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Figure S1. Variation diagrams between whole-rock ϵNd (t) and contamination sensitive indexes (SiO_2 , $\text{La}/\text{Sm}_{\text{cn}}$, Nb/Nb^*) for studied mafic samples.

ANALYTICAL METHODS

1.1. LA-ICP-MS zircon U-Pb analyses

Zircons were separated from samples following standard procedures of crushing and heavy mineral separation using a Wilfley table, Frantz isodynamic separator, and heavy liquids. Zircons were handpicked from the heavy fraction under a binocular microscope. Prior to the U-Pb dating and trace element analyses, cathodoluminescence (CL) images of zircons were carried out by a Gatan Mono CL4+ CL system at State Key Laboratory of Geological Process and Mineral Resources (GPMR), China University of Geosciences, Wuhan.

Uranium-Pb dating and trace element analyses of zircons were conducted synchronously by LA-ICP-MS at the Wuhan Sample Solution Analytical Technology Co., Ltd., Hubei Province, China (WSSATC). Detailed operating conditions for the laser ablation system and the ICP-MS instrument and data reduction are the same as description by Liu et al. (2010a; 2010b; 2008b). Laser sampling was performed using a GeoLas 2005. An Agilent 7500a ICP-MS instrument was used to acquire ion-signal intensities. Helium was applied as a carrier gas. Argon was used as the make-up gas and mixed with the carrier gas via a T-connector before entering the ICP. Nitrogen was added into the central gas flow ($\text{Ar}+\text{He}$) of the Ar plasma to decrease the detection limit and improve precision (Hu et al., 2008). Each analysis incorporated a background acquisition of ~20–30 s (gas blank) followed by 50 s data acquisition from the sample. The Agilent Chemstation was utilized for the acquisition of each individual analysis. Off-line selection and integration of background and analyte signals, and time-drift correction and

quantitative calibration for trace element analyses and U-Pb dating were performed by ICPMSDataCal (Liu et al., 2010a; Liu et al., 2008b).

Zircon 91500 was used as external standard for U-Pb dating, and was analyzed twice every 5 analyses. Time-dependent drifts of U-Th-Pb isotopic ratios were corrected using a linear interpolation (with time) for every five analyses according to the variations of 91500 (i.e., 2 zircon 91500 + 5 samples + 2 zircon 91500) (Liu et al., 2010a). Preferred U-Th-Pb isotopic ratios used for 91500 are from Wiedenbeck et al. (1995). Uncertainty of preferred values for the external standard 91500 was propagated to the ultimate results of the samples. Concordia diagrams and weighted mean calculations were made using Isoplot/Ex_ver3 (Ludwig, 2003). Trace element compositions of zircons were calibrated against multiple-reference materials (BCR-2G and BIR-1G) combined with internal standardization (Liu et al., 2010a).

1.2. Zircon Lu–Hf isotope analyses

In situ zircon Lu–Hf isotope measurements were carried out on a Neptune Plus MC-ICP-MS (Thermo Fisher Scientific, Germany), in combination with the GeoLas 2005 at the WSSATC. Detailed operating conditions for the laser ablation system and the MC-ICP-MS instrument and data calibrating and processing were described by Hu et al. (2012). The interference of ^{176}Lu on ^{176}Hf was corrected by measuring the intensity of the interference-free ^{175}Lu isotope, using the recommended $^{176}\text{Lu}/^{175}\text{Lu}$ ratio of 0.02656 (Blichert-Toft et al., 1997) to calculate $^{176}\text{Lu}/^{177}\text{Hf}$ ratios. Similarly, the isobaric interference of ^{176}Yb on ^{176}Hf was corrected by using the recommended $^{176}\text{Yb}/^{173}\text{Yb}$ ratio of 0.7962 (Chu et al., 2002) to calculate $^{176}\text{Hf}/^{177}\text{Hf}$ ratios. The obtained $^{176}\text{Hf}/^{177}\text{Hf}$ ratios using this technique are 0.2822905 ± 0.0000035 (1r, MSWD = 2.6, n = 89) for 91500, 0.282019 ± 0.000004 (1r, MSWD = 4.5, n = 87) for GJ-1. These results are identical, within 2r, with the recommended $^{176}\text{Hf}/^{177}\text{Hf}$ ratios for 91500 (0.2823075 ± 58 , 2r) (Griffin et al., 2006; Wu et al., 2006) and GJ-1 (0.282015 ± 0.000019 , 2r) (Elhlou et al., 2006).

