Table S2. Parameters used in the melting models

|  |  |  |
| --- | --- | --- |
| Mantle source | Mode | Melt mode |
| **Garnet-Spinel lherzolite** |  |  |
| Olivine  | 0.55 | -0.10 |
| Orthopyroxene  | 0.22 | 0.25 |
| Clinopyroxene  | 0.15 | 0.61 |
| Spinel  | 0.02 | 0.04 |
| Garnet  | 0.06 | 0.20 |
| **Spinel lherzolite** |  |  |
| Olivine  | 0.53 | -0.30 |
| Orthopyroxene  | 0.24 | 0.40 |
| Clinopyroxene  | 0.20 | 0.82 |
| Spinel  | 0.03 | 0.08 |
| **0.1% ilmenite-bearing spinel lherzolite** |
| Olivine  | 0.529 | -0.30 |
| Orthopyroxene  | 0.24 | 0.40 |
| Clinopyroxene  | 0.20 | 0.81 |
| Spinel  | 0.03 | 0.08 |
| Ilmenite | 0.001 | 0.01 |
| **1% ilmenite-bearing spinel lherzolite** |
| Olivine  | 0.52 | -0.30 |
| Orthopyroxene  | 0.24 | 0.40 |
| Clinopyroxene  | 0.20 | 0.72 |
| Spinel  | 0.03 | 0.08 |
| Ilmenite | 0.01 | 0.1 |
| **0% rutile-bearing spinel lherzolite** |
| Olivine  | 0.53 | -0.30 |
| Orthopyroxene  | 0.24 | 0.40 |
| Clinopyroxene  | 0.20 | 0.80 |
| Spinel  | 0.03 | 0.08 |
| Rutile | 0.00 | 0.00 |
| **0.2% rutile-bearing spinel lherzolite** |
| Olivine  | 0.528 | -0.30 |
| Orthopyroxene  | 0.24 | 0.40 |
| Clinopyroxene  | 0.20 | 0.80 |
| Spinel  | 0.03 | 0.08 |
| Rutile | 0.002 | 0.02 |
| **0.3% rutile-bearing spinel lherzolite** |
| Olivine  | 0.527 | -0.30 |
| Orthopyroxene  | 0.24 | 0.40 |
| Clinopyroxene  | 0.20 | 0.79 |
| Spinel  | 0.03 | 0.08 |
| Rutile | 0.003 | 0.03 |
| **0.4% rutile-bearing spinel lherzolite** |
| Olivine  | 0.506 | -0.30 |
| Orthopyroxene  | 0.24 | 0.40 |
| Clinopyroxene  | 0.22 | 0.78 |
| Spinel  | 0.03 | 0.08 |
| Rutile | 0.004 | 0.04 |
| **5% amphibole-bearing spinel lherzolite** |
| Olivine  | 0.50 | -0.30 |
| Orthopyroxene  | 0.22 | 0.40 |
| Clinopyroxene  | 0.20 | 0.62 |
| Spinel  | 0.03 | 0.08 |
| Amphibole | 0.05 | 0.20 |
| **15% amphibole-bearing spinel lherzolite** |
| Olivine  | 0.40 | -0.30 |
| Orthopyroxene  | 0.22 | 0.40 |
| Clinopyroxene  | 0.20 | 0.62 |
| Spinel  | 0.03 | 0.08 |
| Amphibole | 0.15 | 0.20 |
| **0.3% rutile + 5% amphibole-bearing spinel lherzolite** |
| Olivine  | 0.48 | -0.32 |
| Orthopyroxene  | 0.24 | 0.40 |
| Clinopyroxene  | 0.20 | 0.62 |
| Spinel  | 0.03 | 0.08 |
| Rutile | 0.003 | 0.03 |
| Amphibole | 0.05 | 0.19 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Element | La | Nd | Sm | Yb | Nb | Ta |
| DOl | 0.0004 | 0.0003 | 0.0011 | 0.0100 | 0.0100 | 0.0100 |
| DOpx | 0.0005 | 0.0068 | 0.0100 | 0.0490 | 0.0013 | 0.0025 |
| DCpx | 0.0320 | 0.1290 | 0.2810 | 0.4000 | 0.0077 | 0.0110 |
| DSpl | 0.0100 | 0.0100 | 0.0100 | 0.0100 | 0.0200 | 0.0200 |
| DGrt | 0.0100 | 0.0520 | 0.2170 | 6.6000 | 0.0538 | 0.0510 |
| Damp | 0.1700 | 0.4400 | 0.7600 | 0.5900 | 0.2600 | 0.3800 |
| Drut | 0.0031 | 0.2770 | 0.0007 | 0.0093 | 29.8 | 44.0 |
| Dilm | 0.098 |  |  | 0.17 | 2.3 | 2.7 |

Garnet–Spinel and Spinel lherzolite models are revised from Gurenko and Chaussidon (1995).

Partitioning coefficients are compiled from GERM Partition Coefficient Database.