 | 0.44 | 0.46 | 0.46 | 0.54 |
| **CaO** | 7.70 | 7.78 | 7.51 | 7.79 | 7.84 | 7.83 | 7.93 | 7.99 | 7.69 | 7.75 | 7.71 | 7.72 | 7.73 | 7.73 | 7.90 | 7.72 | 7.52 | 7.44 | 7.34 |
| **Al2O3** | 21.97 | 21.46 | 21.85 | 22.04 | 22.18 | 22.77 | 21.04 | 22.03 | 22.01 | 21.53 | 22.12 | 21.73 | 21.79 | 22.41 | 21.97 | 21.91 | 21.71 | 22.11 | 21.61 |
| **TFeO** | 24.64 | 24.79 | 24.85 | 24.71 | 24.72 | 24.49 | 24.69 | 24.40 | 24.70 | 24.60 | 24.55 | 24.59 | 24.66 | 24.87 | 24.93 | 25.28 | 25.44 | 26.91 | 27.31 |
| **TiO2** | 0.03 | 0.02 | 0.03 | 0.01 | 0.03 | 0.04 | 0.03 | 0.03 | 0.03 | 0.00 | 0.02 | 0.01 | 0.02 | 0.02 | 0.01 | 0.03 | 1.16 | 0.03 | 0.08 |
| **Total** | 101.08 | 99.50 | 100.17 | 101.11 | 101.69 | 103.90 | 99.28 | 100.85 | 100.86 | 99.81 | 100.90 | 100.28 | 100.95 | 102.51 | 101.29 | 101.29 | 101.20 | 101.92 | 100.65 |
| **O** | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 |
| **Na** | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 |
| **Si** | 6.06 | 6.03 | 6.03 | 6.05 | 6.07 | 6.12 | 6.08 | 6.05 | 6.05 | 6.04 | 6.05 | 6.06 | 6.09 | 6.09 | 6.05 | 6.06 | 5.99 | 6.06 | 6.05 |
| **Cr** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 |
| **K** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Mg** | 1.48 | 1.45 | 1.46 | 1.46 | 1.44 | 1.49 | 1.41 | 1.45 | 1.46 | 1.49 | 1.45 | 1.46 | 1.44 | 1.42 | 1.42 | 1.40 | 1.31 | 1.18 | 1.11 |
| **Mn** | 0.06 | 0.05 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.07 |
| **Ca** | 1.26 | 1.30 | 1.24 | 1.27 | 1.27 | 1.24 | 1.33 | 1.31 | 1.26 | 1.29 | 1.26 | 1.27 | 1.27 | 1.24 | 1.29 | 1.26 | 1.23 | 1.22 | 1.22 |
| **Al** | 3.95 | 3.94 | 3.97 | 3.97 | 3.96 | 3.96 | 3.87 | 3.97 | 3.97 | 3.93 | 3.98 | 3.94 | 3.92 | 3.97 | 3.95 | 3.94 | 3.92 | 3.98 | 3.96 |
| **Fe2+** | 3.14 | 3.23 | 3.21 | 3.15 | 3.13 | 3.02 | 3.22 | 3.12 | 3.16 | 3.19 | 3.14 | 3.17 | 3.15 | 3.12 | 3.18 | 3.23 | 3.26 | 3.44 | 3.55 |
| **Ti** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 | 0.01 |
| **Fe3+** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Cations** | 15.97 | 16.00 | 15.99 | 15.98 | 15.94 | 15.90 | 15.99 | 15.96 | 15.97 | 16.00 | 15.95 | 15.97 | 15.95 | 15.93 | 15.98 | 15.97 | 15.92 | 15.95 | 15.97 |
| **Xprp** | 24.88 | 24.10 | 24.45 | 24.54 | 24.42 | 25.66 | 23.40 | 24.46 | 24.53 | 24.71 | 24.59 | 24.47 | 24.28 | 24.37 | 23.85 | 23.50 | 22.29 | 20.05 | 18.61 |
| **Xgrs** | 21.19 | 21.51 | 20.81 | 21.43 | 21.55 | 21.32 | 22.03 | 22.04 | 21.23 | 21.37 | 21.35 | 21.40 | 21.41 | 21.26 | 21.70 | 21.25 | 21.06 | 20.66 | 20.55 |
| **Xalm** | 52.94 | 53.50 | 53.77 | 53.06 | 53.06 | 52.06 | 53.52 | 52.57 | 53.20 | 52.96 | 53.04 | 53.19 | 53.31 | 53.42 | 53.40 | 54.29 | 55.63 | 58.28 | 59.65 |
| **Xsps** | 0.99 | 0.89 | 0.97 | 0.96 | 0.97 | 0.95 | 1.05 | 0.93 | 1.03 | 0.96 | 1.01 | 0.94 | 1.00 | 0.95 | 1.05 | 0.96 | 1.02 | 1.02 | 1.19 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | YA-6-35-Line 21 | Line 23 | Line 24 | Line 25 | Line 26 | Line 27 | Line 28 | Line 29 | Line 30 | Line 31 | Line 32 | Line 33 | Line 34 | Line 35 | YA-18-43-16.1 | 24 | 25 | 26 | *Glk-7-18-8-Line 1* | *Line 2* | *Line 3* |
|  | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt# (Core) | Grt (Core) | Grt (Core) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt # (Core) | Grt (Core) | Grt (Rim) | *Grt\* (Rim)* | *Grt (Mantle)* | *Grt (Core)* |
| **Na2O** | 0.04 | 0.06 | 0.06 | 0.09 | 0.07 | 0.03 | 0.02 | 0.12 | 0.12 | 0.38 | 0.07 | 0.15 | 0.08 | 0.05 | 0.09 | 0.01 | 0.01 | 0.03 | *0.02* | *0.01* | *0.10* |
| **SiO2** | 39.22 | 38.76 | 38.94 | 39.53 | 39.58 | 40.16 | 39.01 | 39.31 | 38.42 | 38.40 | 39.99 | 39.27 | 38.90 | 39.45 | 39.15 | 38.37 | 38.30 | 39.00 | *38.86* | *38.72* | *38.48* |
| **Cr2O3** | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.02 | 0.00 | 0.03 | 0.02 | 0.00 | 0.07 | 0.01 | 0.03 | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | *0.02* | *0.05* | *0.02* |
| **K2O** | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.08 | 0.01 | 0.04 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | *0.00* | *0.01* | *0.00* |
| **MgO** | 5.36 | 5.11 | 4.79 | 5.05 | 4.81 | 4.42 | 4.51 | 5.36 | 4.06 | 5.00 | 5.68 | 5.65 | 6.09 | 6.20 | 4.64 | 1.60 | 1.24 | 3.33 | *3.08* | *1.90* | *1.46* |
| **MnO** | 0.60 | 0.63 | 0.65 | 0.74 | 0.69 | 0.78 | 0.71 | 0.69 | 0.70 | 0.65 | 0.58 | 0.59 | 0.52 | 0.50 | 0.18 | 1.74 | 2.74 | 0.23 | *0.39* | *0.69* | *3.09* |
| **CaO** | 7.22 | 7.55 | 7.81 | 7.18 | 8.01 | 7.61 | 7.82 | 7.37 | 8.65 | 7.70 | 7.72 | 8.08 | 7.40 | 7.90 | 7.15 | 7.97 | 8.13 | 7.25 | *7.92* | *8.46* | *8.36* |
| **Al2O3** | 21.77 | 21.56 | 21.51 | 21.82 | 21.36 | 22.03 | 21.39 | 21.69 | 21.25 | 21.07 | 21.60 | 21.72 | 21.66 | 21.80 | 21.43 | 21.55 | 21.00 | 21.58 | *21.51* | *21.37* | *21.33* |
| **TFeO** | 27.16 | 26.51 | 26.39 | 27.26 | 26.54 | 27.62 | 26.77 | 25.83 | 26.57 | 25.80 | 25.56 | 25.36 | 25.70 | 24.53 | 28.09 | 30.99 | 30.15 | 30.46 | *29.48* | *30.58* | *28.80* |
| **TiO2** | 0.07 | 0.10 | 0.16 | 0.06 | 0.12 | 0.05 | 0.04 | 0.05 | 0.33 | 0.58 | 0.11 | 0.17 | 0.06 | 0.03 | 0.04 | 0.13 | 0.26 | 0.05 | *0.04* | *0.15* | *0.17* |
| **Total** | 101.48 | 100.29 | 100.32 | 101.74 | 101.18 | 102.70 | 100.26 | 100.55 | 100.12 | 99.64 | 101.41 | 101.01 | 100.44 | 100.50 | 100.79 | 102.37 | 101.83 | 101.98 | *101.32* | *101.93* | *101.80* |
| **O** | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | *24.0* | *24.0* | *24.0* |
| **Na** | 0.01 | 0.02 | 0.02 | 0.03 | 0.02 | 0.01 | 0.00 | 0.04 | 0.03 | 0.12 | 0.02 | 0.04 | 0.02 | 0.02 | 0.03 | 0.00 | 0.00 | 0.01 | *0.01* | *0.00* | *0.03* |
| **Si** | 6.03 | 6.03 | 6.06 | 6.06 | 6.10 | 6.10 | 6.08 | 6.07 | 6.02 | 6.02 | 6.11 | 6.04 | 6.01 | 6.06 | 6.08 | 6.00 | 6.04 | 6.05 | *6.06* | *6.05* | *6.04* |
| **Cr** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | *0.00* | *0.01* | *0.00* |
| **K** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | *0.00* | *0.00* | *0.00* |
| **Mg** | 1.23 | 1.18 | 1.11 | 1.15 | 1.11 | 1.00 | 1.05 | 1.24 | 0.95 | 1.17 | 1.29 | 1.29 | 1.40 | 1.42 | 1.07 | 0.37 | 0.29 | 0.77 | *0.72* | *0.44* | *0.34* |
| **Mn** | 0.08 | 0.08 | 0.09 | 0.10 | 0.09 | 0.10 | 0.09 | 0.09 | 0.09 | 0.09 | 0.08 | 0.08 | 0.07 | 0.06 | 0.02 | 0.23 | 0.37 | 0.03 | *0.05* | *0.09* | *0.41* |
| **Ca** | 1.19 | 1.26 | 1.30 | 1.18 | 1.32 | 1.24 | 1.31 | 1.22 | 1.45 | 1.29 | 1.26 | 1.33 | 1.23 | 1.30 | 1.19 | 1.34 | 1.37 | 1.21 | *1.32* | *1.42* | *1.41* |
| **Al** | 3.95 | 3.95 | 3.94 | 3.94 | 3.88 | 3.95 | 3.93 | 3.95 | 3.92 | 3.89 | 3.89 | 3.93 | 3.95 | 3.95 | 3.92 | 3.98 | 3.90 | 3.95 | *3.95* | *3.94* | *3.95* |
| **Fe2+** | 3.49 | 3.45 | 3.43 | 3.50 | 3.42 | 3.51 | 3.49 | 3.34 | 3.48 | 3.38 | 3.27 | 3.26 | 3.32 | 3.15 | 3.65 | 4.06 | 3.98 | 3.95 | *3.84* | *4.00* | *3.78* |
| **Ti** | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.04 | 0.07 | 0.01 | 0.02 | 0.01 | 0.00 | 0.01 | 0.01 | 0.03 | 0.01 | *0.00* | *0.02* | *0.02* |
| **Fe3+** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | *0.00* | *0.00* | *0.00* |
| **Cations** | 15.99 | 15.99 | 15.96 | 15.97 | 15.96 | 15.92 | 15.95 | 15.97 | 16.00 | 16.03 | 15.94 | 16.00 | 16.02 | 15.97 | 15.97 | 16.00 | 15.98 | 15.97 | *15.96* | *15.96* | *15.98* |
| **Xprp** | 20.52 | 19.82 | 18.72 | 19.48 | 18.61 | 17.12 | 17.65 | 20.99 | 15.86 | 19.71 | 21.92 | 21.71 | 23.33 | 23.93 | 18.10 | 6.21 | 4.86 | 12.93 | *12.07* | *7.43* | *5.76* |
| **Xgrs** | 19.86 | 21.07 | 21.94 | 19.91 | 22.27 | 21.17 | 21.99 | 20.75 | 24.31 | 21.81 | 21.43 | 22.31 | 20.35 | 21.90 | 20.04 | 22.29 | 22.86 | 20.23 | *22.31* | *23.82* | *23.67* |
| **Xalm** | 58.31 | 57.73 | 57.90 | 59.00 | 57.59 | 59.99 | 58.79 | 56.73 | 58.28 | 57.02 | 55.38 | 54.68 | 55.20 | 53.08 | 61.45 | 67.67 | 66.19 | 66.32 | *64.77* | *67.22* | *63.64* |
| **Xsps** | 1.31 | 1.38 | 1.43 | 1.61 | 1.52 | 1.72 | 1.57 | 1.53 | 1.56 | 1.46 | 1.27 | 1.30 | 1.12 | 1.09 | 0.40 | 3.84 | 6.09 | 0.51 | *0.86* | *1.53* | *6.93* |

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| **Sample** | Glk-7-18-6-2 | 3 | Glk-7-18-7-Line 1 | Line 2 | Line 3 | Line 4 | Line 5 | Line 6 | Line 7 | Line 8 | Line 9 | Line 10 | Line 11 | Line 12 | Line 13 | Line 14 | Line 15 | Line 16 | Line 17 | Line 18 | Line 19 | Line 20 |