1.3. Major and trace element analyses

Whole-rock samples were crushed in a corundum jaw crusher (to 60 meshes). About 60 g of each sample was powdered in an agate ring mill to less than 200 meshes. Major elements were analyzed by an X-ray fluorescence (XRF) spectrometry at the WSSATC. The trace elements, including REE, HFSE, LILE and transition metals, were analyzed by an ICP-MS at the WSSATC, following the protocols of Liu et al. (2008a). Sample dissolution was conducted under clean lab conditions. The samples were digested in a mixture of distilled, concentrated HF + HNO₃ in Teflon bombs and analyzed with an Agilent 7500a ICP-MS. Approximately 50 mg sample powder was weighed into a Teflon bomb, moistened with a few drops of ultrapure water. Then 1.5 ml HNO₃+1.5 ml HF were added to the sample powder. The sealed Teflon bombs were heated at 190 °C in an oven for 48 h. Then sample solutions were evaporated on a hot plate at ~115 °C to dryness. This was followed by adding 1 ml HNO₃ and evaporating to the second round of dryness. The resultant salt was re-dissolved by adding ~3 ml of 30% HNO₃ and resealed and heated in the bomb at 190 °C for 12–24 h. The final solution was diluted with distilled water to ~100 g. A mixture of sample solution and of 2% HNO₃ were analyzed using an ICP-MS. International standards AGV-2, BHVO-2, BCR-2 and RGM-2 were used as reference materials to estimate analytical precision.

1.4. Sm-Nd isotopes

Whole-rock Nd isotopic ratios were analyzed on a Triton TI mass spectrometer (Thermo Finnigan, Germany) operated in static mode at the GPMR. Full details of the Sm-Nd procedures were reported in Gao et al. (2004). $^{147}\text{Sm}/^{144}\text{Nd}$ ratios were calculated from measured whole-rock Sm and Nd contents determined by ICP-MS. The measured Nd isotopic ratios were normalized to $^{146}\text{Nd}/^{144}\text{Nd} = 0.7219$. The JNDi-1 and BCR-2 standards measured during the analytical course gave $^{143}\text{Nd}/^{144}\text{Nd}$ of 0.512094 ± 7 (2σ , $n = 1$) and 0.512611 ± 2 (2σ , $n = 1$), respectively. The $\epsilon\text{Nd}(t)$ values are calculated by present-day ($^{147}\text{Sm}/^{144}\text{Nd}$)_{CHUR} = 0.1967 and ($^{143}\text{Nd}/^{144}\text{Nd}$)_{CHUR} = 0.512638. The $\epsilon\text{Nd}(t)$ values and initial Nd isotopic ratios were calculated at the interpreted formation age.

