GSA Data Repository Item 2019157

Ming Wang, Cai Li, Xiao-Wen Zeng, Hang Li, Jian-Jun Fan, Chao-Ming Xie and Yu-Jie Hao, 2019, Petrogenesis of the southern Qiangtang mafic dykes, Tibet: link to a late Paleozoic mantle plume on the northern margin of Gondwana?: GSA Bulletin, https://doi.org/10.1130/B35110.1.

Data Repository

Table DR1. Zircon LA–ICP–MS U–Th–Pb data of the gabbro samples from southern Qiangtang, Tibet.

Table DR2. Major (wt.%) and trace element (ppm) data of mafic rock samples from southern Qiangtang, Tibet.

Table DR3. Zircon Hf isotopic data of gabbro samples from southern Qiangtang, Tibet.

Table DR4. Sr–Nd isotopic data of mafic dykes from southern Qiangtang, Tibet.

Table DR1. Zircon LA–ICP–MS U–Th–Pb data of the gabbro samples from southern Qiangtang, Tibet.

Spots	element content（$\times10^{-6}$）			Th/U	isotope ratio（±1σ）			age（Ma±1σ）		
	Th	U	Pb		$^{207}Pb/^{206}Pb$	$^{207}Pb/^{235}U$	$^{206}Pb/^{238}U$	$^{207}Pb/^{206}Pb$	$^{207}Pb/^{235}U$	$^{206}Pb/^{238}U$
RT3, gabbro samples.										
RT3-01	492.7	384.2	21.6	1.28	0.0521	0.3151	0.0438	292	278	276
RT3-02	286.2	244.3	13.3	1.17	0.0521	0.3112	0.0433	288	275	273
RT3-03	183.7	200.0	11.4	0.92	0.0550	0.3458	0.0456	412	302	287
RT3-04	412.1	345.0	22.6	1.19	0.0662	0.4205	0.0461	811	356	291
RT3-05	262.4	277.5	14.9	0.95	0.0520	0.3289	0.0458	287	289	289
RT3-06	424.1	338.1	19.5	1.25	0.0521	0.3278	0.0456	289	288	288
RT3-07	319.2	247.8	15.9	1.29	0.0530	0.3550	0.0486	328	308	306
RT3-08	318.4	254.1	15.1	1.25	0.0584	0.3806	0.0473	543	327	298
RT3-09	185.5	212.2	11.2	0.87	0.0520	0.3271	0.0456	285	287	287
RT3-10	226.4	216.1	12.0	1.05	0.0522	0.3348	0.0465	294	293	293
RT3-11	375.8	272.1	16.4	1.38	0.0565	0.3598	0.0461	473	312	291
RT3-12	232.4	250.0	13.2	0.93	0.0521	0.3229	0.0450	288	284	284
RT3-13	287.5	247.1	13.8	1.16	0.0520	0.3199	0.0446	284	282	282
