**Table S1**. Representative olivine analyses of peridotite and pyroxenite from the Suru-Thasgam ophiolitic slice, western Ladakh

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Peridotites | | | | | | Pyroxenites | | | | | | | | | |
| Samples | DP3 | | DP4 | | DP5 | | TG11 | | TG12 | | TG13 | | TG14 | | TG15 | |
| Points | P-5 | P-6 | P-7 | P-8 | P-9 | P-10 | P-52 | P-72 | P-55 | P-54 | P-86 | P-89 | P-16 | P-17 | P-26 | P-27 |
| SiO2 | 39.89 | 40.88 | 40.72 | 41.41 | 41.28 | 41.10 | 40.23 | 41.10 | 39.63 | 41.11 | 40.74 | 39.91 | 40.17 | 40.29 | 40.88 | 40.56 |
| TiO2 | 0.02 | 0.05 | 0.02 | 0.05 | 0.04 | 0.02 | 0.02 | 0.00 | 0.02 | 0.00 | 0.04 | 0.03 | 0.02 | 0.00 | 0.03 | 0.00 |
| Al2O3 | 0.04 | 0.01 | 0.03 | 0.01 | 0.04 | 0.02 | 0.07 | 0.01 | 0.14 | 0.02 | 0.01 | 0.02 | 0.62 | 0.02 | 0.01 | 0.03 |
| Cr2O3 | 0.02 | 0.02 | 0.00 | 0.00 | 0.01 | 0.03 | 0.12 | 0.06 | 0.14 | 0.03 | 0.08 | 0.15 | 0.06 | 0.09 | 0.08 | 0.03 |
| Fe2O3 | 0.86 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.49 | 0.00 | 0.41 | 0.00 | 0.02 | 0.58 | 0.00 | 0.25 | 0.00 | 0.47 |
| FeO | 10.17 | 10.15 | 10.35 | 10.07 | 10.72 | 10.07 | 9.44 | 10.09 | 9.90 | 9.06 | 9.69 | 9.84 | 11.03 | 9.51 | 10.79 | 10.29 |
| MnO | 0.06 | 0.08 | 0.16 | 0.23 | 0.10 | 0.12 | 0.02 | 0.16 | 0.22 | 0.17 | 0.13 | 0.13 | 0.29 | 0.26 | 0.13 | 0.05 |
| MgO | 47.99 | 48.33 | 48.39 | 48.62 | 47.58 | 48.17 | 48.62 | 48.24 | 48.80 | 48.54 | 48.41 | 48.27 | 47.39 | 48.70 | 47.42 | 47.51 |
| CaO | 0.06 | 0.04 | 0.04 | 0.04 | 0.10 | 0.06 | 0.35 | 0.23 | 0.34 | 0.35 | 0.35 | 0.35 | 0.33 | 0.37 | 0.34 | 0.35 |
| Total | 99.10 | 99.56 | 99.70 | 100 | 99.89 | 99.57 | 99.37 | 99.89 | 99.59 | 99.24 | 99.47 | 99.29 | 99.92 | 99.50 | 99.68 | 99.27 |
| Cations | *Based on 4 Oxygen* | | | | | | | | | | | | | | | |
| Si4+ | 0.99 | 1.01 | 1.00 | 1.01 | 1.02 | 1.01 | 0.99 | 1.01 | 0.98 | 1.01 | 1.00 | 0.99 | 0.99 | 0.99 | 1.01 | 1.00 |
| Ti4+ | 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 |
| Al3+ | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 |
| Cr3+ | 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+ | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 |
| Fe2+ | 0.21 | 0.21 | 0.21 | 0.21 | 0.22 | 0.21 | 0.19 | 0.21 | 0.20 | 0.19 | 0.20 | 0.20 | 0.23 | 0.20 | 0.22 | 0.21 |
| Mn2+ | 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 | 0.00 | 0.00 |
| Mg2+ | 1.78 | 1.78 | 1.78 | 1.77 | 1.75 | 1.77 | 1.79 | 1.77 | 1.80 | 1.79 | 1.78 | 1.78 | 1.75 | 1.79 | 1.75 | 1.75 |
| Ca2+ | 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 | 0.01 | 0.01 | 0.01 |
| Total | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2.99 | 3.00 | 3 | 3 | 3.00 | 2.99 |
| Mg# | 89 | 89 | 89 | 90 | 89 | 90 | 90 | 90 | 90 | 91 | 90 | 90 | 88 | 90 | 89 | 89 |
| Fo | 88.54 | 89.34 | 89.09 | 89.32 | 88.56 | 89.32 | 89.33 | 89.08 | 88.84 | 89.94 | 89.36 | 88.72 | 87.80 | 89.23 | 88.16 | 88.32 |
| Fa | 11.32 | 10.53 | 10.69 | 10.38 | 11.20 | 10.48 | 10.18 | 10.45 | 10.49 | 9.42 | 10.05 | 10.69 | 11.46 | 10.01 | 11.26 | 11.17 |