|  | Grt (Core) | Grt\* (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt\* (Rim) |
| **Na2O** | 0.03 | 0.04 | 0.04 | 0.04 | 0.01 | 0.03 | 0.03 | 0.03 | 0.02 | 0.01 | 0.02 | 0.02 | 0.02 | 0.03 | 0.00 | 0.02 | 0.03 | 0.02 | 0.01 | 0.01 | 0.01 | 0.02 |
| **SiO2** | 38.77 | 38.84 | 39.70 | 39.16 | 39.14 | 38.87 | 39.36 | 39.39 | 39.48 | 39.41 | 39.23 | 38.64 | 39.01 | 39.34 | 39.12 | 39.74 | 39.19 | 39.31 | 39.30 | 39.45 | 39.52 | 39.94 |
| **Cr2O3** | 0.02 | 0.00 | 0.10 | 0.05 | 0.11 | 0.15 | 0.08 | 0.09 | 0.07 | 0.06 | 0.07 | 0.09 | 0.08 | 0.06 | 0.07 | 0.10 | 0.07 | 0.08 | 0.05 | 0.10 | 0.07 | 0.07 |
| **K2O** | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.01 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.02 |
| **MgO** | 2.05 | 2.34 | 3.60 | 3.45 | 2.94 | 2.87 | 2.84 | 2.70 | 2.69 | 2.79 | 2.82 | 2.85 | 2.82 | 2.98 | 2.86 | 3.00 | 2.89 | 2.94 | 3.00 | 3.26 | 3.69 | 4.31 |
| **MnO** | 0.69 | 1.13 | 0.54 | 0.62 | 0.77 | 0.78 | 0.84 | 0.92 | 0.96 | 0.91 | 0.93 | 0.91 | 0.86 | 0.88 | 0.82 | 0.80 | 0.84 | 0.82 | 0.76 | 0.59 | 0.52 | 0.33 |
| **CaO** | 8.38 | 8.37 | 8.50 | 8.28 | 8.26 | 8.39 | 8.05 | 8.04 | 8.10 | 8.20 | 8.22 | 7.94 | 8.01 | 8.03 | 8.55 | 8.08 | 8.18 | 8.29 | 8.13 | 8.32 | 8.72 | 9.60 |
| **Al2O3** | 21.95 | 21.62 | 21.55 | 21.47 | 21.35 | 21.09 | 21.45 | 21.15 | 21.62 | 21.75 | 21.46 | 21.40 | 21.43 | 21.40 | 21.50 | 21.69 | 20.95 | 21.45 | 21.43 | 21.21 | 21.42 | 21.60 |
| **TFeO** | 30.90 | 30.06 | 28.90 | 29.25 | 29.76 | 29.53 | 30.11 | 30.01 | 30.06 | 30.10 | 30.04 | 29.73 | 29.85 | 29.89 | 29.53 | 29.84 | 29.62 | 29.92 | 29.84 | 29.09 | 28.40 | 26.36 |
| **TiO2** | 0.12 | 0.14 | 0.08 | 0.07 | 0.07 | 0.12 | 0.07 | 0.09 | 0.09 | 0.08 | 0.12 | 0.08 | 0.06 | 0.10 | 0.08 | 0.05 | 0.09 | 0.09 | 0.07 | 0.06 | 0.11 | 0.03 |
| **Total** | 102.92 | 102.55 | 103.01 | 102.38 | 102.42 | 101.83 | 102.84 | 102.43 | 103.11 | 103.32 | 102.96 | 101.68 | 102.13 | 102.72 | 102.54 | 103.34 | 101.85 | 102.94 | 102.58 | 102.10 | 102.47 | 102.27 |
| **O** | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 |
| **Na** | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 |
| **Si** | 6.00 | 6.02 | 6.07 | 6.05 | 6.06 | 6.06 | 6.07 | 6.10 | 6.07 | 6.05 | 6.05 | 6.03 | 6.06 | 6.07 | 6.05 | 6.08 | 6.10 | 6.06 | 6.07 | 6.10 | 6.07 | 6.10 |
| **Cr** | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| **K** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Mg** | 0.47 | 0.54 | 0.82 | 0.79 | 0.68 | 0.67 | 0.65 | 0.62 | 0.62 | 0.64 | 0.65 | 0.66 | 0.65 | 0.69 | 0.66 | 0.68 | 0.67 | 0.67 | 0.69 | 0.75 | 0.84 | 0.98 |
| **Mn** | 0.09 | 0.15 | 0.07 | 0.08 | 0.10 | 0.10 | 0.11 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.11 | 0.11 | 0.11 | 0.10 | 0.11 | 0.11 | 0.10 | 0.08 | 0.07 | 0.04 |
| **Ca** | 1.39 | 1.39 | 1.39 | 1.37 | 1.37 | 1.40 | 1.33 | 1.33 | 1.34 | 1.35 | 1.36 | 1.33 | 1.33 | 1.33 | 1.42 | 1.33 | 1.36 | 1.37 | 1.35 | 1.38 | 1.44 | 1.57 |
| **Al** | 4.00 | 3.95 | 3.89 | 3.91 | 3.90 | 3.87 | 3.90 | 3.86 | 3.92 | 3.93 | 3.90 | 3.94 | 3.92 | 3.89 | 3.92 | 3.91 | 3.84 | 3.90 | 3.90 | 3.86 | 3.88 | 3.89 |
| **Fe2+** | 4.00 | 3.90 | 3.70 | 3.78 | 3.85 | 3.85 | 3.88 | 3.89 | 3.87 | 3.86 | 3.87 | 3.88 | 3.88 | 3.86 | 3.82 | 3.82 | 3.86 | 3.86 | 3.85 | 3.76 | 3.65 | 3.36 |
| **Ti** | 0.01 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 |
| **Fe3+** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Cations** | 15.99 | 15.99 | 15.97 | 16.00 | 15.98 | 15.99 | 15.97 | 15.96 | 15.96 | 15.97 | 15.99 | 15.99 | 15.97 | 15.97 | 15.98 | 15.95 | 15.97 | 15.99 | 15.97 | 15.96 | 15.97 | 15.96 |
| **Xprp** | 7.96 | 9.06 | 13.71 | 13.18 | 11.32 | 11.08 | 10.94 | 10.46 | 10.38 | 10.69 | 10.81 | 11.08 | 10.94 | 11.46 | 10.99 | 11.54 | 11.18 | 11.22 | 11.54 | 12.60 | 14.08 | 16.45 |
| **Xgrs** | 23.34 | 23.25 | 23.30 | 22.75 | 22.82 | 23.27 | 22.25 | 22.35 | 22.47 | 22.59 | 22.63 | 22.15 | 22.29 | 22.18 | 23.60 | 22.34 | 22.72 | 22.80 | 22.47 | 23.10 | 23.94 | 26.34 |
| **Xalm** | 67.19 | 65.21 | 61.82 | 62.73 | 64.18 | 63.93 | 64.98 | 65.16 | 65.06 | 64.73 | 64.53 | 64.77 | 64.88 | 64.44 | 63.62 | 64.38 | 64.26 | 64.19 | 64.34 | 63.01 | 60.84 | 56.48 |
| **Xsps** | 1.51 | 2.48 | 1.17 | 1.34 | 1.68 | 1.72 | 1.83 | 2.03 | 2.09 | 1.99 | 2.03 | 2.00 | 1.89 | 1.91 | 1.79 | 1.74 | 1.84 | 1.79 | 1.65 | 1.29 | 1.13 | 0.72 |

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| **Sample** | YA-7-18-44-Line 1 | Line 2 | Line 3 | Line 4 | Line 5 | Line 6 | Line 7 | Line 8 | Line 9 | Line 10 | Line 11 | Line 12 | Line 13 | Line 14 | 17YA-18-Line 1 | Line 3 | Line 4 | Line 5 | Line 6 | Line 7 | Line 8 | Line 9 | Line 10 |
|  | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Core) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt\* (Rim) | Grt (Rim) | Grt (Rim) | Grt (Rim) | Grt (Core) | Grt (Core) | Grt (Core) | Grt\* (Core) | Grt (Rim) | Grt (Rim) |
| **Na2O** | 0.00 | 0.09 | 0.09 | 0.09 | 0.11 | 0.08 | 0.08 | 0.06 | 0.15 | 0.10 | 0.03 | 0.02 | 0.04 | 0.00 | 0.00 | 0.04 | 0.07 | 0.03 | 0.05 | 0.03 | 0.00 | 0.00 | 0.00 |
| **SiO2** | 38.24 | 38.26 | 37.51 | 37.57 | 37.41 | 38.20 | 38.32 | 37.73 | 37.64 | 37.35 | 38.40 | 38.21 | 37.50 | 37.96 | 37.34 | 37.03 | 37.00 | 37.36 | 36.73 | 37.05 | 37.14 | 36.93 | 36.36 |
| **Cr2O3** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **K2O** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **MgO** | 5.76 | 4.94 | 4.52 | 3.97 | 3.80 | 3.74 | 3.71 | 3.99 | 4.01 | 3.95 | 4.27 | 4.87 | 5.91 | 6.76 | 1.72 | 1.94 | 2.08 | 2.24 | 2.35 | 2.36 | 2.39 | 1.79 | 1.25 |
| **MnO** | 0.30 | 0.37 | 0.70 | 1.05 | 1.25 | 1.33 | 1.54 | 1.46 | 1.20 | 1.19 | 0.97 | 0.64 | 0.54 | 0.38 | 5.18 | 4.06 | 3.13 | 2.53 | 2.67 | 2.73 | 2.74 | 4.29 | 5.39 |
| **CaO** | 4.08 | 3.49 | 3.25 | 2.93 | 2.84 | 2.87 | 2.84 | 2.96 | 2.85 | 2.52 | 3.05 | 3.22 | 3.97 | 4.13 | 0.78 | 0.76 | 0.75 | 0.82 | 0.70 | 0.77 | 0.76 | 0.77 | 0.77 |
| **Al2O3** | 22.00 | 21.80 | 21.99 | 21.51 | 21.65 | 20.86 | 20.55 | 21.70 | 21.50 | 21.28 | 21.36 | 20.99 | 22.66 | 22.60 | 20.46 | 20.42 | 20.42 | 20.68 | 20.65 | 20.64 | 20.39 | 20.51 | 20.58 |
| **TFeO** | 29.21 | 30.88 | 32.17 | 32.08 | 32.19 | 32.81 | 32.55 | 31.97 | 32.56 | 32.53 | 31.21 | 31.24 | 29.49 | 28.26 | 33.96 | 35.60 | 35.62 | 35.73 | 36.42 | 36.01 | 36.36 | 35.47 | 34.59 |
| **TiO2** | 0.00 | 0.00 | 0.06 | 0.09 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 | 0.09 | 0.15 | 0.11 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total** | 99.59 | 99.89 | 100.33 | 99.36 | 99.25 | 99.94 | 99.72 | 99.90 | 99.99 | 99.01 | 99.44 | 99.36 | 100.11 | 100.25 | 99.48 | 99.96 | 99.10 | 99.42 | 99.57 | 99.59 | 99.78 | 99.76 | 98.98 |
| **O** | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 |
| **Na** | 0.00 | 0.03 | 0.03 | 0.03 | 0.03 | 0.02 | 0.02 | 0.02 | 0.05 | 0.03 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 0.02 | 0.01 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 |
| **Si** | 6.00 | 6.02 | 5.93 | 6.00 | 5.99 | 6.09 | 6.12 | 6.00 | 5.99 | 6.00 | 6.09 | 6.07 | 5.87 | 5.90 | 6.09 | 6.04 | 6.06 | 6.08 | 6.00 | 6.04 | 6.05 | 6.04 | 6.01 |
| **Cr** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **K** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Mg** | 1.35 | 1.16 | 1.07 | 0.95 | 0.91 | 0.89 | 0.88 | 0.95 | 0.95 | 0.95 | 1.01 | 1.15 | 1.38 | 1.57 | 0.42 | 0.47 | 0.51 | 0.54 | 0.57 | 0.57 | 0.58 | 0.44 | 0.31 |
| **Mn** | 0.04 | 0.05 | 0.09 | 0.14 | 0.17 | 0.18 | 0.21 | 0.20 | 0.16 | 0.16 | 0.13 | 0.09 | 0.07 | 0.05 | 0.72 | 0.56 | 0.43 | 0.35 | 0.37 | 0.38 | 0.38 | 0.59 | 0.75 |
| **Ca** | 0.69 | 0.59 | 0.55 | 0.50 | 0.49 | 0.49 | 0.49 | 0.50 | 0.49 | 0.43 | 0.52 | 0.55 | 0.67 | 0.69 | 0.14 | 0.13 | 0.13 | 0.14 | 0.12 | 0.13 | 0.13 | 0.13 | 0.14 |
| **Al** | 4.07 | 4.04 | 4.10 | 4.05 | 4.09 | 3.92 | 3.87 | 4.07 | 4.03 | 4.03 | 3.99 | 3.93 | 4.18 | 4.14 | 3.94 | 3.92 | 3.94 | 3.96 | 3.98 | 3.96 | 3.91 | 3.95 | 4.01 |
| **Fe2+** | 3.82 | 4.06 | 4.24 | 4.28 | 4.30 | 4.36 | 4.34 | 4.24 | 4.32 | 4.36 | 4.13 | 4.14 | 3.85 | 3.66 | 4.62 | 4.84 | 4.87 | 4.85 | 4.96 | 4.90 | 4.94 | 4.84 | 4.77 |