RT3-14	423.3	385.9	22.9	1.10	0.0526	0.3564	0.0491	312	310	309
RT3-15	255.7	212.4	13.1	1.20	0.0518	0.3423	0.0479	276	299	302
RT3-16	175.5	169.3	9.4	1.04	0.0521	0.3310	0.0461	288	290	291
RT3-17	301.1	278.2	15.4	1.08	0.0521	0.3280	0.0457	288	288	288
RT3-18	298.3	295.3	16.3	1.01	0.0521	0.3311	0.0461	289	290	290
RT3-19	339.5	289.1	16.3	1.17	0.0592	0.3620	0.0444	573	314	280
RT3-20	216.9	233.5	12.4	0.93	0.0534	0.3243	0.0441	346	285	278
RT3-21	362.2	315.9	18.0	1.15	0.0546	0.3481	0.0463	395	303	291
RT3-22	186.8	201.6	10.9	0.93	0.0522	0.3315	0.0461	292	291	290
RT3-23	472.3	307.1	19.1	1.54	0.0522	0.3363	0.0467	295	294	294
GT4, gabbro samples.										
GT4-01	343.7	272.2	17.6	1.3	0.05262	0.36585	0.05042	312	317	317
GT4-02	40.3	105.9	5.6	0.4	0.05334	0.37189	0.05055	343	321	318
GT4-03	53.4	99.0	5.5	0.5	0.05295	0.36814	0.05042	327	318	317
GT4-04	60.9	103.4	5.8	0.6	0.05243	0.36544	0.05054	304	316	318
GT4-05	91.2	119.9	6.9	0.8	0.05329	0.37128	0.05052	341	321	318
GT4-06	112.6	191.7	10.7	0.6	0.05297	0.36836	0.05043	328	318	317
GT4-07	81.8	149.7	8.2	0.5	0.05287	0.36784	0.05045	323	318	317
GT4-08	43.1	58.8	3.4	0.7	0.05246	0.36497	0.05045	306	316	317
GT4-09	54.3	83.9	4.7	0.6	0.05306	0.36895	0.05042	331	319	317
GT4-10	235.9	246.0	15.0	1.0	0.05357	0.3731	0.0505	353	322	318
GT4-11	78.5	140.5	7.8	0.6	0.05294	0.36903	0.05055	326	319	318
GT4-12	88.2	149.3	8.3	0.6	0.05265	0.36703	0.05055	314	317	318
GT4-13	34.6	61.3	3.4	0.6	0.05343	0.37155	0.05043	347	321	317
GT4-14	54.9	74.2	4.3	0.7	0.05264	0.36641	0.05048	313	317	317
GT5, gabbro samples.										
GT5-01	1531.1	874.8	60.0	1.8	0.05199	0.34933	0.04872	285	304	307
GT5-02	561.6	353.5	23.5	1.6	0.05248	0.35242	0.0487	306	307	307
GT5-03	1117.6	674.5	45.1	1.7	0.05246	0.35246	0.04872	306	307	307
GT5-04	955.8	652.0	42.2	1.5	0.05262	0.35378	0.04876	312	308	307

