

Figure S1 BSE images of the measured typical olivine-spinel pairs from the JGD basalts. Ol, olivine; Sp, spinel. The zonation is clear for these olivine phenocrysts.

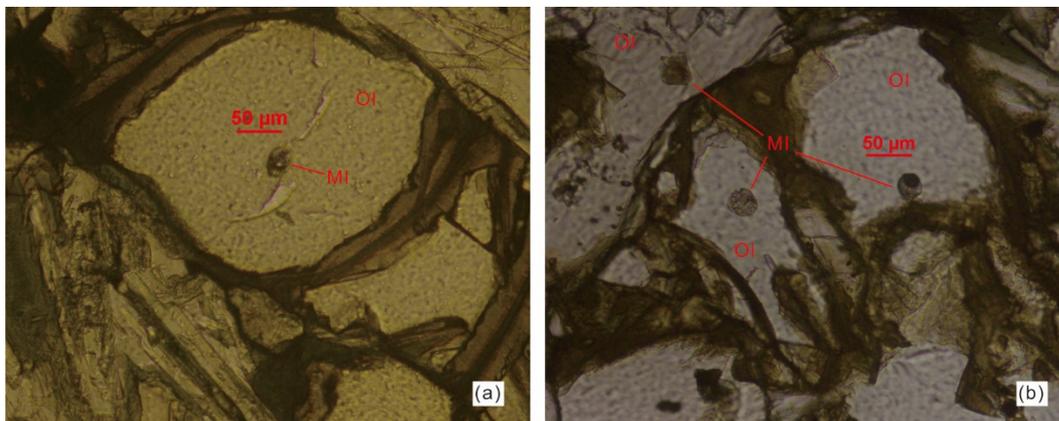


Figure S2 Typical melt inclusions in olivine crystals in thin-section of the JGD basalts. Note that these melt inclusions have occurred devitrification.

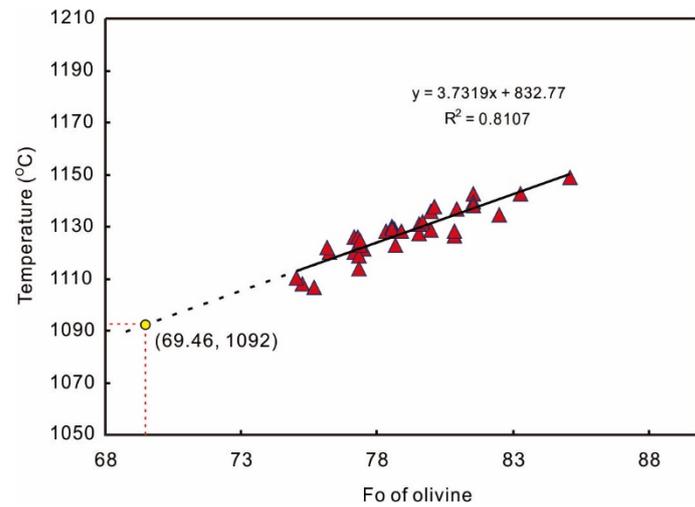


Figure S3 Olivine crystallization temperature calculated by Al-in-olivine thermometer versus Fo content of olivine phenocrysts. The yellow closed circle represents the extrapolated temperature (1092 °C) for the averaged rim compositions (Fo = 69.46) of the JGD olivine based on the regressed relationship of crystallization temperature vs Fo of olivine.