| **Ti** | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.01 | 0.02 | 0.01 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Fe3+** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Cations** | 15.97 | 15.96 | 16.02 | 15.96 | 15.98 | 15.96 | 15.94 | 15.97 | 16.00 | 15.98 | 15.90 | 15.95 | 16.04 | 16.02 | 15.93 | 15.99 | 15.97 | 15.94 | 16.02 | 15.99 | 15.99 | 15.99 | 15.98 |
| **Xprp** | 22.85 | 19.81 | 17.89 | 16.12 | 15.47 | 15.01 | 14.93 | 16.06 | 16.06 | 16.03 | 17.44 | 19.45 | 23.11 | 26.24 | 7.10 | 7.85 | 8.55 | 9.23 | 9.49 | 9.59 | 9.62 | 7.27 | 5.16 |
| **Xgrs** | 11.63 | 10.06 | 9.25 | 8.55 | 8.31 | 8.28 | 8.21 | 8.56 | 8.20 | 7.35 | 8.95 | 9.24 | 11.15 | 11.52 | 2.31 | 2.21 | 2.21 | 2.43 | 2.03 | 2.25 | 2.20 | 2.25 | 2.28 |
| **Xalm** | 64.85 | 69.30 | 71.29 | 72.91 | 73.34 | 73.69 | 73.33 | 72.04 | 73.00 | 73.88 | 71.35 | 69.85 | 64.54 | 61.40 | 78.44 | 80.61 | 81.93 | 82.42 | 82.35 | 81.87 | 81.92 | 80.59 | 79.92 |
| **Xsps** | 0.68 | 0.84 | 1.57 | 2.42 | 2.89 | 3.03 | 3.52 | 3.34 | 2.73 | 2.74 | 2.25 | 1.45 | 1.20 | 0.84 | 12.14 | 9.33 | 7.31 | 5.92 | 6.13 | 6.30 | 6.27 | 9.89 | 12.64 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | *GR-17-Line 1* | *Line 2* | *Line 3* | *Line 4* | *Line 5* | *Line 6* | *Line 7* | *Line 8* | *Line 9* | *Line 10* | **Sample** | YA-16-35-Line 1 | Line 2 | Line 3 | Line 4 | Line 5 | Line 6 | 5.1 | 5.2 | 5.3 | 7 | 9 |
|  | *Grt\* (Rim)* | *Grt (Rim)* | *Grt (Rim)* | *Grt (Rim)* | *Grt (Core)* | *Grt (Core)* | *Grt (Core)* | *Grt (Rim)* | *Grt (RIm)* | *Grt (Rim)* |  | Omp | Omp | Omp | Omp | Omp | Omp | Omp\* | Omp | Omp | Omp | Omp |
| **Na2O** | *0.00* | *0.00* | *0.02* | *0.07* | *0.05* | *0.06* | *0.09* | *0.04* | *0.04* | *0.08* | **Na2O** | 8.62 | 8.31 | 8.56 | 8.50 | 8.55 | 8.89 | 8.61 | 8.69 | 7.78 | 8.69 | 8.72 |
| **SiO2** | *37.61* | *37.57* | *38.04* | *37.48* | *37.25* | *37.34* | *37.54* | *37.48* | *37.81* | *38.02* | **SiO2** | 56.12 | 55.93 | 56.19 | 55.96 | 56.28 | 56.69 | 56.20 | 56.23 | 55.86 | 56.27 | 56.56 |
| **Cr2O3** | *0.00* | *0.13* | *0.00* | *0.00* | *0.07* | *0.00* | *0.00* | *0.07* | *0.00* | *0.00* | **Cr2O3** | 0.05 | 0.05 | 0.03 | 0.03 | 0.05 | 0.03 | 0.02 | 0.03 | 0.03 | 0.05 | 0.01 |
| **K2O** | *0.00* | *0.00* | *0.00* | *0.00* | *0.04* | *0.02* | *0.00* | *0.00* | *0.00* | *0.00* | **K2O** | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 |
| **MgO** | *3.67* | *3.02* | *2.79* | *2.50* | *2.15* | *2.01* | *2.00* | *2.37* | *2.58* | *2.96* | **MgO** | 6.32 | 6.91 | 6.16 | 6.07 | 6.24 | 6.37 | 6.16 | 6.19 | 7.25 | 6.16 | 6.38 |
| **MnO** | *0.37* | *0.21* | *0.59* | *0.85* | *1.54* | *1.90* | *1.73* | *1.18* | *0.60* | *0.25* | **MnO** | 0.02 | 0.02 | 0.03 | 0.01 | 0.05 | 0.04 | 0.00 | 0.02 | 0.04 | 0.05 | 0.00 |
| **CaO** | *6.12* | *7.43* | *6.67* | *5.84* | *6.19* | *6.03* | *6.53* | *4.95* | *6.17* | *7.07* | **CaO** | 10.27 | 11.01 | 10.10 | 9.93 | 10.06 | 10.00 | 10.15 | 10.12 | 11.48 | 10.08 | 9.98 |
| **Al2O3** | *21.80* | *21.73* | *21.16* | *21.37* | *21.24* | *21.44* | *20.67* | *21.43* | *20.84* | *21.31* | **Al2O3** | 13.86 | 11.58 | 13.88 | 13.83 | 13.91 | 13.46 | 13.90 | 13.97 | 10.84 | 13.94 | 13.48 |
| **TFeO** | *29.83* | *29.45* | *30.06* | *31.19* | *31.12* | *31.30* | *30.63* | *33.07* | *31.56* | *29.41* | **TFeO** | 4.71 | 5.76 | 4.70 | 4.73 | 4.75 | 4.48 | 4.55 | 4.62 | 5.92 | 4.68 | 4.42 |
| **TiO2** | *0.12* | *0.15* | *0.18* | *0.16* | *0.10* | *0.16* | *0.13* | *0.00* | *0.00* | *0.14* | **TiO2** | 0.11 | 0.11 | 0.14 | 0.14 | 0.13 | 0.05 | 0.12 | 0.10 | 0.04 | 0.12 | 0.04 |
| **Total** | *99.58* | *99.74* | *99.51* | *99.46* | *99.75* | *100.26* | *99.32* | *100.59* | *99.63* | *99.28* | **Total** | 100.13 | 99.68 | 99.81 | 99.20 | 100.04 | 100.02 | 99.75 | 99.97 | 99.26 | 100.07 | 99.60 |
| **O** | *24.0* | *24.0* | *24.0* | *24.0* | *24.0* | *24.0* | *24.0* | *24.0* | *24.0* | *24.0* | **O** | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| **Na** | *0.00* | *0.00* | *0.01* | *0.02* | *0.02* | *0.02* | *0.03* | *0.01* | *0.01* | *0.02* | **Na** | 0.59 | 0.58 | 0.59 | 0.59 | 0.59 | 0.61 | 0.59 | 0.60 | 0.54 | 0.59 | 0.60 |
| **Si** | *5.97* | *5.96* | *6.06* | *6.01* | *5.98* | *5.97* | *6.05* | *5.98* | *6.06* | *6.05* | **Si** | 1.98 | 2.00 | 1.99 | 1.99 | 1.99 | 2.00 | 1.99 | 1.99 | 2.01 | 1.99 | 2.00 |
| **Cr** | *0.00* | *0.02* | *0.00* | *0.00* | *0.01* | *0.00* | *0.00* | *0.01* | *0.00* | *0.00* | **Cr** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **K** | *0.00* | *0.00* | *0.00* | *0.00* | *0.01* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | **K** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Mg** | *0.87* | *0.71* | *0.66* | *0.60* | *0.51* | *0.48* | *0.48* | *0.56* | *0.62* | *0.70* | **Mg** | 0.33 | 0.37 | 0.33 | 0.32 | 0.33 | 0.34 | 0.32 | 0.33 | 0.39 | 0.32 | 0.34 |
| **Mn** | *0.05* | *0.03* | *0.08* | *0.12* | *0.21* | *0.26* | *0.24* | *0.16* | *0.08* | *0.03* | **Mn** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Ca** | *1.04* | *1.26* | *1.14* | *1.00* | *1.06* | *1.03* | *1.13* | *0.85* | *1.06* | *1.21* | **Ca** | 0.39 | 0.42 | 0.38 | 0.38 | 0.38 | 0.38 | 0.39 | 0.38 | 0.44 | 0.38 | 0.38 |
| **Al** | *4.08* | *4.06* | *3.97* | *4.04* | *4.02* | *4.04* | *3.93* | *4.03* | *3.93* | *4.00* | **Al** | 0.58 | 0.49 | 0.58 | 0.58 | 0.58 | 0.56 | 0.58 | 0.58 | 0.46 | 0.58 | 0.56 |
| **Fe2+** | *3.95* | *3.90* | *4.00* | *4.17* | *4.17* | *4.18* | *4.12* | *4.40* | *4.22* | *3.91* | **Fe2+** | 0.08 | 0.06 | 0.11 | 0.12 | 0.11 | 0.07 | 0.10 | 0.09 | 0.09 | 0.09 | 0.09 |
| **Ti** | *0.01* | *0.02* | *0.02* | *0.02* | *0.01* | *0.02* | *0.02* | *0.00* | *0.00* | *0.02* | **Ti** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Fe3+** | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | **Fe3+** | 0.06 | 0.11 | 0.03 | 0.02 | 0.03 | 0.06 | 0.03 | 0.05 | 0.08 | 0.04 | 0.04 |
| **Cations** | *15.97* | *15.97* | *15.94* | *15.97* | *16.00* | *16.00* | *15.98* | *16.01* | *15.98* | *15.94* | **Cations** | 4.02 | 4.04 | 4.01 | 4.01 | 4.01 | 4.02 | 4.01 | 4.02 | 4.03 | 4.02 | 4.01 |
| **Xprp** | *14.69* | *12.10* | *11.28* | *10.15* | *8.64* | *8.06* | *8.06* | *9.44* | *10.31* | *12.01* | **Xjd** | 0.57 | 0.48 | 0.57 | 0.58 | 0.57 | 0.56 | 0.58 | 0.57 | 0.46 | 0.57 | 0.56 |
| **Xgrs** | *17.61* | *21.39* | *19.37* | *17.03* | *17.87* | *17.37* | *18.91* | *14.17* | *17.72* | *20.62* | **Xae** | 0.01 | 0.09 | 0.01 | 0.01 | 0.01 | 0.05 | 0.01 | 0.01 | 0.08 | 0.01 | 0.04 |
| **Xalm** | *66.85* | *66.03* | *68.00* | *70.86* | *69.98* | *70.24* | *69.08* | *73.72* | *70.60* | *66.80* | **XWEF** | 0.42 | 0.43 | 0.42 | 0.42 | 0.42 | 0.40 | 0.41 | 0.41 | 0.46 | 0.41 | 0.40 |
| **Xsps** | *0.84* | *0.48* | *1.35* | *1.96* | *3.51* | *4.33* | *3.96* | *2.67* | *1.36* | *0.58* |  |  |  |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | 11 | 16.1 | 16.2 | 19 | 36 | YA-7-18-47-1-62 | 5 | JM-2-Q1-2 | 4 | 9 | JM-2-10 | 15 | 17 | *37* | *46* | *65* | 67 | 68 | 49 | 50 |
|  | Omp | Omp | Omp | Omp | Omp# (Inc) | Omp | Omp\* | Omp | Omp | Omp | Omp | Omp | Omp | *Omp* | *Omp* | *Omp* | Omp | Omp | Omp\* (Core) | Omp (Rim) |
| **Na2O** | 9.17 | 8.46 | 7.79 | 8.56 | 9.76 | 7.35 | 6.923 | 6.64 | 7.38 | 7.31 | 6.88 | 7.07 | 7.04 | *7.13* | *7.08* | *6.74* | 7.07 | 7.30 | 6.35 | 7.03 |
| **SiO2** | 56.84 | 55.65 | 56.27 | 56.22 | 55.91 | 55.51 | 57.13 | 55.42 | 55.82 | 55.73 | 54.99 | 56.00 | 55.63 | *55.53* | *55.41* | *56.67* | 56.24 | 56.77 | 55.66 | 56.61 |
| **Cr2O3** | 0.01 | 0.03 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.06 | 0.00 | 0.07 | 0.10 | 0.09 | *0.13* | *0.05* | *0.10* | 0.00 | 0.00 | 0.04 | 0.04 |
| **K2O** | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | *0.00* | *0.02* | *0.02* | 0.00 | 0.02 | 0.01 | 0.01 |
| **MgO** | 5.80 | 6.66 | 6.84 | 6.59 | 4.83 | 8.36 | 8.26 | 9.12 | 9.13 | 8.64 | 9.12 | 8.63 | 9.07 | *9.08* | *8.86* | *9.63* | 8.64 | 9.17 | 8.73 | 8.56 |
| **MnO** | 0.01 | 0.03 | 0.02 | 0.00 | 0.08 | 0.01 | 0.02 | 0.00 | 0.00 | 0.08 | 0.06 | 0.00 | 0.00 | *0.00* | *0.00* | *0.04* | 0.00 | 0.00 | 0.02 | 0.02 |