**Table S2**. Representative pyroxene analyses of peridotite from the Suru-Thasgam ophiolitic slice, western Ladakh

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Orthopyroxene | | | | | Clinopyroxene | | | | | | | | |
| Samples | DP3 | | DP4 | DP5 | | DP3 | | DP4 | | | DP5 | | | |
| Points | P-26 | P-27 | P-28 | P-29 | P-30 | P-12 | P-16 | P-31 | P-32 | P-33 | P-35 | P-46 | P-49 | P-50 |
| SiO2 | 55.03 | 53.94 | 54.81 | 54.70 | 54.61 | 50.96 | 51.49 | 52.91 | 52.13 | 51.27 | 52.49 | 51.50 | 52.50 | 52.56 |
| TiO2 | 0.09 | 0.13 | 0.09 | 0.09 | 0.13 | 0.46 | 0.49 | 0.20 | 0.10 | 0.19 | 0.20 | 0.13 | 0.18 | 0.19 |
| Al2O3 | 4.89 | 5.22 | 5.11 | 4.87 | 5.45 | 6.75 | 6.42 | 1.84 | 2.50 | 2.26 | 2.12 | 1.65 | 2.36 | 2.05 |
| Cr2O3 | 0.55 | 0.52 | 0.55 | 0.56 | 0.57 | 0.89 | 1.00 | 0.41 | 0.38 | 0.42 | 0.37 | 0.34 | 0.45 | 0.40 |
| Fe2O3 | 0.00 | 1.48 | 0.00 | 0.00 | 0.00 | 1.91 | 0.95 | 0.86 | 1.95 | 6.06 | 2.68 | 4.76 | 1.84 | 1.31 |
| FeO | 6.13 | 5.25 | 6.48 | 6.64 | 6.00 | 0.86 | 1.84 | 2.20 | 1.18 | 2.41 | 0.70 | -1.04 | 1.29 | 2.30 |
| MnO | 0.14 | 0.20 | 0.19 | 0.04 | 0.11 | 0.18 | 0.15 | 0.13 | 0.00 | 0.14 | 0.16 | 0.18 | 0.13 | 0.23 |
| MgO | 31.73 | 32.62 | 31.78 | 31.39 | 32.14 | 14.98 | 15.16 | 17.57 | 17.00 | 18.36 | 18.10 | 17.48 | 17.10 | 17.37 |
| CaO | 0.90 | 0.64 | 0.77 | 1.36 | 0.71 | 21.86 | 21.20 | 23.26 | 24.15 | 24.20 | 23.27 | 24.50 | 24.23 | 23.03 |
| Total | 99.6 | 100 | 99.8 | 99.8 | 99.8 | 100 | 99.9 | 99.38 | 99.39 | 100.50 | 100.09 | 99.51 | 100.06 | 99.45 |
| Cations | *Based on 6 oxygen* | | | | | | | | | | | | | |
| Si4+ | 1.91 | 1.87 | 1.90 | 1.90 | 1.89 | 1.85 | 1.87 | 1.94 | 1.91 | 1.86 | 1.91 | 1.89 | 1.91 | 1.93 |
| Ti4+ | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 |
| Al4+ | 0.20 | 0.21 | 0.21 | 0.20 | 0.22 | 0.29 | 0.27 | 0.08 | 0.11 | 0.10 | 0.09 | 0.07 | 0.10 | 0.09 |
| Cr3+ | 0.02 | 0.01 | 0.02 | 0.02 | 0.02 | 0.03 | 0.03 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Fe3+ | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.05 | 0.03 | 0.02 | 0.05 | 0.17 | 0.07 | 0.13 | 0.05 | 0.04 |
| Fe2+ | 0.18 | 0.15 | 0.19 | 0.19 | 0.17 | 0.03 | 0.06 | 0.07 | 0.04 | 0.07 | 0.02 | 0.03 | 0.04 | 0.07 |
| Mn2+ | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 |
| Mg2+ | 1.65 | 1.68 | 1.64 | 1.63 | 1.66 | 0.81 | 0.82 | 0.96 | 0.93 | 0.99 | 0.98 | 0.96 | 0.93 | 0.95 |
| Ca2+ | 0.03 | 0.02 | 0.03 | 0 | 0.03 | 0.85 | 0.82 | 0.91 | 0.95 | 0.94 | 0.91 | 0.96 | 0.95 | 0.90 |
| Total | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Mg# | 90.2 | 91.7 | 89.7 | 89.5 | 90.5 | 96.89 | 93.64 | 93.43 | 96.26 | 93.15 | 97.88 | 96.78 | 95.95 | 93.08 |
| Wo | 1.82 | 1.26 | 1.54 | 2.71 | 1.41 | 48.90 | 47.76 | 46.49 | 48.20 | 46.42 | 45.73 | 47.70 | 48.15 | 46.13 |
| En | 88.59 | 88.71 | 88.36 | 86.96 | 89.24 | 46.61 | 47.52 | 48.87 | 47.23 | 49.01 | 49.50 | 47.36 | 47.28 | 48.42 |
| Fs | 9.59 | 10.04 | 10.10 | 10.33 | 9.35 | 4.50 | 4.73 | 4.65 | 4.56 | 4.57 | 4.77 | 4.94 | 4.57 | 5.45 |