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Table S1. Detailed mineral assemblage of the studied samples	
Sample	Mineral assemblage
Gabbro	
DF04-04	Pl(40%)+Hbl(50%)+Ep(4%)+Mt(2%)+Ti(2%)+Ap(1%)+Zr(1%)
DF04-05	Pl(35%)+Hbl(45%)+Ep(5%)+Mt(2%)+Ti(5%)+Ap(2%)+Zr(1%)
DF04-09	Pl(35%)+Hbl(45%)+Ep(5%)+Mt(3%)+Ti(5%)+Ap(2%)+Zr(1%)
Basalts	
DF07-01	Pl(40%)+Hbl(45%)+Qtz(5%)+Ep(5%)+Mt(2%)+Ti(4%)+Ap(1%)
DF07-02	Pl(40%)+Hbl(45%)+Qtz(5%)+Ep(5%)+Mt(2%)+Ti(4%)+Ap(1%)
DF08-09	Pl(40%)+Hbl(45%)+Qtz(5%)+Ep(5%)+Mt(2%)+Ti(4%)+Ap(1%)
High-Mg basalts/andesite	
DF08-01	Pl(35%)+Hbl(50%)+Qtz(6%)+Ep(3%)+Mt(2%)+Ti(3%)+Ap(2%)
DF08-02	Pl(15%)+Hbl(70%)+Qtz(3%)+Ep(3%)+Mt(5%)+Ti(4%)+Ap(1%)
DF08-07	Pl(10%)+Hbl(75%)+Qtz(3%)+Ep(2%)+Mt(5%)+Ti(3%)+Ap(1%)
DF08-08	Pl(10%)+Hbl(75%)+Qtz(3%)+Ep(2%)+Mt(5%)+Ti(3%)+Ap(1%)
Granodiorite	
DF08-04	Pl(55%)+Qtz(20%)+Bt(10%)+Hbl(5%)+Ep(5%)+Ap(3%)+Zr(2%)
Nb-enriched basalt	
DF10-01	Pl(35%)+Hbl(45%)+Zo(3%)+Ep(4%)+Mt(2%)+Ti(4%)+Ap(2%)+Il(2%)
DF10-02	Pl(35%)+Hbl(45%)+Zo(2%)+Ep(8%)+Mt(2%)+Ti(4%)+Ap(3%)+Il(2%)
DF10-03	Pl(30%)+Hbl(50%)+Zo(2%)+Ep(5%)+Mt(3%)+Ti(5%)+Ap(5%)+Il(2%)

Abbreviation: Plagioclase (Pl), Hornblende (Hbl), Biotite (Bt), Quartz (Qtz), Zoisite (Zo), Epidote (Ep), Ilmenite (Il), Magnetite (Mt), Titanite (Ti), Apatite (Ap), Zircon (Zr)

Table S2. LA-ICP-MS U-Pb analytical data for spot analysis of single zircon of the studied samples

spots	Pb (ppm)	Th (ppm)	U (ppm)	Th/U	$^{207}\text{Pb}/^{235}\text{U}$	1σ	$^{206}\text{Pb}/^{238}\text{U}$	1σ	rho	$^{207}\text{Pb}/^{206}\text{Pb}$	1σ	$^{207}\text{Pb}/^{235}\text{U}$	1σ	Concordance
DF04-01														
DF04-01-01	115.63	571	353	1.62	5.9111	0.2752	0.2468	0.0109	0.9462	2606	34	1422	56	68%
DF04-01-02	45.73	32	76	0.42	10.5887	0.2605	0.4706	0.0052	0.4474	2483	40	2486	23	99%
DF04-01-03	92.08	573	491	1.17	3.3551	0.1293	0.1381	0.0046	0.8573	2638	42	834	26	43%
DF04-01-04	111.14	240	224	1.07	7.9574	0.1998	0.3367	0.0038	0.4473	2562	40	1871	18	82%
DF04-01-05	140.27	316	250	1.26	9.0279	0.2435	0.3791	0.0053	0.5170	2574	41	2072	25	87%
DF04-01-06	102.12	1262	569	2.22	2.5521	0.0866	0.1042	0.0025	0.7146	2628	44	639	15	32%
DF04-01-07	94.29	726	405	1.79	3.5496	0.1164	0.1420	0.0037	0.7857	2654	35	856	21	42%
DF04-01-08	109.02	558	339	1.64	4.7104	0.1212	0.1925	0.0036	0.7325	2626	34	1135	20	56%
DF04-01-09	126.13	256	191	1.34	10.1544	0.2169	0.4376	0.0053	0.5673	2600	33	2340	24	95%
DF04-01-10	122.05	360	323	1.11	6.1625	0.1578	0.2570	0.0044	0.6694	2594	37	1474	23	69%
DF04-01-11	100.51	112	162	0.69	10.3031	0.2522	0.4427	0.0043	0.3975	2540	40	2363	19	95%
DF04-01-12	80.59	191	168	1.13	7.6100	0.2007	0.3148	0.0039	0.4757	2606	43	1764	19	78%
DF04-01-13	74.15	605	535	1.13	2.0063	0.0491	0.0844	0.0010	0.4712	2570	39	522	6	27%
DF04-01-14	48.02	78	79	0.99	9.7263	0.2477	0.4090	0.0055	0.5265	2576	43	2211	25	91%
DF04-01-15	101.28	1505	711	2.12	1.8341	0.0463	0.0726	0.0008	0.4232	2669	47	452	5	19%
DF04-01-16	99.07	172	149	1.16	10.4324	0.2888	0.4498	0.0056	0.4473	2521	45	2395	25	96%
DF04-01-17	134.06	296	209	1.42	9.9179	0.3061	0.4238	0.0077	0.5922	2537	42	2278	35	93%
DF04-01-18	95.95	167	144	1.16	10.6115	0.2975	0.4504	0.0069	0.5426	2550	44	2397	30	96%
DF04-01-19	48.06	33	81	0.41	10.7699	0.2846	0.4675	0.0052	0.4243	2509	43	2473	23	98%
DF04-01-20	51.79	46	85	0.54	10.7924	0.2660	0.4669	0.0049	0.4283	2516	42	2470	22	98%
DF04-01-21	64.78	46	109	0.42	10.6387	0.2519	0.4681	0.0050	0.4544	2489	39	2475	22	99%
DF04-04														