| **CaO** | 9.47 | 10.48 | 10.73 | 10.87 | 8.35 | 12.86 | 12.54 | 12.77 | 11.95 | 11.89 | 12.49 | 12.35 | 12.33 | *12.54* | *12.33* | *12.36* | 12.22 | 12.04 | 14.29 | 13.39 |
| **Al2O3** | 14.13 | 12.86 | 10.73 | 11.09 | 11.19 | 12.05 | 11.30 | 9.14 | 11.01 | 11.63 | 10.76 | 10.56 | 10.34 | *10.23* | *9.96* | *10.56* | 9.03 | 11.02 | 8.35 | 11.27 |
| **TFeO** | 4.24 | 5.69 | 7.16 | 6.36 | 9.69 | 3.67 | 3.45 | 6.09 | 4.11 | 3.74 | 4.72 | 4.87 | 4.62 | *4.35* | *5.12* | *2.91* | 6.86 | 3.25 | 6.88 | 3.97 |
| **TiO2** | 0.06 | 0.09 | 0.06 | 0.06 | 0.15 | 0.07 | 0.06 | 0.00 | 0.11 | 0.13 | 0.07 | 0.00 | 0.15 | *0.15* | *0.13* | *0.10* | 0.00 | 0.09 | 0.02 | 0.05 |
| **Total** | 99.80 | 99.95 | 99.62 | 99.79 | 99.98 | 99.89 | 99.74 | 99.18 | 99.57 | 99.23 | 99.16 | 99.58 | 99.28 | *99.14* | *99.04* | *99.18* | 100.06 | 99.69 | 100.36 | 100.95 |
| **O** | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | *6.0* | *6.0* | *6.0* | 6.0 | 6.0 | 6.0 | 6.0 |
| **Na** | 0.63 | 0.58 | 0.54 | 0.60 | 0.69 | 0.51 | 0.47 | 0.47 | 0.51 | 0.51 | 0.48 | 0.49 | 0.49 | *0.50* | *0.49* | *0.46* | 0.49 | 0.50 | 0.44 | 0.48 |
| **Si** | 2.01 | 1.98 | 2.02 | 2.02 | 2.03 | 1.97 | 2.02 | 2.01 | 1.99 | 1.99 | 1.98 | 2.00 | 2.00 | *1.99* | *2.00* | *2.01* | 2.02 | 2.01 | 2.01 | 1.99 |
| **Cr** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | *0.00* | *0.00* | *0.00* | 0.00 | 0.00 | 0.00 | 0.00 |
| **K** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | *0.00* | *0.00* | *0.00* | 0.00 | 0.00 | 0.00 | 0.00 |
| **Mg** | 0.31 | 0.35 | 0.37 | 0.35 | 0.26 | 0.45 | 0.44 | 0.49 | 0.49 | 0.46 | 0.49 | 0.46 | 0.48 | *0.49* | *0.48* | *0.51* | 0.46 | 0.48 | 0.47 | 0.45 |
| **Mn** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | *0.00* | *0.00* | *0.00* | 0.00 | 0.00 | 0.00 | 0.00 |
| **Ca** | 0.36 | 0.40 | 0.41 | 0.42 | 0.32 | 0.49 | 0.47 | 0.50 | 0.46 | 0.45 | 0.48 | 0.47 | 0.47 | *0.48* | *0.48* | *0.47* | 0.47 | 0.46 | 0.55 | 0.50 |
| **Al** | 0.59 | 0.54 | 0.45 | 0.47 | 0.48 | 0.51 | 0.47 | 0.39 | 0.46 | 0.49 | 0.46 | 0.44 | 0.44 | *0.43* | *0.42* | *0.44* | 0.38 | 0.46 | 0.35 | 0.47 |
| **Fe2+** | 0.09 | 0.06 | 0.16 | 0.06 | 0.07 | 0.03 | 0.10 | 0.09 | 0.03 | 0.06 | 0.05 | 0.09 | 0.06 | *0.04* | *0.06* | *0.09* | 0.10 | 0.07 | 0.10 | 0.08 |
| **Ti** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | *0.00* | *0.00* | *0.00* | 0.00 | 0.00 | 0.00 | 0.00 |
| **Fe3+** | 0.04 | 0.11 | 0.06 | 0.13 | 0.22 | 0.08 | 0.01 | 0.10 | 0.09 | 0.05 | 0.09 | 0.06 | 0.08 | *0.09* | *0.09* | *0.00* | 0.10 | 0.03 | 0.11 | 0.04 |
| **Cations** | 4.01 | 4.04 | 4.02 | 4.05 | 4.07 | 4.03 | 3.98 | 4.03 | 4.03 | 4.01 | 4.03 | 4.02 | 4.03 | *4.03* | *4.03* | *3.99* | 4.03 | 4.01 | 4.04 | 4.01 |
| **Xjd** | 0.59 | 0.53 | 0.46 | 0.46 | 0.47 | 0.49 | 0.48 | 0.38 | 0.45 | 0.48 | 0.45 | 0.44 | 0.43 | *0.43* | *0.42* | *0.45* | 0.38 | 0.46 | 0.35 | 0.46 |
| **Xae** | 0.04 | 0.04 | 0.09 | 0.12 | 0.20 | 0.00 | 0.00 | 0.08 | 0.04 | 0.02 | 0.02 | 0.04 | 0.05 | *0.06* | *0.07* | *0.02* | 0.11 | 0.04 | 0.09 | 0.01 |
| **XWEF** | 0.37 | 0.43 | 0.46 | 0.41 | 0.33 | 0.51 | 0.47 | 0.54 | 0.50 | 0.50 | 0.53 | 0.52 | 0.52 | *0.52* | *0.51* | *0.53* | 0.51 | 0.50 | 0.56 | 0.53 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | *19* | *20* | 51 | 53 | 54 | 59 | 60 | 62 | 63 | YA-7-18-43-3.1 | Glk-7-18-7-5.1 | 3-4 | Ya-16-35-3.1 | 11.1 | 23.1 | 35 | 39.2 | 41 | 25.1 | 39.6 | Ya-7-18-47-1-10 | 60 |
|  | *Omp (Core)* | *Omp (Rim)* | Omp (Inc) | Omp (Inc) | Omp (Inc) | Omp# (Inc) | Omp (Inc) | Omp (Inc) | Omp (Inc) | Omp# (Inc) | Di | Di\* | Mg-Ktp | Mg-Ktp | Mg-Ktp (Inc) | Brs (Inc) | Brs (Inc) | Trm (Inc) | Trm (Inc) | Trm (Inc) | Act | Brs& |
| **Na2O** | *6.87* | *6.91* | 7.16 | 7.14 | 6.42 | 7.15 | 6.99 | 6.44 | 6.95 | 6.56 | 0.08 | 0.31 | 4.91 | 4.89 | 5.48 | 5.84 | 5.63 | 5.40 | 5.07 | 4.83 | 1.13 | 3.58 |
| **SiO2** | *55.31* | *55.49* | 55.27 | 56.14 | 55.22 | 55.92 | 55.88 | 55.91 | 56.18 | 53.84 | 53.52 | 51.60 | 45.95 | 46.39 | 46.08 | 49.75 | 47.01 | 43.66 | 40.21 | 40.46 | 53.58 | 44.00 |
| **Cr2O3** | *0.00* | *0.06* | 0.00 | 0.08 | 0.00 | 0.09 | 0.07 | 0.05 | 0.00 | 0.00 | 0.10 | 0.00 | 0.03 | 0.04 | 0.03 | 0.04 | 0.04 | 0.00 | 0.01 | 0.03 | 0.01 | 0.01 |
| **K2O** | *0.00* | *0.00* | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.42 | 0.51 | 0.38 | 0.25 | 0.14 | 0.12 | 0.11 | 0.14 | 0.11 | 0.06 |
| **MgO** | *9.12* | *8.96* | 8.93 | 8.54 | 9.20 | 7.96 | 8.73 | 9.07 | 8.67 | 6.62 | 11.82 | 11.26 | 9.71 | 10.18 | 8.47 | 9.84 | 7.94 | 6.68 | 5.14 | 6.26 | 12.61 | 9.35 |
| **MnO** | *0.00* | *0.00* | 0.07 | 0.00 | 0.00 | 0.15 | 0.07 | 0.00 | 0.00 | 0.12 | 0.44 | 0.26 | 0.11 | 0.07 | 0.09 | 0.06 | 0.09 | 0.13 | 0.15 | 0.23 | 0.36 | 0.08 |
| **CaO** | *12.47* | *12.33* | 12.57 | 12.08 | 12.42 | 12.10 | 12.34 | 12.95 | 12.23 | 12.12 | 24.44 | 24.11 | 8.07 | 8.12 | 6.59 | 5.31 | 5.51 | 7.05 | 7.14 | 7.64 | 11.09 | 8.87 |
| **Al2O3** | *10.52* | *9.35* | 9.60 | 7.95 | 8.28 | 9.45 | 9.54 | 9.64 | 9.18 | 10.38 | 0.34 | 2.88 | 14.28 | 13.45 | 14.53 | 11.97 | 14.78 | 13.65 | 14.93 | 14.22 | 5.03 | 14.38 |
| **TFeO** | *4.76* | *6.33* | 5.65 | 7.77 | 7.64 | 7.08 | 5.74 | 5.16 | 6.80 | 12.10 | 10.23 | 10.43 | 13.40 | 12.86 | 15.18 | 14.34 | 16.61 | 20.81 | 22.29 | 22.11 | 13.77 | 16.90 |
| **TiO2** | *0.00* | *0.06* | 0.00 | 0.00 | 0.14 | 0.14 | 0.17 | 0.20 | 0.07 | 0.08 | 0.09 | 0.37 | 0.78 | 0.23 | 0.32 | 0.27 | 0.63 | 0.53 | 0.16 | 0.03 | 0.04 | 0.16 |
| **Total** | *99.05* | *99.53* | 99.31 | 99.74 | 99.37 | 100.11 | 99.60 | 99.42 | 100.16 | 101.86 | 101.05 | 101.24 | 97.71 | 96.75 | 97.15 | 97.66 | 98.37 | 98.02 | 95.21 | 95.95 | 97.73 | 97.39 |
| **O** | *6.0* | *6.0* | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 |
| **Na** | *0.48* | *0.48* | 0.50 | 0.50 | 0.45 | 0.50 | 0.49 | 0.45 | 0.48 | 0.46 | 0.01 | 0.02 | 1.39 | 1.39 | 1.56 | 1.63 | 1.59 | 1.58 | 1.55 | 1.46 | 0.31 | 1.03 |
| **Si** | *1.99* | *2.00* | 2.00 | 2.03 | 2.01 | 2.01 | 2.01 | 2.01 | 2.02 | 1.95 | 2.00 | 1.93 | 6.70 | 6.81 | 6.78 | 7.18 | 6.83 | 6.58 | 6.33 | 6.32 | 7.71 | 6.54 |
| **Cr** | *0.00* | *0.00* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **K** | *0.00* | *0.00* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.10 | 0.07 | 0.05 | 0.03 | 0.02 | 0.02 | 0.03 | 0.02 | 0.01 |
| **Mg** | *0.49* | *0.48* | 0.48 | 0.46 | 0.50 | 0.43 | 0.47 | 0.49 | 0.46 | 0.36 | 0.66 | 0.63 | 2.11 | 2.23 | 1.86 | 2.12 | 1.72 | 1.50 | 1.21 | 1.46 | 2.71 | 2.07 |
| **Mn** | *0.00* | *0.00* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.03 | 0.04 | 0.01 |
| **Ca** | *0.48* | *0.48* | 0.49 | 0.47 | 0.48 | 0.47 | 0.48 | 0.50 | 0.47 | 0.47 | 0.98 | 0.96 | 1.26 | 1.28 | 1.04 | 0.82 | 0.86 | 1.14 | 1.20 | 1.28 | 1.71 | 1.41 |
| **Al** | *0.45* | *0.40* | 0.41 | 0.34 | 0.35 | 0.40 | 0.40 | 0.41 | 0.39 | 0.44 | 0.01 | 0.13 | 2.45 | 2.33 | 2.52 | 2.04 | 2.53 | 2.42 | 2.77 | 2.62 | 0.85 | 2.52 |
| **Fe2+** | *0.06* | *0.08* | 0.03 | 0.10 | 0.12 | 0.12 | 0.09 | 0.13 | 0.12 | 0.20 | 0.32 | 0.29 | 1.63 | 1.58 | 1.61 | 1.34 | 1.39 | 1.87 | 1.93 | 1.69 | 1.66 | 1.20 |
| **Ti** | *0.00* | *0.00* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.09 | 0.03 | 0.04 | 0.03 | 0.07 | 0.06 | 0.02 | 0.00 | 0.00 | 0.02 |
| **Fe3+** | *0.08* | *0.11* | 0.14 | 0.13 | 0.11 | 0.09 | 0.08 | 0.02 | 0.09 | 0.16 | 0.00 | 0.03 | 0.00 | 0.00 | 0.26 | 0.39 | 0.63 | 0.75 | 1.01 | 1.20 | 0.00 | 0.86 |
| **Cations** | *4.03* | *4.04* | 4.05 | 4.04 | 4.03 | 4.03 | 4.02 | 4.01 | 4.03 | 4.06 | 3.99 | 4.01 | 15.72 | 15.74 | 15.74 | 15.61 | 15.64 | 15.95 | 16.05 | 16.10 | 15.02 | 15.71 |
| **Xjd** | *0.44* | *0.39* | 0.40 | 0.34 | 0.35 | 0.40 | 0.40 | 0.41 | 0.39 | 0.42 | 0.01 | 0.12 |  |  |  |  |  |  |  |  |  |  |
| **Xae** | *0.03* | *0.08* | 0.09 | 0.16 | 0.10 | 0.10 | 0.08 | 0.04 | 0.09 | 0.02 | 0.00 | 0.00 |  |  |  |  |  |  |  |  |  |  |
| **XWEF** | *0.53* | *0.53* | 0.51 | 0.50 | 0.55 | 0.51 | 0.52 | 0.55 | 0.52 | 0.56 | 0.99 | 0.88 |  |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | YA-7-18-40-4 | JM-2-3 | *Q1-7* | *Q1-11* | *Q2-22* | Q2-47 | *Q2-64* | *Q2-66* | Q1-48 | Q1-49 | JM-2-Q1-52 | Q1-56 | Q1-61 | Glk-7-18-7-1 | 3 | 2.2 | 2.1 | 12 | 13 | 6 |