**Table S3**. Representative clinopyroxene analyses of pyroxenite from the Suru-Thasgam ophiolitic slice, western Ladakh

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | TG12 | | | TG13 | | | TG14 | | | TG15 | | | TG11 | |
| Points | P-41 | P-43 | P-44 | P-81 | P-83 | P-112 | P-10 | P-12 | P-13 | P-25 | P-31 | P-40 | P-71 | P-40 |
| SiO2 | 53.96 | 54.20 | 54.06 | 54.35 | 54.25 | 54.03 | 53.93 | 54.59 | 54.37 | 53.59 | 53.95 | 54.10 | 50.55 | 55.01 |
| TiO2 | 0.06 | 0.08 | 0.10 | 0.03 | 0.06 | 0.07 | 0.06 | 0.06 | 0.04 | 0.06 | 0.12 | 0.09 | 0.15 | 0.05 |
| Al2O3 | 1.70 | 1.10 | 1.54 | 0.48 | 0.83 | 1.03 | 0.46 | 0.59 | 0.39 | 1.06 | 1.18 | 0.83 | 2.26 | 0.54 |
| Fe2O3 | 0.00 | 0.53 | 0.00 | 0.16 | 0.63 | 0.00 | 1.07 | 0.13 | 0.83 | 1.36 | 1.24 | 1.36 | 4.39 | 0.22 |
| Cr2O3 | 0.42 | 0.29 | 0.47 | 0.33 | 0.54 | 0.47 | 0.20 | 0.14 | 0.08 | 0.33 | 0.28 | 0.28 | 0.10 | 0.03 |
| FeO | 2.35 | 2.03 | 2.28 | 1.73 | 2.16 | 2.10 | 0.96 | 1.88 | 0.85 | 1.76 | 1.81 | 1.37 | 2.91 | 1.87 |
| MnO | 0.06 | 0.15 | 0.02 | 0.06 | 0.03 | 0.00 | 0.23 | 0.10 | 0.07 | 0.09 | 0.05 | 0.07 | 0.04 | 0.11 |
| MgO | 17.18 | 17.86 | 17.68 | 17.89 | 19.03 | 17.24 | 17.62 | 17.58 | 17.73 | 17.38 | 17.59 | 17.55 | 15.30 | 17.72 |
| CaO | 23.82 | 23.48 | 22.92 | 24.07 | 22.01 | 23.43 | 24.68 | 24.69 | 25.16 | 23.76 | 23.78 | 24.56 | 22.63 | 25.00 |
| Na2O | 0.14 | 0.17 | 0.17 | 0.11 | 0.13 | 0.14 | 0.07 | 0.08 | 0.06 | 0.19 | 0.20 | 0.13 | 0.29 | 0.05 |
| Total | 99.70 | 99.88 | 99.24 | 99.22 | 99.67 | 98.51 | 99.28 | 99.85 | 99.57 | 99.57 | 100.21 | 100.32 | 98.64 | 100.59 |
