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Supplemental Material

Text. Analytical Methods.

Table S1. Major and trace element compositions for blocks from the ophiolitic mélanges in the western Ganqimaodu area.

Table S2. Zircon U-Pb isotopic data for samples in this study.

Table S3. Zircon Lu-Hf isotopic data for the early Paleozoic plutons in the Ganqimaodu area.

Analytical methods

1. Whole rock major and trace elements analysis

Whole-rock major element compositions were analyzed by X-ray fluorescence (XRF-1500) at the Institute of Geology and Geophysics, Chinese Academy of Sciences (IGGCAS), Beijing, China. Analytical precision is generally better than 1%. Whole-rock trace elements were analyzed using inductively coupled plasma-mass spectrometry (ICP-MS) at the ALS Chemex Co., Ltd, Guangzhou, China. The accuracy of analyses is better than 5%.

2. Zircon U-Pb dating

Zircon grains were picked out by magnetic and heavy liquid methods. They were hand-picked under a binocular microscope and mounted on adhesive tape, then enclosed in epoxy resin and polished about 1/2 of their thickness. Cathodoluminescence (CL) imaging for zircon grain was operated with a scanning electron microscope to reveal their internal texture at the IGGCAS. Zircons from all samples were dated using an Agilent 7500a Quadrupole-ICP-MS with a GeoLasHD 193 nm ArF excimer laser ablation system at the IGGCAS. Each analysis spot has a 32 μm diameter and the density of energy of 4.0 J/cm^2 at 71.8 mJ output of energy. The zircon 91500 was used as external standard for age calculation. External standards for concentration calculation are NIST SRM 610 and ARM. The more details about the instrumental settings and analytical procedures can be found in Wu et al. (2007) and Xie et al. (2008). The GLITTER program (Macquarie University) was used to calculate isotopic concentrations and ratios. Common Pb was corrected by the method proposed by Andersen (2002). Concordant diagrams were made using ISOPLOT 3.0 (Ludwig, 2003). The plot of probability density and histogram were produced by DensityPlotter 7.2 (Vermeesch, 2012). In this paper, $^{206}Pb/^{238}U$ ages are reported for zircons younger than 1000 Ma, while $^{207}Pb/^{206}Pb$ ages are reported for zircons older than 1000 Ma.

3. Zircon Lu-Hf isotopic analysis

Zircon Lu-Hf isotope analysis was operated near the site where U-Pb analyses were performed, by a Resolution SE 193 laser-ablation system attached to a Thermo Fisher Scientific Neptune Plus MC-ICP-MS at Beijing ZKKY Technology Co., Ltd. All zircons have a beam diameter of 44 μm, a repetition of 10 Hz and the density of energy of 8 J/cm^2. Details

for instrumental conditions and data acquisition protocols can be found in Hou et al. (2007). Zircon GJ-1 with a weighted mean $^{176}Hf/^{177}Hf$ ratio of 0.282006 ± 21 was used as the reference standard. The initial $^{176}Hf/^{177}Hf$ ratios were calculated by measured $^{176}Lu/^{177}Hf$ ratios and the ^{176}Lu decay constant of 1.867×10^{-11} yr^{-1} (Söderlund et al., 2004). The present chondritic values of $^{176}Hf/^{177}Hf$ = 0.282772 and $^{176}Lu/^{177}Hf$ = 0.0332 proposed by Blichert-Toft and Albarède (1997) were used for the calculation of εHf(t) values. The current depleted mantle has ratios of $^{176}Hf/^{177}Hf$ = 0.28325 and $^{176}Lu/^{177}Hf$ = 0.0384 (Griffin et al., 2000). The ratios of $^{176}Lu/^{177}Hf$ = 0.015 for average continent was reported by Griffin et al. (2002).

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