DF04-04-01	108.10	514	159	3.24	8.5641	0.2114	0.3555	0.0041	0.4645	2590	39	1961	19	84%
DF04-04-02	68.04	172	86	2.00	10.6453	0.2432	0.4679	0.0049	0.4626	2499	40	2474	22	99%
DF04-04-03	66.37	117	95	1.23	10.5344	0.2555	0.4484	0.0051	0.4693	2554	42	2388	23	96%
DF04-04-04	119.07	734	428	1.71	3.7500	0.1128	0.1602	0.0020	0.4150	2524	39	958	11	50%
DF04-04-05	94.99	281	147	1.91	9.4576	0.2772	0.3979	0.0077	0.6606	2562	41	2159	36	90%
DF04-04-06	113.73	443	127	3.49	11.0637	0.2867	0.4683	0.0058	0.4740	2555	43	2476	25	97%
DF04-04-07	108.83	468	268	1.75	5.7840	0.1365	0.2574	0.0035	0.5724	2465	37	1477	18	72%
DF04-04-08	100.65	488	252	1.94	6.8382	0.2233	0.2966	0.0078	0.8034	2505	37	1674	39	77%
DF04-04-09	135.90	512	285	1.80	7.6877	0.3017	0.3257	0.0117	0.9190	2561	37	1818	57	81%
DF04-04-10	103.59	275	123	2.24	11.2738	0.2592	0.4665	0.0047	0.4418	2592	41	2468	21	96%
DF04-04-11	86.60	356	155	2.29	8.5192	0.2071	0.3615	0.0044	0.5039	2549	39	1989	21	86%
DF04-04-12	119.30	798	223	3.57	6.1546	0.2331	0.2675	0.0079	0.7814	2490	39	1528	40	73%
DF04-04-13	119.59	546	316	1.73	5.8978	0.1702	0.2606	0.0054	0.7244	2494	37	1493	28	72%
DF08-01														
DF08-01-01	56.81	48	91	0.53	10.5697	0.2560	0.4732	0.0055	0.4822	2461	41	2498	24	99%
DF08-01-02	99.41	157	324	0.49	5.0680	0.1053	0.2298	0.0022	0.4645	2440	36	1333	12	68%
DF08-01-03	61.44	269	476	0.56	3.0174	0.1832	0.1429	0.0084	0.9662	2387	37	861	47	51%
DF08-01-04	170.96	278	278	1.00	9.5689	0.1893	0.4299	0.0046	0.5382	2453	32	2305	21	96%
DF08-01-05	57.25	75	90	0.84	10.2319	0.2388	0.4606	0.0054	0.5035	2453	39	2442	24	99%
DF08-01-06	106.68	243	162	1.49	9.0587	0.2165	0.4176	0.0052	0.5217	2411	39	2249	24	95%
DF08-01-07	118.41	240	163	1.48	10.2120	0.3013	0.4642	0.0056	0.4090	2439	50	2458	25	99%
DF08-01-08	47.81	61	73	0.84	10.6974	0.2691	0.4734	0.0055	0.4585	2484	44	2498	24	99%
DF08-01-09	61.30	87	90	0.97	10.7960	0.2373	0.4783	0.0053	0.5022	2481	38	2520	23	99%
DF08-01-10	65.09	76	99	0.78	10.6718	0.2371	0.4814	0.0052	0.4832	2448	37	2533	22	98%
DF08-01-11	49.76	51	77	0.66	11.1259	0.2567	0.4831	0.0057	0.5083	2515	39	2541	25	99%