Table DR1. (Continued).

Spots	element content（$\times10^{-6}$）			Th/U	isotope ratio（±1σ）			age（Ma±1σ）		
	Th	U	Pb		$^{207}Pb/^{206}Pb$	$^{207}Pb/^{235}U$	$^{206}Pb/^{238}U$	$^{207}Pb/^{206}Pb$	$^{207}Pb/^{235}U$	$^{206}Pb/^{238}U$
GT5-05	267.6	253.3	15.1	1.1	0.05274	0.35396	0.04867	318	308	306
GT5-06	1228.7	699.8	48.2	1.8	0.05254	0.35303	0.04873	309	307	307
GT5-07	290.1	279.9	16.5	1.0	0.05221	0.35013	0.04862	295	305	306
GT5-08	1202.5	733.3	48.8	1.6	0.05364	0.35709	0.04828	356	310	304
GT10, gabbro samples.										
GT10-01	4900.7	1164.8	102.4	4.2	0.05174	0.30719	0.04305	274	272	272
GT10-02	4176.7	1182.9	105.7	3.5	0.05232	0.3506	0.04859	299	305	306
GT10-03	472.1	443.5	25.2	1.1	0.05217	0.33871	0.04708	293	296	297
GT10-04	2589.7	1048.4	76.3	2.5	0.05241	0.35729	0.04943	303	310	311
GT10-05	716.7	392.7	25.4	1.8	0.05186	0.31996	0.04474	279	282	282
GT10-06	4560.3	1818.6	134.9	2.5	0.05224	0.33298	0.04622	296	292	291
GT10-07	2046.3	1106.3	72.3	1.8	0.05225	0.33261	0.04616	296	292	291
GT11, gabbro samples.										
GT11-01	308.0	269.2	16.1	1.1	0.05223	0.34651	0.04811	295	302	303
GT11-02	1668.7	993.2	64.4	1.7	0.05227	0.34332	0.04763	297	300	300
GT11-03	358.4	309.6	18.2	1.2	0.0523	0.33872	0.04697	299	296	296
GT11-04	2163.0	1185.4	75.2	1.8	0.05212	0.31955	0.04446	291	282	280
GT11-05	964.7	489.7	34.2	2.0	0.05225	0.34344	0.04767	296	300	300
GT11-06	1559.4	954.6	62.8	1.6	0.05243	0.3452	0.04774	304	301	301
GT11-07	853.2	512.1	33.0	1.7	0.05229	0.34318	0.04759	298	300	300
GT11-08	696.5	510.9	30.6	1.4	0.05206	0.32576	0.04537	288	286	286
GT11-09	1046.3	779.2	48.1	1.3	0.05255	0.35074	0.0484	309	305	305
GT3, gabbro samples.										
GT3-01	608.0	391.9	23.5	1.6	0.05194	0.3199	0.04466	283	282	282
GT3-02	3496.2	2335.5	148.5	1.5	0.05246	0.3491	0.04825	306	304	304
GT4-03	528.4	517.1	29.0	1.0	0.05209	0.32888	0.04578	289	289	289
GT4-04	92.3	144.0	7.4	0.6	0.05197	0.3284	0.04582	284	288	289
GT3a, gabbro samples.										
GT3a-01	829.6	464.3	31.0	1.8	0.0521	0.349	0.04858	290	304	306
GT3a-02	349.7	242.7	14.1	1.4	0.05037	0.31422	0.04523	212	277	285
GT3a-03	703.5	452.8	28.4	1.6	0.05276	0.349	0.04796	318	304	302
GT3a-04	746.6	458.5	29.5	1.6	0.05146	0.34159	0.04813	261	298	303
GT10a, gabbro samples.										
GT10a-01	2436.2	1043.8	73.2	2.3	0.05166	0.32598	0.04576	270	286	288
GT10a-02	2477.7	1428.5	88.7	1.7	0.05196	0.32662	0.04558	284	287	287
GT10a-03	1446.5	732.5	49.6	2.0	0.05228	0.34007	0.04716	298	297	297
GT10a-04	1750.8	1079.3	66.7	1.6	0.0524	0.34164	0.04728	303	298	298
GT10a-05	3335.9	1210.1	88.6	2.8	0.05177	0.31331	0.04388	275	277	277
GT10a-06	1670.3	1006.9	62.6	1.7	0.05225	0.33584	0.04661	296	294	294
GT10a-07	3802.1	2111.1	135.1	1.8	0.05242	0.34396	0.04758	304	300	300
GT10a-08	1571.0	1166.5	67.8	1.3	0.05221	0.33637	0.04672	295	294	294
GT10a-09	1795.7	940.4	59.8	1.9	0.05189	0.31611	0.04417	281	279	279
GT10a-10	6418.2	2011.9	169.4	3.2	0.05229	0.3445	0.04777	298	301	301
GT10a-11	3249.0	1951.8	119.4	1.7	0.05203	0.329	0.04585	287	289	289
GT10a-12	3123.4	870.6	71.0	3.6	0.05241	0.34468	0.04768	303	301	300

Table DR1. (Continued).

