
Supplemental Material

**Table S1.** Composition of the olivines from late Cenozoic basalts in and surrounding the South China Sea.

**Table S2.** The collected Nd-Hf-Pb isotope composition of the late Cenozoic basalts in and around the South China Sea.

**Table S3.** The measured composition of the Mong Ol Sh11-2 olivine.

**Table S4.** The composition and calculated temperature for the olivine-spinel pairs from the MORBs of U1433B.