DF08-01-12	38.01	39	59	0.66	11.3181	0.2952	0.4925	0.0058	0.4481	2510	44	2581	25	98%
DF08-01-13	90.42	69	158	0.43	10.7130	0.3062	0.4673	0.0068	0.5111	2495	44	2471	30	98%
DF08-01-14	65.89	92	102	0.91	10.3775	0.2658	0.4639	0.0055	0.4602	2465	44	2457	24	99%
DF08-01-15	86.56	162	130	1.24	10.5538	0.2597	0.4474	0.0059	0.5344	2552	39	2384	26	95%
DF08-01-16	31.28	29	51	0.57	11.2317	0.2889	0.4711	0.0058	0.4767	2576	42	2489	25	97%
DF08-01-17	31.60	24	49	0.48	11.2388	0.2706	0.4917	0.0055	0.4669	2505	41	2578	24	98%
DF08-01-18	60.84	73	92	0.80	10.9936	0.2873	0.4834	0.0052	0.4110	2496	44	2542	23	99%
DF08-01-19	50.62	86	79	1.09	9.8832	0.2698	0.4278	0.0047	0.3982	2524	47	2296	21	94%
DF08-01-20	25.21	24	39	0.62	11.4255	0.3134	0.4872	0.0061	0.4542	2550	47	2559	26	99%
DF08-04														
DF08-04-01	56.04	53	89	0.60	11.8651	0.2883	0.4856	0.0060	0.5077	2606	42	2552	26	98%
DF08-04-02	81.26	137	154	0.89	9.4054	0.2331	0.3844	0.0055	0.5764	2606	45	2097	26	87%
DF08-04-03	54.70	62	90	0.68	11.2476	0.2486	0.4674	0.0058	0.5595	2583	38	2472	25	97%
DF08-04-04	76.09	100	124	0.80	11.0764	0.2439	0.4590	0.0056	0.5513	2584	36	2435	25	96%
DF08-04-05	68.61	90	119	0.76	10.5173	0.2305	0.4342	0.0052	0.5431	2591	29	2325	23	93%
DF08-04-06	82.47	95	137	0.69	10.6652	0.2103	0.4433	0.0046	0.5292	2583	33	2365	21	94%
DF08-04-07	52.31	54	87	0.62	11.0814	0.2345	0.4663	0.0059	0.5975	2569	37	2467	26	97%
DF08-04-08	67.64	81	98	0.83	11.6018	0.2222	0.4900	0.0056	0.5978	2561	32	2571	24	99%
DF08-04-09	63.37	66	99	0.67	11.7211	0.2356	0.4779	0.0053	0.5468	2616	32	2518	23	97%
DF08-04-10	70.51	81	110	0.74	11.2076	0.2159	0.4739	0.0054	0.5954	2561	33	2501	24	98%
DF08-04-11	58.95	60	88	0.67	11.7403	0.2361	0.4994	0.0054	0.5331	2550	34	2611	23	98%
DF08-04-12	43.59	42	70	0.60	11.0840	0.2459	0.4747	0.0057	0.5428	2546	38	2504	25	98%
DF08-04-13	69.32	77	109	0.71	11.0622	0.2554	0.4706	0.0053	0.4856	2544	40	2486	23	98%
DF08-04-14	105.81	152	160	0.95	10.9367	0.2204	0.4666	0.0054	0.5787	2547	37	2469	24	98%
DF08-04-15	72.89	98	115	0.85	10.7707	0.2274	0.4525	0.0049	0.5173	2574	35	2406	22	96%