Spots	element content（$\times10^{-6}$）			Th/U	isotope ratio（±1σ）			age（Ma±1σ）		
	Th	U	Pb		$^{207}Pb/^{206}Pb$	$^{207}Pb/^{235}U$	$^{206}Pb/^{238}U$	$^{207}Pb/^{206}Pb$	$^{207}Pb/^{235}U$	$^{206}Pb/^{238}U$
GT11a, gabbro samples.										
GT11a-01	2127.3	973.4	66.7	2.2	0.05239	0.33699	0.04664	302	295	294
GT11a-02	1232.5	851.7	50.3	1.4	0.05216	0.33214	0.04617	292	291	291
GT11a-03	792.5	490.0	29.8	1.6	0.05247	0.33471	0.04625	306	293	291
GT11a-04	727.1	486.1	30.2	1.5	0.0524	0.34558	0.04782	303	301	301
GT11a-05	317.9	251.1	13.9	1.3	0.05208	0.32141	0.04475	289	283	282
GT11a-06	1106.3	701.2	43.9	1.6	0.05233	0.34013	0.04713	300	297	297
GT11a-07	455.7	320.1	17.9	1.4	0.05231	0.33262	0.0461	299	292	291
GT11a-08	276.7	228.1	12.6	1.2	0.05195	0.32942	0.04598	283	289	290
GT11a-09	6147.2	2963.6	208.2	2.1	0.05273	0.36477	0.05016	317	316	316
DYT6, gabbro samples.										
DYT6-01	492.7	384.2	21.6	1.28	0.05239	0.32094	0.04442	302	283	280
DYT6-02	286.2	244.3	13.3	1.17	0.05374	0.33131	0.04471	360	291	282
DYT6-03	183.7	200.0	11.4	0.92	0.05285	0.36547	0.05014	322	316	315
DYT6-04	412.1	345.0	22.6	1.19	0.06798	0.44329	0.0473	368	373	298
DYT6-05	262.4	277.5	14.9	0.95	0.05139	0.31553	0.04452	358	278	281
DYT6-06	424.1	338.1	19.5	1.25	0.06355	0.41984	0.04792	327	356	302
DYT6-07	319.2	247.8	15.9	1.29	0.06409	0.4222	0.04776	345	358	301
DYT6-08	318.4	254.1	15.1	1.25	0.05515	0.33856	0.04451	318	296	281
DYT6-09	185.5	212.2	11.2	0.87	0.06035	0.36998	0.04446	316	320	280
DYT6-10	226.4	216.1	12.0	1.05	0.06503	0.42509	0.04741	375	360	299
DYT6-11	472.3	307.1	19.1	1.54	0.05793	0.38595	0.04831	327	331	304
DYT3, gabbro samples.										
DYT3-01	68.6	123.8	6.3	0.554	0.05309	0.33559	0.04584	333	294	289
DYT3-02	36.8	56.4	4.0	0.653	0.05336	0.32249	0.04383	344	284	277
DYT3-03	44.7	67.6	3.6	0.660	0.05192	0.3279	0.04579	282	288	289
DYT3-04	158.4	155.6	9.0	1.018	0.05276	0.33453	0.04597	318	293	290
DYT3-05	63.1	84.7	4.6	0.744	0.05207	0.32915	0.04583	288	289	289
DYT3-06	71.9	125.7	7.0	0.572	0.05147	0.31202	0.04397	262	276	277
DYT3-07	79.2	108.6	5.9	0.729	0.05242	0.33112	0.04579	304	290	289
DYT3-08	81.9	98.3	5.3	0.833	0.05213	0.32681	0.04545	291	287	287
GT6, gabbro samples.										
GT6-01	811.1	680.6	40.1	1.2	0.05215	0.34333	0.04774	292	300	301
GT6-02	371.4	313.3	17.3	1.2	0.05126	0.31664	0.04479	253	279	282
GT6-03	1168.5	842.8	48.7	1.4	0.05191	0.32056	0.04478	281	282	282
GT6-04	449.0	424.4	23.5	1.1	0.05332	0.32989	0.04486	342	289	283
GT6-05	261.3	214.1	10.8	1.2	0.05186	0.30174	0.04219	279	268	276
GT6-06	425.5	410.7	21.6	1.0	0.05093	0.31485	0.04483	238	278	283
GT6-07	280.4	334.4	17.2	0.8	0.05246	0.32369	0.04474	306	285	282
GT6-08	662.6	491.5	27.0	1.3	0.05153	0.32216	0.04533	265	284	286
GT6-09	674.5	567.9	32.1	1.2	0.05255	0.32318	0.0446	309	284	281
GT6-10	333.9	340.3	18.4	1.0	0.05205	0.32901	0.04584	288	289	289
GT6-11	478.9	470.7	25.1	1.0	0.05217	0.32205	0.04477	293	283	282
GT6-12	645.7	469.9	27.0	1.4	0.05225	0.32265	0.04478	296	284	282

Table DR1. (Continued).