|  | Mg-Hbl | Brs | *Brs* | *Brs* | *Brs* | Brs | *Brs* | *Brs* | Brs (Inc) | Mg-Ktp | Trm (Inc) | Trm (Inc) | Trm (Inc) | Ts | Ts | Ts& | Ts | Tr | Ts | Tr |
| **Na2O** | 2.10 | 4.62 | *3.38* | *3.47* | *3.84* | 3.94 | *4.06* | *4.09* | 4.17 | 4.48 | 4.27 | 4.65 | 4.26 | 1.84 | 1.93 | 2.03 | 1.60 | 0.36 | 2.06 | 0.13 |
| **SiO2** | 49.53 | 49.38 | *52.08* | *53.29* | *46.11* | 50.24 | *50.80* | *50.14* | 47.93 | 45.55 | 41.17 | 41.70 | 42.24 | 41.73 | 43.43 | 43.05 | 44.59 | 56.43 | 41.08 | 57.79 |
| **Cr2O3** | 0.03 | 0.07 | *0.00* | *0.00* | *0.00* | 0.09 | *0.05* | *0.00* | 0.07 | 0.00 | 0.05 | 0.05 | 0.07 | 0.05 | 0.04 | 0.10 | 0.13 | 0.01 | 0.04 | 0.00 |
| **K2O** | 0.27 | 0.28 | *0.22* | *0.16* | *0.37* | 0.21 | *0.18* | *0.24* | 0.21 | 0.33 | 0.22 | 0.15 | 0.00 | 0.57 | 0.52 | 0.53 | 0.44 | 0.05 | 0.53 | 0.02 |
| **MgO** | 13.16 | 12.55 | *15.27* | *14.91* | *9.90* | 13.37 | *12.41* | *13.15* | 11.87 | 9.00 | 5.34 | 5.71 | 6.73 | 8.68 | 9.92 | 10.01 | 11.18 | 19.12 | 8.57 | 20.06 |
| **MnO** | 0.12 | 0.00 | *0.09* | *0.00* | *0.07* | 0.09 | *0.12* | *0.15* | 0.18 | 0.21 | 0.25 | 0.26 | 0.21 | 0.21 | 0.28 | 0.22 | 0.20 | 0.09 | 0.19 | 0.15 |
| **CaO** | 10.47 | 6.66 | *8.12* | *7.51* | *8.43* | 7.44 | *6.89* | *7.48* | 7.43 | 7.49 | 8.78 | 7.63 | 8.50 | 11.46 | 11.29 | 11.52 | 11.94 | 11.91 | 11.04 | 12.20 |
| **Al2O3** | 8.92 | 11.35 | *8.23* | *7.34* | *12.76* | 9.90 | *10.37* | *9.88* | 10.47 | 13.26 | 16.47 | 14.92 | 14.95 | 17.78 | 14.39 | 15.14 | 12.86 | 2.30 | 18.24 | 0.53 |
| **TFeO** | 12.67 | 12.40 | *10.48* | *11.02* | *15.99* | 12.44 | *12.82* | *12.30* | 14.88 | 16.90 | 20.78 | 21.65 | 19.98 | 15.96 | 16.09 | 15.44 | 14.92 | 7.85 | 16.31 | 7.19 |
| **TiO2** | 0.00 | 0.00 | *0.24* | *0.10* | *0.18* | 0.27 | *0.20* | *0.17* | 0.00 | 0.09 | 0.00 | 0.33 | 0.35 | 0.05 | 0.33 | 0.37 | 0.36 | 0.00 | 0.08 | 0.00 |
| **Total** | 97.27 | 97.31 | *98.11* | *97.88* | *97.69* | 97.99 | *97.90* | *97.60* | 97.28 | 97.31 | 97.33 | 97.05 | 97.29 | 98.34 | 98.21 | 98.43 | 98.19 | 98.32 | 98.17 | 98.27 |
| **O** | 23.0 | 23.0 | *23.0* | *23.0* | *23.0* | 23.0 | *23.0* | *23.0* | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 |
| **Na** | 0.59 | 1.29 | *0.93* | *0.95* | *1.10* | 1.09 | *1.12* | *1.14* | 1.18 | 1.29 | 1.26 | 1.38 | 1.25 | 0.53 | 0.55 | 0.58 | 0.46 | 0.10 | 0.59 | 0.03 |
| **Si** | 7.19 | 7.11 | *7.36* | *7.53* | *6.79* | 7.19 | *7.26* | *7.20* | 7.02 | 6.76 | 6.28 | 6.40 | 6.41 | 6.16 | 6.42 | 6.34 | 6.55 | 7.85 | 6.08 | 8.01 |
| **Cr** | 0.00 | 0.01 | *0.00* | *0.00* | *0.00* | 0.01 | *0.01* | *0.00* | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| **K** | 0.05 | 0.05 | *0.04* | *0.03* | *0.07* | 0.04 | *0.03* | *0.04* | 0.04 | 0.06 | 0.04 | 0.03 | 0.00 | 0.11 | 0.10 | 0.10 | 0.08 | 0.01 | 0.10 | 0.00 |
| **Mg** | 2.85 | 2.69 | *3.22* | *3.14* | *2.17* | 2.85 | *2.64* | *2.82* | 2.59 | 1.99 | 1.21 | 1.31 | 1.52 | 1.91 | 2.19 | 2.20 | 2.45 | 3.96 | 1.89 | 4.15 |
| **Mn** | 0.01 | 0.00 | *0.01* | *0.00* | *0.01* | 0.01 | *0.01* | *0.02* | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.01 | 0.02 | 0.02 |
| **Ca** | 1.63 | 1.03 | *1.23* | *1.14* | *1.33* | 1.14 | *1.05* | *1.15* | 1.17 | 1.19 | 1.44 | 1.25 | 1.38 | 1.81 | 1.79 | 1.82 | 1.88 | 1.77 | 1.75 | 1.81 |
| **Al** | 1.53 | 1.93 | *1.37* | *1.22* | *2.21* | 1.67 | *1.75* | *1.67* | 1.81 | 2.32 | 2.96 | 2.70 | 2.67 | 3.09 | 2.51 | 2.63 | 2.23 | 0.38 | 3.18 | 0.09 |
| **Fe2+** | 1.15 | 0.69 | *0.47* | *0.56* | *1.36* | 0.64 | *0.77* | *0.76* | 0.83 | 1.37 | 2.11 | 1.86 | 1.78 | 1.38 | 1.36 | 1.38 | 1.33 | 0.43 | 1.24 | 0.42 |
| **Ti** | 0.00 | 0.00 | *0.03* | *0.01* | *0.02* | 0.03 | *0.02* | *0.02* | 0.00 | 0.01 | 0.00 | 0.04 | 0.04 | 0.01 | 0.04 | 0.04 | 0.04 | 0.00 | 0.01 | 0.00 |
| **Fe3+** | 0.37 | 0.80 | *0.77* | *0.74* | *0.61* | 0.85 | *0.76* | *0.71* | 0.99 | 0.73 | 0.53 | 0.91 | 0.75 | 0.58 | 0.63 | 0.52 | 0.50 | 0.48 | 0.78 | 0.41 |
| **Cations** | 15.45 | 15.59 | *15.41* | *15.33* | *15.66* | 15.51 | *15.43* | *15.53* | 15.67 | 15.74 | 15.89 | 15.92 | 15.84 | 15.61 | 15.61 | 15.64 | 15.56 | 15.02 | 15.66 | 14.97 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | *Glk-7-18-8-4-1* | *1.1* | *1.2* | *5* | *4* | *20* | *21* | *22* | *3* | *2* | Glk-7-18-6-1-1 | 5 | 6 | 4 | 8 | 8.1 | 9 | 10 | 11 | 10 | *25* |
|  | *Mg-Hbl\** | *Act* | *Act* | *Act* | *Mg-Hbl* | *Mg-Hbl* | *Ts* | *Mg-Hbl* | *Ts* | *Tr* | Mg-Hbl | Tr | Act | Ts | Mg-Hbl | Act | Act | Act | Fe-Hbl | Ts (Inc) | *Mg-Hbl (Inc)* |
| **Na2O** | *1.53* | *0.44* | *0.42* | *0.22* | *1.32* | *0.80* | *1.44* | *0.62* | *1.47* | *0.21* | 0.81 | 0.36 | 0.25 | 2.40 | 1.08 | 0.50 | 0.50 | 0.52 | 0.64 | 2.02 | *1.27* |
| **SiO2** | *45.43* | *56.30* | *54.20* | *55.53* | *45.57* | *49.79* | *44.45* | *52.20* | *44.43* | *57.49* | 51.97 | 56.23 | 56.60 | 42.51 | 50.03 | 53.43 | 53.89 | 54.31 | 48.80 | 42.84 | *46.85* |
| **Cr2O3** | *0.08* | *0.00* | *0.03* | *0.01* | *0.02* | *0.02* | *0.00* | *0.02* | *0.02* | *0.02* | 0.01 | 0.00 | 0.00 | 0.01 | 0.43 | 0.03 | 0.02 | 0.03 | 0.05 | 0.10 | *0.04* |
| **K2O** | *0.34* | *0.10* | *0.10* | *0.05* | *0.32* | *0.18* | *0.37* | *0.12* | *0.32* | *0.06* | 0.07 | 0.03 | 0.05 | 0.36 | 0.14 | 0.05 | 0.10 | 0.06 | 0.61 | 0.14 | *0.18* |
| **MgO** | *10.98* | *18.57* | *16.57* | *17.55* | *11.04* | *13.92* | *10.13* | *15.10* | *9.79* | *19.85* | 15.77 | 19.14 | 18.94 | 9.92 | 14.03 | 16.41 | 16.18 | 16.50 | 7.87 | 8.48 | *11.82* |
| **MnO** | *0.13* | *0.11* | *0.13* | *0.16* | *0.19* | *0.15* | *0.19* | *0.20* | *0.20* | *0.10* | 0.17 | 0.13 | 0.15 | 0.22 | 0.23 | 0.19 | 0.19 | 0.17 | 0.34 | 0.07 | *0.14* |
| **CaO** | *11.17* | *11.73* | *11.25* | *11.84* | *11.20* | *10.97* | *11.35* | *10.56* | *11.06* | *12.07* | 11.52 | 11.86 | 12.14 | 10.42 | 10.69 | 12.09 | 12.02 | 12.13 | 12.08 | 11.46 | *11.49* |
| **Al2O3** | *12.74* | *2.39* | *4.20* | *2.14* | *13.03* | *8.43* | *14.54* | *6.61* | *14.82* | *1.15* | 5.08 | 2.34 | 1.57 | 16.09 | 7.82 | 3.23 | 3.50 | 3.19 | 6.18 | 17.33 | *12.07* |
| **TFeO** | *14.76* | *7.79* | *10.45* | *10.20* | *14.45* | *13.43* | *15.02* | *12.60* | *15.06* | *7.27* | 12.25 | 8.78 | 9.26 | 15.27 | 13.60 | 11.20 | 11.58 | 11.33 | 21.96 | 15.46 | *14.02* |
| **TiO2** | *0.26* | *0.04* | *0.05* | *0.03* | *0.32* | *0.08* | *0.38* | *0.14* | *0.39* | *0.04* | 0.13 | 0.02 | 0.02 | 0.29 | 0.23 | 0.23 | 0.21 | 0.20 | 0.09 | 0.97 | *0.26* |
| **Total** | *97.45* | *97.48* | *97.44* | *97.74* | *97.47* | *97.76* | *97.88* | *98.18* | *97.54* | *98.27* | 97.79 | 98.96 | 98.98 | 97.51 | 98.28 | 97.38 | 98.20 | 98.46 | 98.63 | 98.87 | *98.13* |
| **O** | *23.0* | *23.0* | *23.0* | *23.0* | *23.0* | *23.0* | *23.0* | *23.0* | *23.0* | *23.0* | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | *23.0* |
| **Na** | *0.43* | *0.12* | *0.12* | *0.06* | *0.38* | *0.22* | *0.41* | *0.17* | *0.42* | *0.06* | 0.23 | 0.10 | 0.07 | 0.69 | 0.30 | 0.14 | 0.14 | 0.14 | 0.19 | 0.57 | *0.36* |
| **Si** | *6.68* | *7.88* | *7.69* | *7.85* | *6.68* | *7.19* | *6.52* | *7.43* | *6.53* | *7.96* | 7.46 | 7.80 | 7.87 | 6.29 | 7.20 | 7.66 | 7.66 | 7.69 | 7.33 | 6.24 | *6.79* |
| **Cr** | *0.01* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | *0.00* | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | *0.00* |
| **K** | *0.06* | *0.02* | *0.02* | *0.01* | *0.06* | *0.03* | *0.07* | *0.02* | *0.06* | *0.01* | 0.01 | 0.00 | 0.01 | 0.07 | 0.03 | 0.01 | 0.02 | 0.01 | 0.12 | 0.03 | *0.03* |
| **Mg** | *2.41* | *3.88* | *3.51* | *3.70* | *2.41* | *2.99* | *2.22* | *3.20* | *2.14* | *4.10* | 3.37 | 3.96 | 3.93 | 2.19 | 3.01 | 3.51 | 3.43 | 3.48 | 1.76 | 1.84 | *2.56* |
| **Mn** | *0.02* | *0.01* | *0.02* | *0.02* | *0.02* | *0.02* | *0.02* | *0.02* | *0.02* | *0.01* | 0.02 | 0.02 | 0.02 | 0.03 | 0.03 | 0.02 | 0.02 | 0.02 | 0.04 | 0.01 | *0.02* |
| **Ca** | *1.76* | *1.76* | *1.71* | *1.79* | *1.76* | *1.70* | *1.78* | *1.61* | *1.74* | *1.79* | 1.77 | 1.76 | 1.81 | 1.65 | 1.65 | 1.86 | 1.83 | 1.84 | 1.95 | 1.79 | *1.79* |
| **Al** | *2.21* | *0.39* | *0.70* | *0.36* | *2.25* | *1.43* | *2.51* | *1.11* | *2.57* | *0.19* | 0.86 | 0.38 | 0.26 | 2.81 | 1.33 | 0.55 | 0.59 | 0.53 | 1.09 | 2.98 | *2.06* |