DF08-04-16	56.84	63	91	0.69	10.6142	0.2319	0.4645	0.0052	0.5093	2506	36	2460	23	98%
DF08-04-17	61.63	63	94	0.67	11.3027	0.2269	0.4831	0.0050	0.5123	2545	38	2541	22	99%
DF08-04-18	24.26	21	35	0.61	11.8372	0.3162	0.5097	0.0067	0.4947	2539	45	2655	29	97%
DF08-04-19	72.14	86	118	0.73	10.0711	0.1978	0.4487	0.0048	0.5409	2480	33	2389	21	97%
DF08-04-20	75.83	79	120	0.65	10.9195	0.2351	0.4701	0.0052	0.5128	2532	35	2484	23	98%
DF08-04-21	65.93	98	119	0.83	9.3801	0.2430	0.4105	0.0060	0.5665	2509	42	2217	28	93%
DF08-04-22	35.60	43	58	0.74	10.3020	0.2550	0.4466	0.0052	0.4665	2528	43	2380	23	96%
DF08-04-23	62.23	74	109	0.67	9.6486	0.2074	0.4212	0.0045	0.4947	2508	35	2266	20	94%
DF08-04-24	31.28	28	48	0.59	11.2768	0.2589	0.4923	0.0057	0.5047	2516	45	2580	25	98%
DF08-04-25	59.76	72	91	0.79	10.9057	0.2509	0.4890	0.0057	0.5062	2478	39	2566	25	97%
DF08-04-26	67.74	100	102	0.98	10.8901	0.2685	0.4727	0.0060	0.5162	2517	38	2495	26	99%
DF08-04-27	68.46	81	108	0.75	10.6743	0.2731	0.4669	0.0055	0.4626	2506	44	2470	24	98%

Table S3. MC-ICP-MS Lu–Hf isotopic data for spot analysis of single zircon of the studied samples.										
Spots	T(Ma)	$^{176}\text{Yb}/^{177}\text{Hf}$	1σ	$^{176}\text{Lu}/^{177}\text{Hf}$	$\pm 1\sigma$	$^{176}\text{Hf}/^{177}\text{Hf}$	$\pm 1\sigma$	$\varepsilon_{\text{Hf}}(\text{t})$	$\pm 1\sigma$	$T_{\text{DM1}}^{\text{Hf}}(\text{Ma})$
DF04-01-01	2554	0.002853	0.000106	0.000119	0.000003	0.281329	0.000017	6.2	0.6	2622
DF04-01-02	2554	0.005111	0.000027	0.000260	0.000001	0.281388	0.000017	8.0	0.6	2553
DF04-01-03	2554	0.012386	0.000214	0.000429	0.000006	0.281379	0.000014	7.4	0.6	2576
DF04-01-04	2554	0.007612	0.000056	0.000255	0.000002	0.281312	0.000020	5.3	0.6	2655
DF04-01-05	2554	0.005951	0.000045	0.000299	0.000002	0.281391	0.000011	8.0	0.6	2551
DF04-01-06	2554	0.006288	0.000126	0.000307	0.000005	0.281388	0.000015	7.9	0.6	2556
DF04-01-07	2554	0.004478	0.000041	0.000225	0.000002	0.281392	0.000015	8.2	0.6	2545
DF04-01-08	2554	0.003346	0.000038	0.000167	0.000002	0.281376	0.000014	7.7	0.6	2563
DF04-04-01	2566	0.067810	0.000363	0.002209	0.000015	0.281449	0.000017	7.0	0.6	2602
DF04-04-02	2566	0.106577	0.001508	0.003470	0.000065	0.281422	0.000027	3.9	0.6	2732
DF04-04-03	2566	0.038957	0.000750	0.001087	0.000019	0.281324	0.000014	4.5	0.6	2696
DF08-01-01	2501	0.005428	0.000020	0.000179	0.000000	0.281350	0.000014	5.6	0.6	2598
DF08-01-02	2501	0.007135	0.000144	0.000233	0.000004	0.281344	0.000014	5.3	0.6	2610
DF08-01-03	2501	0.008273	0.000038	0.000276	0.000001	0.281325	0.000014	4.5	0.6	2639
DF08-01-04	2501	0.005835	0.000056	0.000192	0.000001	0.281325	0.000012	4.7	0.6	2633
DF08-01-05	2501	0.014787	0.000081	0.000587	0.000002	0.281327	0.000012	4.0	0.6	2657
DF08-01-06	2501	0.017237	0.000831	0.000630	0.000029	0.281357	0.000011	5.0	0.6	2620
DF08-01-07	2501	0.010316	0.000090	0.000343	0.000003	0.281351	0.000017	5.3	0.6	2608
DF08-01-08	2501	0.012208	0.000032	0.000377	0.000002	0.281358	0.000013	5.5	0.6	2601
DF08-01-09	2501	0.016316	0.000055	0.000435	0.000002	0.281356	0.000018	5.3	0.6	2607
DF08-01-10	2501	0.017387	0.000160	0.000567	0.000007	0.281361	0.000014	5.3	0.6	2610