Spots	element content（$\times10^{-6}$）			Th/U	isotope ratio（±1σ）			age（Ma±1σ）		
	Th	U	Pb		$^{207}Pb/^{206}Pb$	$^{207}Pb/^{235}U$	$^{206}Pb/^{238}U$	$^{207}Pb/^{206}Pb$	$^{207}Pb/^{235}U$	$^{206}Pb/^{238}U$
GT6-13	962.6	674.4	38.3	1.4	0.05242	0.32231	0.04459	304	284	281
GT6-14	739.3	577.0	33.4	1.3	0.05211	0.3316	0.04615	290	291	291
GT6-15	788.4	606.5	34.8	1.3	0.05163	0.31935	0.04485	269	281	283
GT6-16	879.6	603.3	35.7	1.5	0.05169	0.31912	0.04477	272	281	282
GT6-17	1126.7	701.8	46.7	1.6	0.05281	0.35894	0.04929	321	311	310
GT6-18	701.2	595.8	32.7	1.2	0.05199	0.32164	0.04486	285	283	283
GT6a, gabbro samples.										
GT6a-01	315.5	278.6	15.1	1.1	0.05221	0.33003	0.04583	295	290	289
GT6a-02	396.7	369.8	19.9	1.1	0.05208	0.3309	0.04607	289	290	290
GT6a-03	502.7	412.3	21.3	1.2	0.05178	0.31324	0.04386	276	277	277
GT6a-04	1433.9	902.5	53.5	1.6	0.05203	0.31893	0.04445	287	281	280
GT6a-05	417.1	328.3	17.7	1.3	0.05183	0.31889	0.04461	278	281	281
GT6a-06	408.6	345.4	18.9	1.2	0.05222	0.32932	0.04573	295	289	288
GT6a-07	634.4	444.2	24.5	1.4	0.05191	0.32305	0.04513	281	284	285
GT6a-08	977.3	638.1	36.5	1.5	0.05191	0.31796	0.04442	281	280	280
GT6a-09	605.6	496.1	26.9	1.2	0.05195	0.32151	0.04488	283	283	283
GT6a-10	240.6	233.4	12.2	1.0	0.05122	0.32366	0.04582	251	285	289
GT6a-11	265.0	234.2	12.7	1.1	0.05198	0.3237	0.04516	285	285	285
GT6a-12	521.9	410.8	22.6	1.3	0.05204	0.32966	0.04593	287	289	289
GT6a-13	652.6	539.1	29.8	1.2	0.05249	0.33398	0.04613	307	293	291

Table DR2. Major (wt.%) and trace element (ppm) data of mafic rock samples from southern Qiangtang, Tibet.