| Cations | *Based on 6 Oxygen* | | | | | | | | | | | | | |
| Si4+ | 1.97 | 1.98 | 1.97 | 1.99 | 1.98 | 1.99 | 1.99 | 1.99 | 1.99 | 1.98 | 1.97 | 1.98 | 1.95 | 1.99 |
| Ti4+ | 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 |
| Al3+ | 0.07 | 0.05 | 0.07 | 0.02 | 0.04 | 0.04 | 0.02 | 0.03 | 0.02 | 0.05 | 0.05 | 0.04 | 0.10 | 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 |
| Cr3+ | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 |
| Fe2+ | 0.07 | 0.06 | 0.07 | 0.05 | 0.07 | 0.06 | 0.03 | 0.06 | 0.03 | 0.05 | 0.06 | 0.04 | 0.09 | 0.06 |
| Mn2+ | 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 |
| Mg2+ | 0.93 | 0.97 | 0.96 | 0.98 | 1.03 | 0.95 | 0.97 | 0.95 | 0.97 | 0.96 | 0.96 | 0.96 | 0.88 | 0.95 |
| Ca2+ | 0.93 | 0.92 | 0.90 | 0.94 | 0.86 | 0.93 | 0.97 | 0.96 | 0.99 | 0.94 | 0.93 | 0.96 | 0.94 | 0.97 |
| Na2+ | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.02 | 0.00 |
| Total | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Mg# | 93 | 94 | 93 | 95 | 94 | 94 | 97 | 94 | 97 | 95 | 95 | 96 | 90 | 94 |
| Wo | 48.06 | 47.04 | 46.50 | 47.84 | 43.87 | 47.76 | 49.42 | 48.77 | 49.83 | 48.18 | 47.88 | 49.07 | 48.99 | 48.91 |
| En | 48.24 | 49.79 | 49.90 | 49.48 | 52.77 | 48.90 | 49.08 | 48.33 | 48.87 | 49.04 | 49.28 | 48.79 | 46.09 | 48.23 |
| Fs | 3.70 | 3.17 | 3.61 | 2.68 | 3.37 | 3.33 | 1.49 | 2.90 | 1.30 | 2.78 | 2.85 | 2.14 | 4.92 | 2.86 |
| Jadeite | 1.04 | 1.30 | 1.33 | 0.79 | 1.06 | 1.07 | 0.50 | 0.58 | 0.44 | 1.39 | 1.52 | 0.92 | 2.28 | 0.33 |
| Diopside | 98.96 | 98.70 | 98.67 | 99.21 | 98.94 | 98.93 | 99.49 | 99.42 | 99.56 | 98.60 | 98.47 | 99.07 | 97.72 | 99.66 |