DF08-01-11	2501	0.018399	0.000153	0.000698	0.000004	0.281365	0.000016	5.2	0.6	2613
DF08-04-01	2550	0.011743	0.000183	0.000494	0.000007	0.281324	0.000013	5.2	0.6	2654
DF08-04-02	2550	0.015503	0.000141	0.000644	0.000005	0.281332	0.000015	5.2	0.6	2654
DF08-04-03	2550	0.016293	0.000260	0.000690	0.000012	0.281328	0.000013	5.0	0.6	2663
DF08-04-04	2550	0.013266	0.000140	0.000558	0.000005	0.281337	0.000013	5.6	0.6	2642
DF08-04-05	2550	0.014484	0.000125	0.000610	0.000004	0.281342	0.000013	5.6	0.6	2639
DF08-04-06	2550	0.016376	0.000207	0.000688	0.000007	0.281338	0.000012	5.4	0.6	2648
DF08-04-07	2550	0.014488	0.000166	0.000627	0.000006	0.281335	0.000011	5.4	0.6	2649
DF08-04-08	2550	0.019011	0.000212	0.000796	0.000006	0.281344	0.000012	5.4	0.6	2648

Table S4. Measured and recommended trace element concentrations (ppm) for AGV-2, BHVO-2, BCR-2 and RGM2										
Sample Name	AGV-2	AGV-2	BHVO-2	BHVO-2	BCR-2	BCR-2	RGM2	RGM2	DF08-07	DF08-07*
Analysis No.	Sample	Ref	Sample	Ref	Sample	Ref	Sample	Ref	Sample	D*
Li	10.06	11.00	4.34	4.80	8.84	9.00	58.75	57.00	9.30	9.03
Be	2.21	2.30	1.01	1.00	2.17		2.46	2.37	1.88	1.76
Sc	12.38	13.00	32.32	32.00	33.26	33.00	4.47	4.40	37.43	36.45
V	118.04	120.00	321.27	317.00	414.95	416.00	11.92	13.00	210.64	204.83
Cr	14.39	16.22	286.99	280.00	15.11	16.50	3.79	5.90	762.34	756.40
Co	15.25	16.00	45.10	45.00	37.77	37.00	1.94	2.00	60.90	59.33
Ni	19.21	20.00	124.97	119.00	12.47	13.00	2.84	5.20	330.36	331.86
Cu	50.45	53.00	129.74	127.00	18.81	18.40	9.21	9.60	27.16	26.65
Zn	86.24	86.00	104.05	103.00	133.06	133.00	30.71	32.00	144.16	148.72
Ga	21.04	20.00	21.64	21.70	22.15	23.00	16.50	16.55	13.46	13.60
Rb	68.70	66.30	9.11	9.11	47.26	46.90	147.38	150.00	5.29	5.03
Sr	663.83	661.00	396.92	396.00	338.78	340.00	105.04	107.50	606.23	599.82
Y	20.23	20.00	26.47	26.00	36.52	37.00	22.96	23.16	48.36	48.34
Zr	231.67	230.00	169.87	172.00	183.12	184.00	221.40	220.00	94.76	92.06
Nb	14.41	14.50	19.05	18.10	12.13	12.60	8.99	9.30	5.71	5.57