| **Fe2+** | *1.20* | *0.60* | *0.63* | *0.71* | *1.13* | *0.69* | *1.28* | *0.48* | *1.27* | *0.44* | 0.75 | 0.35 | 0.54 | 1.04 | 0.67 | 0.95 | 0.99 | 0.98 | 2.72 | 1.63 | *1.11* |
| **Ti** | *0.03* | *0.00* | *0.00* | *0.00* | *0.03* | *0.01* | *0.04* | *0.02* | *0.04* | *0.00* | 0.01 | 0.00 | 0.00 | 0.03 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.11 | *0.03* |
| **Fe3+** | *0.61* | *0.31* | *0.61* | *0.49* | *0.64* | *0.93* | *0.57* | *1.02* | *0.58* | *0.40* | 0.72 | 0.67 | 0.54 | 0.85 | 0.97 | 0.40 | 0.39 | 0.36 | 0.04 | 0.26 | *0.59* |
| **Cations** | *15.43* | *14.98* | *15.02* | *15.00* | *15.38* | *15.22* | *15.42* | *15.09* | *15.38* | *14.97* | 15.21 | 15.05 | 15.04 | 15.65 | 15.25 | 15.11 | 15.10 | 15.10 | 15.26 | 15.46 | *15.34* |

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| **Sample** | YA-7-18-43-16 | 15 | 23 | 11.2 | 2 | 14.1 | 5 | YA-16-35-6 | 17 | 44 | 43.3 | 43 | 37.2 | Ya-7-18-47-1-9.1 | 9 |
|  | Brs | Brs& | Brs | Mg-Hbl (Inc) | Mg-Hbl | Fe-Brs (Inc) | Fe-Hbl (Inc) | Pg | Pg | Pg | Pg | Ph\* | Ph# (Inc) | Ph\* | Pg |
| **Na2O** | 3.84 | 2.74 | 2.75 | 2.08 | 2.01 | 3.85 | 2.02 | 5.93 | 7.00 | 7.25 | 7.05 | 1.22 | 1.28 | 0.70 | 6.07 |
| **SiO2** | 44.15 | 51.16 | 52.08 | 46.73 | 46.58 | 44.54 | 45.21 | 47.25 | 46.10 | 46.72 | 46.48 | 48.30 | 50.55 | 51.36 | 46.54 |
| **Cr2O3** | 0.02 | 0.00 | 0.00 | 0.13 | 0.06 | 0.05 | 0.08 | 0.04 | 0.00 | 0.03 | 0.04 | 0.02 | 0.04 | 0.04 | 0.06 |
| **K2O** | 0.54 | 0.17 | 0.15 | 0.08 | 0.29 | 0.09 | 0.11 | 0.92 | 1.02 | 0.55 | 0.79 | 9.24 | 8.97 | 9.66 | 1.35 |
| **MgO** | 8.22 | 12.41 | 12.99 | 8.50 | 8.04 | 7.07 | 7.54 | 0.25 | 0.17 | 0.12 | 0.33 | 2.83 | 3.23 | 3.96 | 0.36 |
| **MnO** | 0.13 | 0.10 | 0.14 | 0.11 | 0.19 | 0.11 | 0.11 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.04 | 0.00 | 0.02 |
| **CaO** | 8.17 | 8.22 | 8.30 | 10.24 | 9.78 | 8.13 | 10.05 | 0.34 | 0.27 | 0.43 | 0.46 | 1.02 | 0.26 | 0.03 | 0.29 |
| **Al2O3** | 15.11 | 7.42 | 7.16 | 11.25 | 10.61 | 14.57 | 13.32 | 39.13 | 38.78 | 39.36 | 38.16 | 28.78 | 29.28 | 28.72 | 38.51 |
| **TFeO** | 17.23 | 15.13 | 13.79 | 18.61 | 21.06 | 20.12 | 20.22 | 0.57 | 0.69 | 0.42 | 0.61 | 1.77 | 4.02 | 1.48 | 0.45 |
| **TiO2** | 0.31 | 0.20 | 0.11 | 0.17 | 0.19 | 0.29 | 0.15 | 0.07 | 0.07 | 0.08 | 0.10 | 0.51 | 0.39 | 0.33 | 0.11 |
| **Total** | 97.71 | 97.56 | 97.46 | 97.90 | 98.84 | 98.82 | 98.80 | 94.49 | 94.11 | 94.97 | 94.01 | 93.71 | 98.08 | 96.28 | 93.78 |
| **O** | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| **Na** | 1.10 | 0.77 | 0.77 | 0.60 | 0.58 | 1.11 | 0.58 | 0.74 | 0.88 | 0.90 | 0.89 | 0.16 | 0.16 | 0.09 | 0.76 |
| **Si** | 6.55 | 7.42 | 7.50 | 6.93 | 6.93 | 6.60 | 6.69 | 3.03 | 2.99 | 3.00 | 3.02 | 3.28 | 3.29 | 3.36 | 3.02 |
| **Cr** | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **K** | 0.10 | 0.03 | 0.03 | 0.01 | 0.05 | 0.02 | 0.02 | 0.08 | 0.08 | 0.05 | 0.07 | 0.80 | 0.74 | 0.81 | 0.11 |
| **Mg** | 1.82 | 2.68 | 2.79 | 1.88 | 1.78 | 1.56 | 1.67 | 0.02 | 0.02 | 0.01 | 0.03 | 0.29 | 0.31 | 0.39 | 0.04 |
| **Mn** | 0.02 | 0.01 | 0.02 | 0.01 | 0.02 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Ca** | 1.30 | 1.28 | 1.28 | 1.63 | 1.56 | 1.29 | 1.59 | 0.02 | 0.02 | 0.03 | 0.03 | 0.07 | 0.02 | 0.00 | 0.02 |
| **Al** | 2.64 | 1.27 | 1.22 | 1.97 | 1.86 | 2.54 | 2.32 | 2.96 | 2.97 | 2.97 | 2.92 | 2.30 | 2.25 | 2.22 | 2.95 |
| **Fe2+** | 1.43 | 0.97 | 0.95 | 1.84 | 1.74 | 1.61 | 1.68 | 0.03 | 0.04 | 0.02 | 0.03 | 0.10 | 0.22 | 0.08 | 0.02 |
| **Ti** | 0.03 | 0.02 | 0.01 | 0.02 | 0.02 | 0.03 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.02 | 0.02 | 0.01 |
| **Fe3+** | 0.70 | 0.87 | 0.71 | 0.47 | 0.88 | 0.88 | 0.82 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Cations** | 15.70 | 15.32 | 15.27 | 15.37 | 15.44 | 15.66 | 15.42 | 6.89 | 7.00 | 6.99 | 6.99 | 7.03 | 7.02 | 6.96 | 6.94 |

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| **Sample** | JM-2-28 | *29* | *32* | 33 | *35* | 45 | 34 | 13 | 44 | 12 | 53 | YA-7-18-43-2.1 | 2.2 | 8 | 8.1 | 22 | YA-7-18-44-3 | 4 | 5 | 6 | 7 |
|  | Ph | *Ph* | *Ph* | Ph# (Inc) | *Ph* | Ph | Pg | Pg | Pg | Pg (Inc) | Ph\* | Bt (Inc) | Bt (Inc) | Pg (Inc) | Pg (Inc) | Ph# (Inc) | Ph | Ph | Ph\* | Ph | Ph |
| **Na2O** | 0.25 | *0.24* | *0.38* | 0.64 | *0.24* | 0.96 | 6.66 | 6.21 | 6.11 | 6.63 | 0.33 | 0.18 | 0.33 | 7.23 | 5.19 | 1.09 | 1.60 | 1.44 | 1.27 | 1.48 | 1.27 |
| **SiO2** | 52.43 | *52.75* | *51.87* | 50.84 | *52.55* | 51.84 | 47.89 | 47.58 | 47.81 | 48.24 | 52.24 | 36.90 | 34.96 | 47.36 | 46.78 | 50.76 | 49.31 | 48.57 | 48.79 | 48.44 | 48.25 |
| **Cr2O3** | 0.18 | *0.00* | *0.00* | 0.05 | *0.00* | 0.04 | 0.10 | 0.00 | 0.06 | 0.00 | 0.03 | 0.00 | 0.00 | 0.10 | 0.01 | 0.06 | 0.06 | 0.06 | 0.04 | 0.04 | 0.00 |
| **K2O** | 10.62 | *10.75* | *10.67* | 9.98 | *10.48* | 9.84 | 0.44 | 0.66 | 1.12 | 0.72 | 10.84 | 8.28 | 5.42 | 0.18 | 3.43 | 9.15 | 8.81 | 8.80 | 9.08 | 8.94 | 9.01 |
| **MgO** | 4.80 | *4.37* | *4.99* | 4.19 | *4.75* | 4.29 | 0.11 | 0.16 | 0.30 | 0.25 | 4.20 | 9.76 | 10.09 | 0.13 | 0.17 | 2.72 | 2.04 | 2.16 | 2.38 | 2.26 | 2.24 |
| **MnO** | 0.00 | *0.00* | *0.00* | 0.00 | *0.00* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.10 | 0.15 | 0.04 | 0.06 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **CaO** | 0.00 | *0.00* | *0.00* | 0.00 | *0.00* | 0.00 | 0.20 | 0.26 | 0.07 | 0.16 | 0.06 | 0.18 | 0.31 | 0.31 | 0.42 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Al2O3** | 24.02 | *25.19* | *24.51* | 27.27 | *25.43* | 26.46 | 39.60 | 39.20 | 38.89 | 39.95 | 25.62 | 17.24 | 19.06 | 40.44 | 38.95 | 28.66 | 31.63 | 32.63 | 32.23 | 32.59 | 32.21 |
| **TFeO** | 2.00 | *2.33* | *1.98* | 1.53 | *2.50* | 1.28 | 0.41 | 0.44 | 0.35 | 0.46 | 2.04 | 23.55 | 24.34 | 0.87 | 1.27 | 3.18 | 1.03 | 1.14 | 1.27 | 1.27 | 1.28 |
| **TiO2** | 0.27 | *0.19* | *0.18* | 0.27 | *0.09* | 0.00 | 0.16 | 0.00 | 0.13 | 0.00 | 0.26 | 0.24 | 1.19 | 0.07 | 0.08 | 0.54 | 0.61 | 0.92 | 0.98 | 0.76 | 0.88 |
| **Total** | 94.57 | *95.89* | *94.58* | 94.77 | *96.28* | 94.71 | 95.65 | 94.51 | 94.84 | 96.41 | 95.63 | 96.44 | 95.84 | 96.74 | 96.37 | 96.25 | 95.09 | 95.76 | 96.04 | 95.82 | 95.14 |
| **O** | 11.0 | *11.0* | *11.0* | 11.0 | *11.0* | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| **Na** | 0.03 | *0.03* | *0.05* | 0.08 | *0.03* | 0.12 | 0.82 | 0.77 | 0.76 | 0.81 | 0.04 | 0.03 | 0.05 | 0.88 | 0.64 | 0.14 | 0.20 | 0.18 | 0.16 | 0.19 | 0.16 |
| **Si** | 3.52 | *3.50* | *3.49* | 3.39 | *3.48* | 3.45 | 3.03 | 3.05 | 3.06 | 3.03 | 3.47 | 2.81 | 2.65 | 2.98 | 3.00 | 3.35 | 3.26 | 3.19 | 3.20 | 3.18 | 3.19 |
| **Cr** | 0.01 | *0.00* | *0.00* | 0.00 | *0.00* | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **K** | 0.91 | *0.91* | *0.92* | 0.85 | *0.89* | 0.84 | 0.04 | 0.05 | 0.09 | 0.06 | 0.92 | 0.80 | 0.52 | 0.01 | 0.28 | 0.77 | 0.74 | 0.74 | 0.76 | 0.75 | 0.76 |
| **Mg** | 0.48 | *0.43* | *0.50* | 0.42 | *0.47* | 0.43 | 0.01 | 0.02 | 0.03 | 0.02 | 0.42 | 1.11 | 1.14 | 0.01 | 0.02 | 0.27 | 0.20 | 0.21 | 0.23 | 0.22 | 0.22 |
| **Mn** | 0.00 | *0.00* | *0.00* | 0.00 | *0.00* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Ca** | 0.00 | *0.00* | *0.00* | 0.00 | *0.00* | 0.00 | 0.01 | 0.02 | 0.00 | 0.01 | 0.00 | 0.01 | 0.03 | 0.02 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Al** | 1.90 | *1.97* | *1.94* | 2.14 | *1.99* | 2.08 | 2.95 | 2.96 | 2.93 | 2.96 | 2.01 | 1.55 | 1.70 | 3.00 | 2.94 | 2.23 | 2.46 | 2.52 | 2.49 | 2.52 | 2.51 |
| **Fe2+** | 0.11 | *0.13* | *0.11* | 0.09 | *0.14* | 0.07 | 0.02 | 0.02 | 0.02 | 0.02 | 0.11 | 1.50 | 1.54 | 0.05 | 0.07 | 0.18 | 0.06 | 0.06 | 0.07 | 0.07 | 0.07 |
| **Ti** | 0.01 | *0.01* | *0.01* | 0.01 | *0.00* | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.07 | 0.00 | 0.00 | 0.03 | 0.03 | 0.05 | 0.05 | 0.04 | 0.04 |
| **Fe3+** | 0.00 | *0.00* | *0.00* | 0.00 | *0.00* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Cations** | 6.98 | *6.98* | *7.01* | 6.99 | *7.04* | 6.99 | 6.90 | 6.89 | 6.90 | 6.92 | 6.99 | 7.82 | 7.72 | 6.96 | 6.99 | 6.96 | 6.96 | 6.96 | 6.97 | 6.98 | 6.97 |