**Table S4**. Representative spinel analyses of pyroxenite and peridotite from the Suru-Thasgam ophiolitic slice, western Ladakh

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Pyroxenites | | | | | | | Peridotites | | | | | |
| Samples | TG12 | TG13 | | TG14 | | TG15 | TG11 | DP3 | | | DP5 | | |
| Points | P-95 | P-122 | P-120 | P-26 | P-27 | P-29 | P-35 | P-21 | P-49 | P-19 | P-55 | P-20 | P-51 |
| SiO2 | 0.06 | 0.17 | 0.17 | 0.16 | 0.13 | 0.17 | 0.20 | 0.38 | 0.08 | 0.13 | 0.82 | 0.12 | 0.68 |
| TiO2 | 0.49 | 0.55 | 0.47 | 0.46 | 0.41 | 0.36 | 0.40 | 0.37 | 1.18 | 0.80 | 0.29 | 0.47 | 0.43 |
| Al2O3 | 13.17 | 10.90 | 14.24 | 11.40 | 8.09 | 7.38 | 8.61 | 3.54 | 0.23 | 0.24 | 0.57 | 0.10 | 0.23 |
| Cr2O3 | 41.51 | 40.71 | 40.08 | 46.31 | 49.73 | 47.53 | 52.24 | 21.21 | 21.23 | 16.43 | 10.17 | 11.13 | 9.66 |
| Fe2O3 | 12.14 | 15.94 | 13.09 | 10.23 | 11.36 | 13.95 | 7.66 | 42.79 | 45.41 | 50.65 | 59.04 | 57.35 | 57.08 |
| FeO | 26.37 | 24.70 | 23.28 | 24.60 | 22.33 | 24.18 | 24.11 | 27.66 | 28.16 | 28.91 | 25.98 | 29.14 | 29.63 |
| MnO | 0.53 | 0.32 | 0.36 | 0.76 | 0.66 | 0.71 | 0.81 | 1.80 | 2.17 | 1.54 | 1.08 | 0.89 | 0.89 |
| MgO | 5.18 | 6.37 | 8.08 | 5.64 | 6.78 | 5.48 | 5.84 | 1.89 | 0.78 | 0.84 | 1.48 | 0.60 | 0.64 |
| CaO | 0.21 | 0.09 | 0.07 | 0.24 | 0.23 | 0.26 | 0.23 | 0.03 | 0.19 | 0.02 | 0.01 | 0.16 | 0.15 |
| Total | 99.66 | 99.74 | 99.85 | 99.80 | 99.71 | 100.01 | 100.09 | 99.67 | 99.44 | 99.54 | 99.43 | 99.95 | 99.39 |
| Cations | *Based on 32 Oxygen* | | | | | | | | | | | | |
| Si4+ | 0.02 | 0.05 | 0.05 | 0.04 | 0.04 | 0.05 | 0.05 | 0.11 | 0.03 | 0.04 | 3.08 | 0.04 | 0.21 |
| Ti4+ | 0.10 | 0.11 | 0.10 | 0.09 | 0.09 | 0.07 | 0.08 | 0.08 | 0.27 | 0.18 | 0.06 | 0.11 | 0.10 |
| Al3+ | 4.26 | 3.53 | 4.52 | 3.66 | 2.62 | 2.42 | 2.77 | 1.24 | 0.08 | 0.09 | 0.18 | 0.04 | 0.09 |
| Cr3+ | 9.00 | 8.85 | 8.54 | 9.97 | 10.79 | 10.43 | 11.38 | 5.00 | 4.72 | 3.75 | 2.09 | 2.24 | 1.89 |
| Fe3+ | 2.50 | 3.30 | 2.65 | 2.10 | 2.35 | 2.91 | 1.57 | 9.37 | 10.60 | 11.72 | 13.46 | 13.43 | 13.40 |
| Fe2+ | 5.82 | 5.45 | 4.79 | 5.60 | 5.13 | 5.61 | 5.50 | 6.89 | 7.31 | 7.43 | 5.66 | 7.58 | 7.73 |
| Mn2+ | 0.12 | 0.07 | 0.08 | 0.18 | 0.15 | 0.17 | 0.19 | 0.45 | 0.57 | 0.40 | 0.24 | 0.23 | 0.23 |
| Mg2+ | 2.12 | 2.61 | 3.25 | 2.29 | 2.77 | 2.27 | 2.38 | 0.84 | 0.36 | 0.38 | 0.24 | 0.28 | 0.30 |
| Ca2+ | 0.06 | 0.03 | 0.02 | 0.07 | 0.07 | 0.08 | 0.07 | 0.01 | 0.06 | 0.01 | 0.00 | 0.05 | 0.05 |
| Total | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| Cr3+# | 57.10 | 56.44 | 54.33 | 63.40 | 68.49 | 66.19 | 72.38 | 32.01 | 30.62 | 24.11 | 21.53 | 14.29 | 12.29 |
| Al3+# | 27.01 | 22.53 | 28.78 | 23.27 | 16.61 | 15.33 | 17.61 | 7.97 | 0.55 | 0.56 | 1.80 | 0.23 | 0.56 |
| Mg2+# | 26.67 | 32.38 | 40.38 | 29.01 | 35.11 | 28.76 | 30.16 | 10.88 | 4.72 | 4.92 | 48.05 | 3.54 | 3.72 |
| Fe2+# | 73.33 | 67.62 | 59.62 | 70.99 | 64.89 | 71.24 | 69.84 | 89.12 | 95.28 | 95.08 | 51.95 | 96.46 | 96.28 |