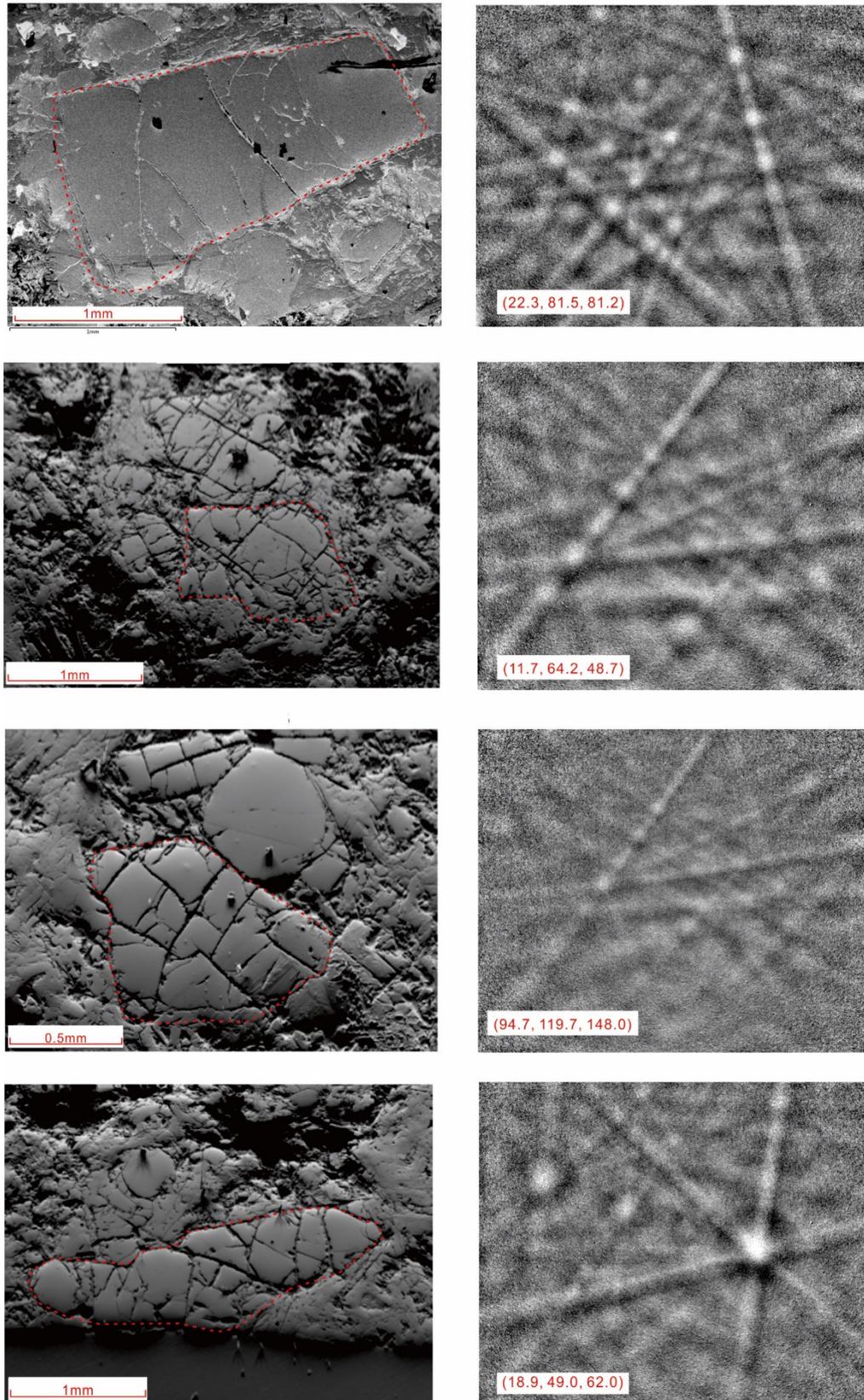


Figure S4 EBSD images for the measured typical olivines.