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| **Sample** | YA-7-18-44-8 | 9 | 12 | 14 | 2-4 | 2-5 | 2-8 | 17YA-18-9 | 10 | 11 | 14 | 29 | 19 | 23 | 24 | 28 | 5 | 13 | 17 |
|  | Ph | Ph | Ph | Ph | Ph | Ph | Pg | Ms | Ms | Ms\* | Ms& | Ms | Bt1\* | Bt1 | Bt1 | Bt1 | Bt2& | Bt2& | Bt2& |
| **Na2O** | 1.50 | 1.38 | 1.32 | 1.37 | 1.08 | 1.15 | 6.23 | 0.63 | 0.64 | 0.55 | 0.66 | 0.60 | 0.19 | 0.20 | 0.16 | 0.13 | 0.13 | 0.17 | 0.15 |
| **SiO2** | 48.54 | 48.60 | 48.58 | 48.49 | 48.76 | 49.65 | 40.25 | 46.14 | 47.33 | 43.42 | 46.37 | 44.96 | 35.43 | 34.88 | 35.39 | 34.32 | 35.03 | 34.89 | 34.38 |
| **Cr2O3** | 0.00 | 0.05 | 0.05 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.12 | 0.05 | 0.09 | 0.00 | 0.00 | 0.00 | 0.11 |
| **K2O** | 8.88 | 8.90 | 8.84 | 9.22 | 9.40 | 9.36 | 0.17 | 10.33 | 10.13 | 10.02 | 10.57 | 10.61 | 9.42 | 10.07 | 9.86 | 9.69 | 9.64 | 9.61 | 9.11 |
| **MgO** | 2.20 | 2.13 | 2.09 | 2.39 | 1.50 | 1.56 | 0.06 | 0.52 | 0.53 | 0.73 | 0.61 | 0.56 | 5.76 | 6.06 | 5.80 | 6.49 | 6.70 | 6.72 | 6.72 |
| **MnO** | 0.05 | 0.00 | 0.00 | 0.00 | 0.04 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.20 | 0.22 | 0.18 | 0.26 | 0.14 | 0.12 | 0.15 |
| **CaO** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.43 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Al2O3** | 32.52 | 31.90 | 31.97 | 31.47 | 31.90 | 30.88 | 45.59 | 35.18 | 35.66 | 36.98 | 34.54 | 36.14 | 19.10 | 19.30 | 18.84 | 18.81 | 20.02 | 19.56 | 19.52 |
| **TFeO** | 1.14 | 1.15 | 1.53 | 1.27 | 1.16 | 1.36 | 0.54 | 1.14 | 1.22 | 1.35 | 1.40 | 1.15 | 22.50 | 21.77 | 22.40 | 23.03 | 22.97 | 23.87 | 24.85 |
| **TiO2** | 0.69 | 0.81 | 1.14 | 1.00 | 0.94 | 1.02 | 0.00 | 0.36 | 0.21 | 0.15 | 0.32 | 0.71 | 2.45 | 2.80 | 3.20 | 2.51 | 0.90 | 0.93 | 0.75 |
| **Total** | 95.74 | 95.29 | 95.58 | 95.21 | 94.88 | 95.15 | 95.41 | 94.38 | 95.76 | 93.47 | 94.47 | 94.79 | 95.17 | 95.40 | 95.92 | 95.24 | 95.78 | 95.92 | 95.74 |
| **O** | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| **Na** | 0.19 | 0.18 | 0.17 | 0.18 | 0.14 | 0.15 | 0.78 | 0.08 | 0.08 | 0.07 | 0.09 | 0.08 | 0.03 | 0.03 | 0.02 | 0.02 | 0.02 | 0.03 | 0.02 |
| **Si** | 3.20 | 3.22 | 3.20 | 3.21 | 3.24 | 3.29 | 2.60 | 3.09 | 3.12 | 2.96 | 3.12 | 3.01 | 2.74 | 2.70 | 2.72 | 2.68 | 2.71 | 2.70 | 2.68 |
| **Cr** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 |
| **K** | 0.75 | 0.75 | 0.74 | 0.78 | 0.80 | 0.79 | 0.01 | 0.88 | 0.85 | 0.87 | 0.91 | 0.91 | 0.93 | 0.99 | 0.97 | 0.96 | 0.95 | 0.95 | 0.90 |
| **Mg** | 0.22 | 0.21 | 0.21 | 0.24 | 0.15 | 0.15 | 0.01 | 0.05 | 0.05 | 0.07 | 0.06 | 0.06 | 0.66 | 0.70 | 0.67 | 0.75 | 0.77 | 0.78 | 0.78 |
| **Mn** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.01 |
| **Ca** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Al** | 2.53 | 2.49 | 2.48 | 2.46 | 2.50 | 2.41 | 3.47 | 2.78 | 2.77 | 2.97 | 2.73 | 2.86 | 1.74 | 1.76 | 1.71 | 1.73 | 1.83 | 1.78 | 1.79 |
| **Fe2+** | 0.06 | 0.06 | 0.08 | 0.07 | 0.06 | 0.08 | 0.03 | 0.06 | 0.07 | 0.08 | 0.08 | 0.06 | 1.45 | 1.40 | 1.44 | 1.50 | 1.48 | 1.54 | 1.61 |
| **Ti** | 0.03 | 0.04 | 0.06 | 0.05 | 0.05 | 0.05 | 0.00 | 0.02 | 0.01 | 0.01 | 0.02 | 0.04 | 0.14 | 0.16 | 0.19 | 0.15 | 0.05 | 0.05 | 0.04 |
| **Fe3+** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Cations** | 7.04 | 7.03 | 6.95 | 6.98 | 6.96 | 6.95 | 7.09 | 6.98 | 6.95 | 7.08 | 7.00 | 7.01 | 7.72 | 7.77 | 7.73 | 7.80 | 7.89 | 7.84 | 7.85 |

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| **Sample** | GR-17-72 | 73 | 74 | 75 | 76 | 77 | **Sample** | Glk-7-18-7-11 | *61* | *75* | 91 | 62 | 78 | 79 | *36* | *Glk-7-18-8-23* | Glk-7-18-6-5.2 | 9 | YA-7-18-43-2.4 | 21 | YA-7-18-47-1-61 | 63 | 71 | YA-7-18-40-1 |
|  | Ms& (Inc) | Ms& (Inc) | Ms& around Grt | Ph\* | Ph\* | Ph\* |  | Pl1 | Pl1 | Pl1\* | Pl1 | Pl2 | Pl2& | Pl2& | *Ab* | *Pl\** | Pl\* | Kfs | Ab | Ab& around Grt | Ab | Ab& | Ab | Ab& |
| **Na2O** | 0.92 | 0.73 | 0.47 | 0.28 | 0.43 | 0.28 | **Na2O** | 8.70 | 7.87 | 9.35 | 9.18 | 7.98 | 7.27 | 7.37 | 11.16 | *8.83* | 9.19 | 0.36 | 11.67 | 11.80 | 12.01 | 11.87 | 11.83 | 10.82 |
| **SiO2** | 47.94 | 46.06 | 46.80 | 51.37 | 51.50 | 52.05 | **SiO2** | 61.98 | 62.17 | 63.97 | 63.23 | 61.64 | 60.00 | 59.68 | 68.48 | *63.03* | 64.47 | 65.08 | 68.52 | 68.41 | 68.20 | 66.53 | 66.89 | 67.51 |
| **Cr2O3** | 0.16 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | **Cr2O3** | 0.03 | 0.01 | 0.02 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | *0.00* | 0.02 | 0.00 | 0.00 | 0.01 | 0.00 | 0.02 | 0.01 | 0.00 |
| **K2O** | 9.23 | 9.52 | 10.49 | 10.09 | 9.88 | 9.98 | **K2O** | 0.18 | 0.28 | 0.32 | 0.26 | 0.22 | 0.22 | 0.20 | 0.08 | *0.08* | 0.08 | 16.17 | 0.08 | 0.04 | 0.05 | 0.04 | 0.04 | 0.04 |
| **MgO** | 0.50 | 0.56 | 1.02 | 3.68 | 3.12 | 3.41 | **MgO** | 0.08 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | *0.00* | 0.00 | 0.00 | 0.19 | 0.13 | 0.00 | 0.01 | 0.03 | 0.00 |
| **MnO** | 0.00 | 0.05 | 0.00 | 0.00 | 0.05 | 0.00 | **MnO** | 0.03 | 0.02 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | *0.00* | 0.01 | 0.00 | 0.03 | 0.01 | 0.01 | 0.00 | 0.02 | 0.04 |
| **CaO** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | **CaO** | 5.51 | 5.67 | 4.22 | 4.50 | 6.26 | 6.93 | 7.15 | 0.57 | *5.40* | 3.84 | 0.04 | 0.32 | 0.71 | 0.21 | 1.26 | 0.35 | 1.45 |
| **Al2O3** | 35.36 | 36.66 | 34.68 | 27.44 | 28.12 | 27.75 | **Al2O3** | 22.97 | 23.20 | 22.45 | 22.57 | 23.87 | 24.46 | 24.62 | 19.94 | *23.43* | 22.00 | 17.91 | 20.55 | 20.45 | 20.57 | 20.73 | 20.36 | 20.76 |
| **TFeO** | 0.83 | 1.09 | 1.20 | 1.84 | 2.26 | 2.02 | **TFeO** | 0.94 | 0.22 | 0.34 | 0.31 | 0.30 | 0.37 | 0.38 | 0.10 | *0.11* | 0.73 | 0.18 | 1.36 | 1.22 | 0.55 | 0.14 | 0.16 | 0.24 |
| **TiO2** | 0.11 | 0.17 | 0.41 | 0.29 | 0.20 | 0.24 | **TiO2** | 0.04 | 0.01 | 0.00 | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | *0.00* | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 |
| **Total** | 95.05 | 94.97 | 95.10 | 94.99 | 95.56 | 95.78 | **Total** | 100.45 | 99.46 | 100.69 | 100.07 | 100.28 | 99.31 | 99.42 | 100.34 | *100.87* | 100.33 | 99.79 | 102.74 | 102.76 | 101.62 | 100.62 | 99.69 | 100.86 |
| **O** | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | **O** | 8.0 | 8.00 | 8.00 | 8.00 | 8.00 | 8.00 | 8.00 | 8.00 | *8.0* | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| **Na** | 0.12 | 0.09 | 0.06 | 0.04 | 0.06 | 0.04 | **Na** | 0.75 | 0.68 | 0.80 | 0.79 | 0.69 | 0.63 | 0.64 | 0.94 | *0.75* | 0.79 | 0.03 | 0.97 | 0.98 | 1.01 | 1.01 | 1.01 | 0.91 |
| **Si** | 3.16 | 3.05 | 3.12 | 3.42 | 3.41 | 3.43 | **Si** | 2.75 | 2.77 | 2.82 | 2.80 | 2.73 | 2.69 | 2.68 | 2.98 | *2.77* | 2.84 | 3.01 | 2.94 | 2.94 | 2.95 | 2.91 | 2.94 | 2.93 |
| **Cr** | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | **Cr** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | *0.00* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **K** | 0.78 | 0.81 | 0.89 | 0.86 | 0.83 | 0.84 | **K** | 0.01 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | *0.00* | 0.00 | 0.96 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Mg** | 0.05 | 0.06 | 0.10 | 0.36 | 0.31 | 0.33 | **Mg** | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | *0.00* | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Mn** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | **Mn** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | *0.00* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Ca** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | **Ca** | 0.26 | 0.27 | 0.20 | 0.21 | 0.30 | 0.33 | 0.34 | 0.03 | *0.25* | 0.18 | 0.00 | 0.01 | 0.03 | 0.01 | 0.06 | 0.02 | 0.07 |
| **Al** | 2.75 | 2.86 | 2.72 | 2.15 | 2.19 | 2.15 | **Al** | 1.20 | 1.22 | 1.16 | 1.18 | 1.25 | 1.29 | 1.30 | 1.02 | *1.21* | 1.14 | 0.98 | 1.04 | 1.03 | 1.05 | 1.07 | 1.06 | 1.06 |
| **Fe2+** | 0.05 | 0.06 | 0.07 | 0.10 | 0.12 | 0.11 | **Fe2+** | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | *0.00* | 0.03 | 0.01 | 0.05 | 0.04 | 0.02 | 0.01 | 0.01 | 0.01 |