Cr3+# = cationic ratio of [Cr3+/(Cr3+ + Al3+)] × 100; Al3+# = cationic ratio of [Al3+/(Cr3+ + Al3+ + Fe3+)] × 100; Fe3+# = cationic ratio of [Fe3+/(Fe3+ + Cr3+ + Al3+)] × 100; Mg2+# = cationic ratio of [Mg2+/(Mg2+ + Fe2+)] × 100; Fe2+# = cationic ratio of [Fe2+/(Fe2+ + Mg2+)] × 100;

F melt = 10 × 1n(Cr#) + 24, where “F” is melting degree (in percent) and Cr# = cationic ratio of Cr3+/(Cr3+ + Al3+).

**Table S5**. Representative plagioclase analyses of gabbro from the Suru-Thasgam ophiolitic slice, western Ladakh

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Samples | SM2 | | SM4 | | SM6 | | SM11 | | SM13 | | SM14 | SM15 |
| Point | P-6 | P-7 | P-8 | P-9 | P-10 | P-21 | P-23 | P-24 | P-26 | P-27 | P-29 | P-30 |
| SiO2 | 54.67 | 57.18 | 55.14 | 57.62 | 57.43 | 58.07 | 58.44 | 49.95 | 50.81 | 52.07 | 51.92 | 55.30 |
| TiO2 | 0.03 | 0.01 | 0.00 | 0.04 | 0.02 | 0.01 | 0.03 | 0.01 | 0.02 | 0.03 | 0.01 | 0.01 |
| Al2O3 | 25.49 | 24.96 | 24.72 | 25.51 | 25.65 | 25.85 | 24.48 | 30.29 | 30.89 | 29.15 | 30.23 | 27.10 |
| 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 |
| Fe2O3 | 0.56 | 0.18 | 0.04 | 0.10 | 0.25 | 0.22 | 0.10 | 0.42 | 0.50 | 0.44 | 0.18 | 0.57 |
| FeO | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| MnO | 0.08 | 0.08 | 0.14 | 0.04 | 0.07 | 0.08 | 0.12 | 0.00 | 0.01 | 0.12 | 0.17 | 0.09 |
| MgO | 0.13 | 0.01 | 0.19 | 0.18 | 0.00 | 0.18 | 0.21 | 0.13 | 0.21 | 0.04 | 0.01 | 0.13 |
| CaO | 11.56 | 8.93 | 11.55 | 8.07 | 8.45 | 7.88 | 7.28 | 13.36 | 12.91 | 13.47 | 12.96 | 12.64 |
| Na2O | 6.70 | 7.71 | 7.66 | 7.82 | 7.34 | 7.55 | 8.58 | 5.08 | 3.43 | 4.65 | 4.49 | 4.85 |
| K2O | 0.02 | 0.07 | 0.12 | 0.15 | 0.10 | 0.06 | 0.06 | 0.05 | 0.41 | 0.04 | 0.02 | 0.04 |
| Total | 99.24 | 99.14 | 99.58 | 99.52 | 99.32 | 99.90 | 99.28 | 99.28 | 99.19 | 100.01 | 99.99 | 100.75 |
| Cations | *Based on 8 Oxygen* | | | | | | | | | | | |
| Si4+ | 2.47 | 2.59 | 2.44 | 2.55 | 2.56 | 2.59 | 2.60 | 2.30 | 2.31 | 2.36 | 2.33 | 2.47 |
| Ti4+ | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Al4+ | 1.36 | 1.33 | 1.31 | 1.35 | 1.37 | 1.36 | 1.28 | 1.65 | 1.69 | 1.56 | 1.63 | 1.43 |
| Cr3+ | 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+ | 0.02 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.02 | 0.02 | 0.02 | 0.01 | 0.02 |
| 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 |
| Mn2+ | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 |
| Mg2+ | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 |
| Ca2+ | 0.56 | 0.39 | 0.56 | 0.39 | 0.41 | 0.38 | 0.35 | 0.66 | 0.64 | 0.65 | 0.63 | 0.65 |
| Na2+ | 0.59 | 0.68 | 0.67 | 0.68 | 0.64 | 0.65 | 0.74 | 0.36 | 0.31 | 0.41 | 0.40 | 0.42 |
| K2+ | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 |
| Total | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| An | 48.76 | 36.10 | 45.18 | 36.04 | 38.70 | 36.44 | 31.82 | 64.25 | 65.82 | 61.43 | 61.38 | 60.74 |
| Ab | 51.13 | 63.50 | 54.25 | 63.16 | 60.78 | 63.25 | 67.86 | 35.49 | 31.68 | 38.33 | 38.50 | 39.04 |
| Or | 0.11 | 0.40 | 0.57 | 0.80 | 0.52 | 0.31 | 0.32 | 0.26 | 2.50 | 0.24 | 0.12 | 0.22 |