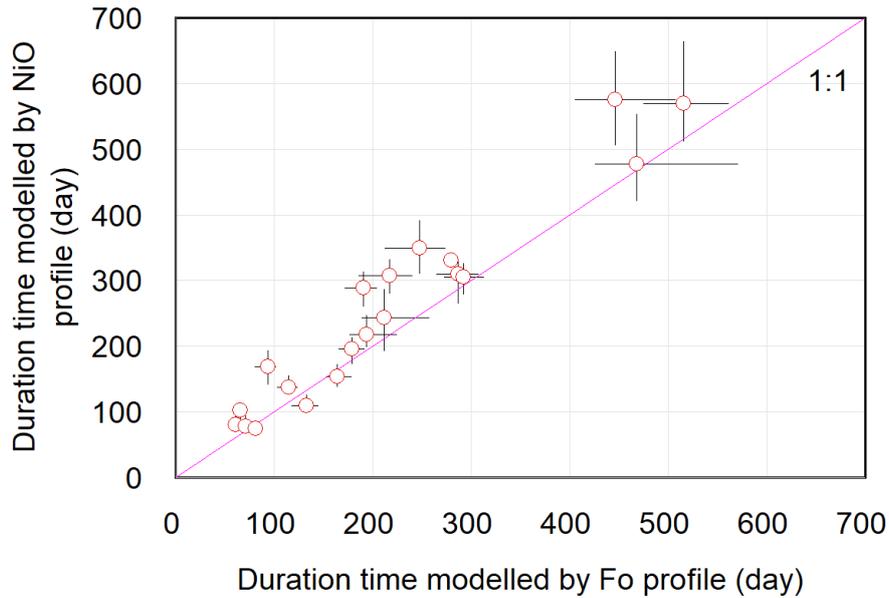


Figure S5 Diffusion timescales modelled by NiO profiles vs the diffusion timescales modelled by Fo profiles. The timescales modelled by NiO profiles are generally larger than that modelled by Fo profiles.

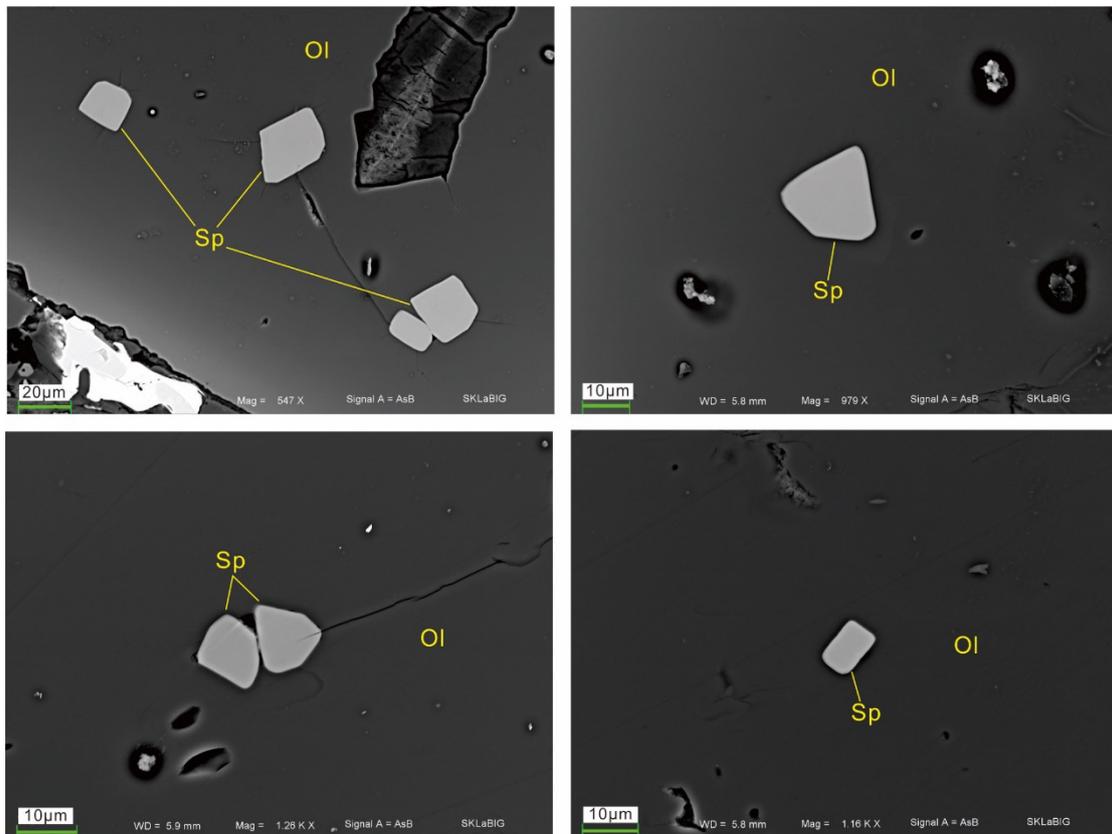


Figure S6 Close BSE images of olivine-hosted spinels from the JGD basalts. The lacking of zonation indicates each of the spinel has homogeneous composition from core to rim. Ol, olivine; Sp, spinel.