**Table S5.**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Phase** | **ρ**  *kg/m3* | **Viscosity Creep law** | **B(1)**  *(Pa·s)-1/(Pan·s)-1* | **n** | **Ea**  *J/mol* | **Va**  *m3/mol* | **α**  *K-1* | **k**  *W/m/K* | **Cp**  *J/kg/K* |
| **Lithosphere(2)** | 3300 |  |  |  |  |  |  |  |  |
| **Upper mantle** | 3300 | **Diffusion Creep :** *Dry Diffusion Olivine(a)*  **Dislocation Creep :** *Dry Dislocation Olivine(a)* | 1.5·10-9  6.22·10-16 | -  3.5 | 375·103  530·103 | 8·10-6  15·10-6 | 3·10-5 | 3 | 1050 |
| **Lower mantle** | 3600 |
| **Upper M. Plume** | 3300 |
| **Lower M. Plume** | 3600 |
| **Mantle Zircon(3)** | - |
| **Plume Zircon(3)** | - |
| **Oceanic Crust** | 3000 | **Diffusion Creep :** *Wet Plagioclase (b)*  **Dislocation Creep:** *Wet Plagioclase (b)* | 4.74·10-11  1.13·10-15 | -  3.0 | 159·103  345·103 | 38·10-6  38·10-6 |