**Table S6**. Representative amphibole analyses of gabbro from the Suru-Thasgam ophiolitic slice, western Ladakh

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Samples | SM2 | | SM4 | | SM6 | | SM11 | | SM13 | SM14 | |
| Point | P-11 | P-12 | P-15 | P-16 | P-42 | P-46 | P-50 | P-58 | P-63 | P-67 | P-68 |
| SiO2 | 51.78 | 52.06 | 52.60 | 50.89 | 49.05 | 42.99 | 48.54 | 45.75 | 48.10 | 48.04 | 48.43 |
| TiO2 | 0.43 | 0.35 | 0.28 | 0.31 | 0.13 | 0.35 | 0.41 | 0.61 | 0.56 | 0.53 | 0.59 |
| Al2O3 | 3.84 | 2.77 | 2.69 | 3.34 | 4.47 | 11.99 | 4.17 | 11.88 | 7.51 | 7.73 | 7.36 |
| FeO | 10.33 | 10.31 | 12.47 | 11.88 | 14.05 | 16.65 | 12.74 | 12.54 | 12.05 | 12.73 | 12.21 |
| MnO | 0.01 | 0.11 | 0.35 | 0.40 | 0.40 | 0.40 | 0.33 | 0.38 | 0.15 | 0.37 | 0.16 |
| MgO | 16.88 | 17.02 | 16.47 | 16.84 | 14.30 | 14.85 | 14.18 | 14.15 | 15.07 | 15.17 | 15.18 |
| CaO | 12.65 | 12.67 | 10.73 | 10.83 | 12.98 | 7.46 | 14.98 | 9.64 | 11.06 | 10.33 | 11.01 |
| Na2O | 0.42 | 0.29 | 0.40 | 0.36 | 0.22 | 0.31 | 0.32 | 0.82 | 1.00 | 1.02 | 0.89 |
| K2O | 0.03 | 0.07 | 0.03 | 0.10 | 0.04 | 0.09 | 0.07 | 0.16 | 0.08 | 0.10 | 0.09 |
| Total | 96.37 | 95.66 | 96.04 | 94.95 | 95.64 | 95.10 | 95.75 | 95.94 | 95.59 | 96.01 | 95.91 |
| Cations *Based on 23 Oxygen* | | | | | | | | | | | |
| Si4+ | 7.50 | 7.60 | 7.68 | 7.52 | 7.34 | 6.49 | 7.27 | 6.39 | 7.10 | 7.07 | 7.12 |
| Ti4+ | 0.05 | 0.04 | 0.03 | 0.03 | 0.01 | 0.04 | 0.05 | 0.14 | 0.06 | 0.06 | 0.06 |
| Al4+ | 0.66 | 0.48 | 0.46 | 0.58 | 0.79 | 2.13 | 0.74 | 2.36 | 1.31 | 1.34 | 1.27 |
| Fe2+ | 1.25 | 1.26 | 1.52 | 1.47 | 1.76 | 2.10 | 1.60 | 1.18 | 1.49 | 1.57 | 1.50 |
| Mn2+ | 0.00 | 0.01 | 0.04 | 0.05 | 0.05 | 0.05 | 0.04 | 0.00 | 0.02 | 0.05 | 0.02 |