| **Ti** | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.01 | **Ti** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | *0.00* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Fe3+** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | **Fe3+** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | *0.00* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Cations** | 6.91 | 6.95 | 6.98 | 6.94 | 6.93 | 6.92 | **Cations** | 5.02 | 4.97 | 5.01 | 5.01 | 4.99 | 4.98 | 4.99 | 4.99 | *5.00* | 4.98 | 4.99 | 5.03 | 5.04 | 5.03 | 5.06 | 5.03 | 4.99 |
|  |  |  |  |  |  |  | **an** | 0.26 | 0.28 | 0.20 | 0.21 | 0.30 | 0.34 | 0.34 | 0.03 | *0.25* | 0.19 | 0.00 | 0.01 | 0.03 | 0.01 | 0.06 | 0.02 | 0.07 |
|  |  |  |  |  |  |  | **ab** | 0.73 | 0.70 | 0.79 | 0.78 | 0.69 | 0.65 | 0.64 | 0.97 | *0.74* | 0.81 | 0.03 | 0.98 | 0.97 | 0.99 | 0.94 | 0.98 | 0.93 |
|  |  |  |  |  |  |  | **or** | 0.01 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | *0.00* | 0.00 | 0.97 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | YA-7-18-44-6 | 7 | 17YA-18-3 | 4 | 6 | 12 | 16 | 18 | 20 | 21 | 22 | 25 | 27 |
|  | Ab\* | Pl | Kfs | Kfs | Kfs | Pl | Pl | Pl | Pl | Pl | Kfs | Kfs | Kfs |
| **Na2O** | 10.09 | 10.00 | 1.65 | 1.65 | 1.40 | 10.13 | 10.02 | 9.63 | 9.60 | 9.55 | 1.74 | 1.91 | 1.80 |
| **SiO2** | 67.27 | 64.36 | 64.56 | 64.03 | 64.82 | 64.21 | 64.41 | 62.49 | 63.44 | 63.79 | 64.62 | 64.16 | 64.74 |
| **Cr2O3** | 0.00 | 0.00 | 0.11 | 0.00 | 0.00 | 0.04 | 0.12 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 |
| **K2O** | 0.05 | 0.10 | 14.46 | 14.73 | 15.34 | 0.23 | 0.20 | 0.21 | 0.23 | 0.34 | 14.61 | 14.62 | 14.56 |
| **MgO** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **MnO** | 0.00 | 0.05 | 0.04 | 0.04 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 |
| **CaO** | 1.99 | 3.78 | 0.00 | 0.00 | 0.00 | 2.92 | 2.97 | 3.36 | 3.40 | 3.36 | 0.00 | 0.00 | 0.00 |
| **Al2O3** | 20.25 | 20.98 | 18.53 | 18.88 | 18.13 | 21.83 | 21.21 | 22.84 | 22.58 | 22.35 | 18.57 | 18.86 | 18.58 |
| **TFeO** | 0.16 | 0.04 | 0.00 | 0.06 | 0.14 | 0.00 | 0.35 | 0.12 | 0.20 | 0.00 | 0.00 | 0.08 | 0.00 |
| **TiO2** | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total** | 99.81 | 99.39 | 99.46 | 99.54 | 99.97 | 99.44 | 99.49 | 98.81 | 99.58 | 99.46 | 99.66 | 99.79 | 99.89 |
| **O** | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| **Na** | 0.86 | 0.86 | 0.15 | 0.15 | 0.13 | 0.87 | 0.86 | 0.84 | 0.83 | 0.82 | 0.16 | 0.17 | 0.16 |
| **Si** | 2.95 | 2.86 | 2.98 | 2.96 | 2.99 | 2.85 | 2.86 | 2.79 | 2.81 | 2.83 | 2.98 | 2.96 | 2.99 |
| **Cr** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **K** | 0.00 | 0.01 | 0.85 | 0.87 | 0.90 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.86 | 0.86 | 0.86 |
| **Mg** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Mn** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Ca** | 0.09 | 0.18 | 0.00 | 0.00 | 0.00 | 0.14 | 0.14 | 0.16 | 0.16 | 0.16 | 0.00 | 0.00 | 0.00 |
| **Al** | 1.05 | 1.10 | 1.01 | 1.03 | 0.99 | 1.14 | 1.11 | 1.20 | 1.18 | 1.17 | 1.01 | 1.03 | 1.01 |
| **Fe2+** | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Ti** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Fe3+** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Cations** | 4.96 | 5.02 | 5.00 | 5.02 | 5.02 | 5.02 | 5.01 | 5.02 | 5.01 | 5.00 | 5.01 | 5.03 | 5.04 |
| **an** | 0.10 | 0.17 | 0.00 | 0.00 | 0.00 | 0.14 | 0.14 | 0.16 | 0.16 | 0.16 | 0.00 | 0.00 | 0.00 |
| **ab** | 0.90 | 0.82 | 0.15 | 0.15 | 0.12 | 0.85 | 0.85 | 0.83 | 0.83 | 0.82 | 0.15 | 0.17 | 0.16 |
| **or** | 0.00 | 0.01 | 0.85 | 0.85 | 0.88 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.85 | 0.83 | 0.84 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | JM-2-1 | 6 | Q2-23 | Q2-24 | Q2-25 | Q2-26 | Q2-27 | Q1-55 | YA-16-35-9.2 | 32 | 28 | YA-7-18-47-1-7 | YA-7-18-43-11.1 | 10.1 | 5 | 9.1 | 9.3 | 7 | 13 | Glk-7-18-7-8 | *Glk-7-18-8-10* |
|  | Ep | Ep | Ep-line | Ep-line | Ep-line | Ep-line | Ep-line | Ep (Inc) | Ep | Ep (Inc) | Ep (Inc) | Ep (Inc) | Ep (Inc) | Ep (Inc) | Ep (Inc) | Ep (Inc) | Ep (Inc) | Ep (Inc) | Ep (Inc) | Ep (Inc) | *Ep (Inc)* |
| **Na2O** | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.06 | 0.03 | 0.10 | 0.13 | 0.09 | 0.04 | 0.07 | 0.02 | 0.03 | 0.02 | 0.00 | *0.00* |
| **SiO2** | 38.63 | 39.12 | 38.68 | 39.43 | 39.07 | 39.29 | 38.81 | 39.27 | 39.14 | 38.44 | 39.02 | 37.43 | 38.19 | 39.76 | 39.65 | 39.29 | 39.27 | 38.96 | 39.33 | 38.54 | *39.46* |
| **Cr2O3** | 0.00 | 0.10 | 0.07 | 0.00 | 0.00 | 0.11 | 0.11 | 0.08 | 0.03 | 0.00 | 0.02 | 0.02 | 0.15 | 0.00 | 0.04 | 0.01 | 0.01 | 0.00 | 0.00 | 0.17 | *0.00* |
| **K2O** | 0.00 | 0.00 | 0.03 | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.04 | 0.00 | 0.00 | 0.01 | 0.00 | 0.02 | 0.00 | 0.00 | *0.00* |
| **MgO** | 0.14 | 0.18 | 0.05 | 0.18 | 0.20 | 0.19 | 0.18 | 0.20 | 0.17 | 0.23 | 0.20 | 0.31 | 0.18 | 0.13 | 0.10 | 0.12 | 0.37 | 0.12 | 0.14 | 0.00 | *0.00* |
| **MnO** | 0.07 | 0.00 | 0.00 | 0.10 | 0.04 | 0.00 | 0.00 | 0.05 | 0.00 | 0.06 | 0.03 | 0.13 | 0.09 | 0.30 | 0.24 | 0.25 | 0.30 | 0.14 | 0.15 | 0.22 | *0.25* |
| **CaO** | 21.47 | 21.74 | 21.75 | 21.62 | 21.80 | 21.73 | 21.62 | 22.03 | 22.96 | 21.96 | 22.89 | 21.58 | 22.08 | 22.41 | 22.59 | 22.59 | 22.61 | 22.76 | 22.84 | 23.31 | *23.23* |
| **Al2O3** | 29.09 | 28.15 | 27.18 | 29.54 | 29.46 | 29.40 | 28.69 | 29.51 | 28.54 | 27.01 | 28.05 | 23.60 | 26.84 | 29.92 | 29.09 | 29.43 | 28.54 | 28.16 | 28.53 | 26.11 | *28.46* |
| **TFeO** | 6.75 | 6.97 | 8.45 | 5.81 | 5.57 | 6.17 | 6.97 | 5.72 | 5.70 | 6.87 | 6.92 | 11.63 | 8.27 | 5.80 | 6.66 | 6.12 | 6.96 | 7.10 | 6.61 | 8.46 | *6.70* |
| **TiO2** | 0.10 | 0.19 | 0.10 | 0.11 | 0.00 | 0.06 | 0.08 | 0.24 | 0.14 | 0.05 | 0.14 | 0.17 | 0.15 | 0.22 | 0.16 | 0.16 | 0.87 | 0.16 | 0.15 | 0.53 | *0.18* |
| **Total** | 96.34 | 96.58 | 96.38 | 96.85 | 96.20 | 97.06 | 96.55 | 97.14 | 96.67 | 94.68 | 97.29 | 94.99 | 96.13 | 98.62 | 98.57 | 98.04 | 98.96 | 97.45 | 97.79 | 97.35 | *98.28* |
| **O** | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 | *12.5* |
| **Na** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | *0.00* |
| **Si** | 3.06 | 3.09 | 3.09 | 3.09 | 3.08 | 3.08 | 3.07 | 3.07 | 3.08 | 3.11 | 3.08 | 3.11 | 3.07 | 3.07 | 3.07 | 3.06 | 3.05 | 3.07 | 3.08 | 3.08 | *3.08* |
| **Cr** | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | *0.00* |
| **K** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | *0.00* |
| **Mg** | 0.02 | 0.02 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 | 0.02 | 0.04 | 0.02 | 0.01 | 0.01 | 0.01 | 0.04 | 0.01 | 0.02 | 0.00 | *0.00* |
| **Mn** | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | *0.02* |
| **Ca** | 1.82 | 1.84 | 1.86 | 1.81 | 1.84 | 1.82 | 1.83 | 1.84 | 1.94 | 1.90 | 1.93 | 1.92 | 1.90 | 1.85 | 1.88 | 1.88 | 1.88 | 1.92 | 1.92 | 1.99 | *1.94* |
| **Al** | 2.71 | 2.62 | 2.56 | 2.72 | 2.74 | 2.71 | 2.67 | 2.72 | 2.65 | 2.58 | 2.61 | 2.31 | 2.55 | 2.72 | 2.66 | 2.70 | 2.61 | 2.62 | 2.63 | 2.46 | *2.62* |
| **Fe2+** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | *0.00* |
| **Ti** | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.05 | 0.01 | 0.01 | 0.03 | *0.01* |
| **Fe3+** | 0.45 | 0.46 | 0.56 | 0.38 | 0.37 | 0.40 | 0.46 | 0.37 | 0.38 | 0.47 | 0.46 | 0.81 | 0.56 | 0.37 | 0.43 | 0.40 | 0.45 | 0.47 | 0.43 | 0.57 | *0.44* |
| **Cations** | 8.07 | 8.07 | 8.11 | 8.04 | 8.05 | 8.05 | 8.08 | 8.05 | 8.08 | 8.10 | 8.11 | 8.23 | 8.15 | 8.07 | 8.09 | 8.09 | 8.10 | 8.12 | 8.10 | 8.16 | *8.10* |
| **Pistacite** | 0.14 | 0.15 | 0.18 | 0.12 | 0.12 | 0.13 | 0.15 | 0.12 | 0.12 | 0.15 | 0.15 | 0.26 | 0.18 | 0.12 | 0.14 | 0.13 | 0.15 | 0.15 | 0.14 | 0.19 | *0.14* |

Notes: "\*" means minerals used for the P-T calculation of peak metamorphism; "&" means minerals used for the P-T calculation of retrograde metamorphism; "#" means minerals used for P-T calculation of prograde metamorphism. "TFeO" means total FeO. "Inc" represents inclusions. Fe3+ of Garnet is regarded as 0; Fe3+ estimation of omphacite is based on stoichimetric and charge balance; Fe3+ of amphibole is based on Leak et al. (1997); Fe3+ of mica is regarded as 0. WEF: wollastonite + enstatite + ferrosilite. Data in italic are from Jin et al. (2019). Underlined numbers (e.g., YA-7-18-47-1-61) were determined by JEOL JXA-8530FPlus microprobe, whereas other minerals were analyzed by JEOL-8100 microprobe.