Lithology	gabbro samples (QHT)									
Sample	DYT3H1	DYT3H2	DYT3H3	DYT3H4	GT5H1	GT5H2	GT5H3	GT5H4	GT5H5	GT5H6
SiO_2	50.69	50.41	50.59	49.81	48.47	48.1	48.42	47.58	46.8	48.56
TiO_2	4.16	4.13	4.17	4.18	3.61	3.82	3.67	3.67	3.85	3.62
Al_2O_3	11.96	12.3	11.92	12.4	11.26	11.53	11.65	11.66	11.96	11.36
Fe_2O_3T[a]	14.56	14.47	14.62	14.7	15.15	15.17	14.9	15.6	15.66	15.37
$Mg^{\#}$[b]	39.9	40.9	40.1	40.8	46.5	44.8	45.9	45.5	45.1	43.6
MnO	0.19	0.19	0.2	0.19	0.19	0.2	0.2	0.22	0.22	0.18
MgO	4.84	5	4.89	5.06	6.58	6.16	6.32	6.52	6.44	5.94
CaO	8.29	7.97	8.48	8.53	9.03	8.91	8.62	8.75	8.77	8.64
Na_2O	2.28	2.41	2.3	2.32	2.71	2.89	2.82	2.83	2.97	2.73
K_2O	1.35	1.4	1.13	1.15	0.26	0.3	0.36	0.38	0.4	0.39
P_2O_5	0.67	0.65	0.65	0.66	0.39	0.41	0.41	0.4	0.43	0.43
LOl	1.23	1.29	1.25	1.29	2.08	2.22	2.34	2.13	2.28	2.47
La	39.54	38.16	37.82	36.37	23.26	24.22	23.98	23.46	24.28	24.2
Ce	88.28	84.21	82.99	81.61	56.8	59.34	58.32	57.7	59.06	57.88
Pr	12.49	12.09	11.95	11.5	7.85	8.16	8	7.9	8.07	8.05
Nd	53.61	52.04	51.53	49.62	35.76	37.06	36.28	35.9	36.62	36.48
Sm	12.67	12.23	12.16	11.68	8.96	9.25	8.99	8.97	9.09	9.07
Eu	4.63	4.57	4.42	4.29	2.91	2.96	2.98	2.98	3	2.94
Gd	12.91	12.57	12.38	11.92	9.4	9.62	9.43	9.34	9.44	9.46
Tb	1.8	1.76	1.72	1.67	1.37	1.4	1.38	1.37	1.37	1.37
Dy	9.98	9.72	9.52	9.2	7.83	8.09	7.87	7.84	7.89	7.89
Ho	1.84	1.81	1.77	1.7	1.47	1.51	1.48	1.46	1.48	1.48
Er	4.63	4.48	4.42	4.26	3.77	3.87	3.77	3.76	3.8	3.79
Tm	0.58	0.57	0.55	0.53	0.49	0.49	0.48	0.49	0.49	0.48
Yb	3.5	3.43	3.36	3.25	2.89	2.96	2.9	2.9	2.91	2.9
Lu	0.47	0.46	0.45	0.43	0.39	0.41	0.39	0.4	0.4	0.4
Y	43.81	42.52	42.17	40.61	34.76	35.84	35.4	35	35.42	35.66
Ba	361.4	364	282	297.6	72.7	93.18	98.4	108.14	132.04	146.68
Rb	51.98	57.2	43.12	41.52	6.6	8.94	9.94	12.63	12.11	12.51
Sr	518.1	501.9	532	559.8	416	383.4	355.6	358.8	378.8	393.4
Nb	41.04	39.38	39.55	38.7	31.6	33.06	32.24	30.08	31.5	28.73
Ta	2.47	2.37	2.39	2.58	2.03	2.06	1.98	2.22	2	1.79
U	1.33	1.24	1.24	1.63	0.56	0.6	0.58	0.6	0.6	0.62
Th	5.37	5.06	5.05	4.82	2.39	2.53	2.49	2.47	2.49	2.41
Zr	384.64	371.04	368.16	360	250.56	264.06	265.14	263.34	269.64	259.2
Hf	8.92	8.63	8.44	8.13	6.2	6.54	6.47	6.47	6.62	6.38
Ti	30736	30672	30176	29616	23960	24760	23940	23460	24420	22800
K	11648	12020	9467	9569	2174	2432	2894	3098	3114	3134
P	3237	3169	3101	3110	1875	2000	1949	1926	2042	2052
V	407.29	408.85	394.94	395.33	428.4	431.6	416.8	416.6	431.6	412.2
Cr	31.72	34.11	31.46	33.55	227.8	186.76	200.8	206.2	189.66	170.44
Ni	28.5	28.8	27.55	28.43	128.26	115.38	122.22	126.9	117.6	104.44
∑REE	246.93	238.1	235.04	228.03	163.15	169.34	166.25	164.47	167.9	166.39
Eu/Eu*[c]	1.11	1.13	1.10	1.11	0.97	0.96	0.99	1.00	0.99	0.97
Th/Ta	2.17	2.14	2.11	1.87	1.18	1.23	1.26	1.11	1.25	1.35
Ti/Y	702	721	716	729	689	691	676	670	689	639
Nb/La	1.04	1.03	1.05	1.06	1.36	1.36	1.34	1.28	1.30	1.19
Nb/Th	7.64	7.78	7.83	8.03	13.22	13.07	12.95	12.18	12.65	11.92

No a: $Fe_2O_3T = Fe_2O_3 + 1.1FeO$; b: $Mg^{\#} = [100 \times \text{molar Mg}/(\text{Mg} + \text{Fe})]$.

c: Eu/Eu* = (Eu/0.168)/SQRT((Sm/0.444) × (Gd/0.596)). Geochemical data of sample Tg109, P45T1, Tg11, T41, T51 and P904 were previously published by Wang et al., 2014a, b.