| Mg2+ | 3.64 | 3.71 | 3.58 | 3.71 | 3.19 | 3.34 | 3.17 | 3.18 | 3.32 | 3.33 | 3.33 |
| Ca2+ | 1.96 | 1.98 | 1.68 | 1.72 | 2.08 | 1.21 | 2.40 | 1.61 | 1.75 | 1.63 | 1.73 |
| Na2+ | 0.12 | 0.08 | 0.11 | 0.10 | 0.06 | 0.09 | 0.09 | 0.71 | 0.29 | 0.29 | 0.25 |
| K2+ | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 | 0.02 | 0.01 | 0.12 | 0.02 | 0.02 | 0.02 |
| Total | 17.19 | 17.17 | 17.12 | 17.21 | 17.29 | 17.46 | 17.37 | 17.70 | 17.34 | 17.35 | 17.31 |
| Mg# | 74 | 75 | 70 | 72 | 80 | 64 | 61 | 66 | 73 | 69 | 68 |

**Supplementary Figure Captions:**

**Figure S1.** (Colour online) Plots of (a) Nb/Y versus SiO2 (after Winchester and Floyd, 1977) and (b) AFM plot (after Irvine and Baragar, 1971) for the mafic-ultramafic rocks of Suru-Thasgam ophiolitic slice, western Ladakh.

**Figure S2.** (Colour online) Selected major and trace elements against magnesium number (Mg#) in mafic-ultramafic rocks of Suru-Thasgam ophiolitic slice, western Ladakh.

**Figure S3.** (Colour online) Selected trace elements against loss on ignition (LOI) in mafic-ultramafic rock types of Suru-Thasgam ophiolitic slice, western Ladakh.

**Figure S4.** (Colour online) Al2O3/SiO2 versus MgO/SiO2 mantle array plot (on anhydrous basis) for Suru-Thasgam peridotites in comparison to Shergol peridotites (after Bhat et al., 2017a) and Suru Valley peridotites (after Bhat et al., 2019b). The thick orange field identical to the terrestrial mantle array is from Jagoutz et al. (1979) and Hart and Zindler (1986).

**Figure S5.** (Colour online) Incompatible element versus incompatible element binary plots of; (a) Sm versus Gd and (b) Nd versus Sm for the studied gabbros from Suru-Thasgam ophiolitic slice in comparison to other ophiolite mafic rock types from western Ladakh.