Sn	2.18	1.83	1.77	1.70	1.95	2.03	3.35	3.34	1.10	1.18
Cs	1.12	1.16	0.10	0.10	1.08	1.10	9.66	9.60	0.24	0.17
Ba	1120.43	1130.00	133.14	131.00	667.00	677.00	828.09	810.00	126.74	125.26
La	38.28	37.90	15.85	15.20	24.87	24.90	23.07	24.00	213.80	213.79
Ce	69.77	68.60	38.05	37.50	52.59	52.90	45.66	47.00	492.98	486.26
Pr	8.10	7.84	5.32	5.35	6.65	6.70	5.19	5.36	64.92	65.48

Nd	30.83	30.50	24.76	24.50	28.16	28.70	18.96	19.00	257.28	259.70
Sm	5.73	5.49	6.20	6.07	6.66	6.58	3.90	4.30	40.96	42.71
Eu	1.58	1.54	2.06	2.07	1.90	1.96	0.68	0.66	8.39	8.32
Gd	4.79	4.52	6.33	6.24	6.58	6.75	3.54	3.70	28.63	29.43
Tb	0.64	0.64	1.00	0.92	1.05	1.07	0.61	0.66	2.84	2.84
Dy	3.64	3.47	5.52	5.31	6.55	6.41	3.65	4.10	11.96	11.51
Ho	0.68	0.65	0.99	0.98	1.29	1.28	0.77	0.82	1.70	1.69
Er	1.83	1.81	2.61	2.54	3.65	3.66	2.27	2.35	4.16	4.28
Tm	0.26	0.26	0.35	0.33	0.53	0.54	0.36	0.37	0.44	0.44
Yb	1.67	1.62	2.04	2.00	3.36	3.38	2.53	2.60	2.58	2.61
Lu	0.25	0.25	0.28	0.27	0.50	0.50	0.39	0.40	0.35	0.35
Hf	5.27	5.00	4.35	4.36	4.91	4.90	5.95	6.20	3.24	3.09
Ta	0.86	0.87	1.19	1.14	0.78	0.78	0.91	0.95	0.26	0.25
Tl	0.31	0.27	0.03	0.06	0.27		0.93	0.93	0.09	0.04
Pb	13.29	13.20	1.86	1.60	10.08	11.00	19.98	19.27	4.92	4.86
Th	6.32	6.10	1.24	1.22	5.98	5.70	14.62	15.10	10.43	10.39
U	1.96	1.86	0.43	0.40	1.70	1.69	5.67	5.80	1.96	1.92

Analyzed international standard materials include AGV-2, BHVO-2, BCR-2 and RGM2. The recommended value of the standard materials is from http://minerals.cr.usgs.gov/geo_chem_stand/, <http://georem.mpch-mainz.gwdg.de/> and Govindaraju G.(1994). D*=duplicate. References: Govindaraju G. Compilation of working values and sample description for 383 geostandards. Geostandards Newslett. 1994,18: 1-158. Liu YS, Zong KQ, Kelemen PB and Gao S, 2008. Geochemistry and magmatic history of eclogites and ultramafic rocks from the Chinese continental scientific drill hole: subduction and ultrahigh-pressure metamorphism of lower crustal cumulates. Chemical Geology, 247: 133-153.