Table DR2. (Continued).

Lithology	gabbro samples (QHT)									
Sample	GT3H1	GT3H2	GT3H3	GT3H4	GT3H5	GT4H1	GT4H2	GT4H3	GT4H4	GT4H5
SiO_2	45.33	43.83	47.1	49.98	45.43	47.56	47.11	47.99	45.85	46.94
TiO_2	4.89	5.27	3.19	2.3	3.26	2.88	3.14	2.92	2.98	3.27
Al_2O_3	11.69	11.4	11.68	14.1	11.39	10.79	12.57	11.19	11.32	11.57
Fe_2O_3T[a]	14.37	14.9	14.82	11.7	15.49	13.16	14.62	13.5	13.65	15.67
$Mg^{\#}$[b]	51.5	52.4	52.0	51.9	53.1	49.5	50.6	51.1	50.9	50.4
MnO	0.18	0.19	0.2	0.17	0.21	0.18	0.19	0.18	0.18	0.21
MgO	7.62	8.21	8.01	6.31	8.78	6.45	7.48	7.04	7.06	7.96
CaO	11.13	11.63	10.45	9.93	11.19	8.73	8.83	8.55	9.37	9.99
Na_2O	2.31	2.1	2.27	2.48	2.22	1.92	2.66	2.61	2.44	2.2
K_2O	0.18	0.36	0.08	0.92	0.03	0.59	1.05	1.29	1.11	0.22
P_2O_5	0.6	0.51	0.36	0.25	0.38	0.31	0.34	0.31	0.31	0.28
LOl	1.61	1.57	1.7	1.72	1.56	7.15	1.82	4.14	5.53	1.54
La	19.82	17.05	19.02	18.05	19.07	12.97	14.3	13.54	13.59	15.09
Ce	49.02	42.56	45.78	41.94	45.84	32.5	35.96	34.14	34.02	38.74
Pr	6.91	6.03	6.26	5.51	6.27	4.71	5.14	4.86	4.85	5.55
Nd	32.14	28.28	28.08	23.82	27.9	21.76	23.52	22.16	22.42	26.18
Sm	7.82	6.94	6.82	5.55	6.83	5.57	5.89	5.54	5.63	6.73
Eu	2.74	2.49	2.21	1.71	2.14	1.71	2.07	1.9	1.74	2.27
Gd	7.94	7.18	7.27	5.75	7.26	5.98	6.25	5.93	6.07	7.29
Tb	1.1	1.01	1.06	0.84	1.05	0.89	0.92	0.87	0.88	1.07
Dy	6.34	5.75	6.31	5.11	6.23	5.33	5.57	5.25	5.32	6.35
Ho	1.16	1.06	1.18	0.99	1.17	1.01	1.05	1	1.02	1.21
Er	2.87	2.62	3.01	2.63	2.97	2.63	2.72	2.56	2.6	3.13
Tm	0.36	0.33	0.39	0.36	0.39	0.35	0.36	0.34	0.34	0.41
Yb	2.2	2.01	2.38	2.24	2.37	2.1	2.19	2.08	2.09	2.48
Lu	0.3	0.27	0.33	0.32	0.33	0.29	0.3	0.29	0.29	0.34
Y	30.2	27.34	30.92	26.56	31.16	26.8	28.06	26.92	26.72	29.36
Ba	93.96	123.48	46.14	176.38	41.72	112.58	135.16	131.92	95.84	62.1
Rb	3.77	7.35	1.78	24.38	0.35	24.42	33.08	43.5	36.98	4.15
Sr	581.8	521.4	409.6	384	389.2	139.5	339.6	210.4	177.8	351.2
Nb	28.56	25.8	27.65	19.99	27.78	19.42	20.14	18.51	18.66	19.97
Ta	1.83	1.67	1.64	1.2	1.63	1.17	1.85	1.11	1.16	1.33
U	1.22	0.73	0.7	1.08	0.73	0.45	0.48	0.44	0.47	0.43
Th	2.95	2.59	2.67	4.89	2.69	1.8	1.9	1.79	1.8	1.63
Zr	322.66	289.68	218.62	167.35	223.55	179.12	185.4	171.83	170.37	198.72
Hf	7.84	7.08	5.41	4.39	5.42	4.42	4.57	4.21	4.24	4.9
Ti	30660	32480	19690	13642	20120	19000	18828	18442	18126	20500
K	1773	3064	1014	6822	700	5090	8136	10080	8430	1743
P	3390	2796	1989	1356	2072	1824	1910	1814	1795	1390
V	437	441	377.8	298.6	387.4	397.8	412	397.6	394.2	470.4
Cr	222	254.8	212	114.8	238	214.4	233.8	224.8	214	264
Ni	162.16	166.92	129.76	63.06	135.30	103.34	114.96	108.70	102.48	121.62
∑REE	140.72	123.58	130.1	114.82	129.82	97.8	106.24	100.46	100.86	116.84
Eu/Eu*[c]	1.06	1.08	0.96	0.93	0.93	0.91	1.04	1.02	0.91	0.99
Th/Ta	1.61	1.55	1.63	4.08	1.65	1.54	1.03	1.61	1.55	1.23
Ti/Y	1015	1188	637	514	646	709	671	685	678	698
Nb/La	1.44	1.51	1.45	1.11	1.46	1.50	1.41	1.37	1.37	1.32
Nb/Th	9.68	9.96	10.36	4.09	10.33	10.79	10.60	10.34	10.37	12.25

No a: $Fe_2O_3T = Fe_2O_3 + 1.1FeO$; b: $Mg^{\#} = [100 \times \text{molar Mg}/(\text{Mg} + \text{Fe})]$.

c: Eu/Eu* = (Eu/0.168)/SQRT((Sm/0.444)×(Gd/0.596)). Geochemical data of sample Tg109, P45T1, Tg11, T41, T51 and P904 were previously published by Wang et al., 2014a, b.

Table DR2. (Continued).

Lithology	gabbro samples (QHT)									
Sample	GT6H1	GT6H2	GT6H3	GT6H4	GT6H5	GT6H6	GT11H1	GT11H2	GT11H3	P904h1
SiO_2	45.33	45.05	45.97	46.45	44.91	44.76	45.5	44.25	44.97	45.9
TiO_2	4.34	4.97	4.55	4.66	4.77	5.12	4.69	5.04	4.88	4.88
Al_2O_3	11.12	12.99	12.38	12.26	12.16	12.63	11.66	12.93	11.96	11.63
Fe_2O_3T[a]	17.12	15.7	15.82	15.92	16.36	15.98	15.67	15.17	16.24	18.05
$Mg^{\#}$[b]	43.3	41.4	43.2	41.6	43.0	41.1	45.8	43.6	45.5	38.5
MnO	0.23	0.19	0.18	0.2	0.19	0.19	0.19	0.2	0.2	0.18
MgO	6.54	5.55	6.01	5.67	6.16	5.58	6.61	5.87	6.77	5.64
CaO	9.48	9.41	9.22	8.79	9.6	8.92	8.51	7.75	9.95	9.07
Na_2O	2.44	3.25	2.93	2.79	2.72	3.29	2.8	2.68	2.11	2.2
K_2O	0.73	0.69	0.45	0.78	0.47	0.93	0.75	0.37	0.84	0.61
P_2O_5	0.36	0.36	0.35	0.37	0.36	0.38	0.31	0.51	0.34	0.26
LOl	2.11	1.7	1.94	1.88	2.13	2.03	3.08	5.05	1.59	1.35
La	16.12	16.04	15.64	16.35	15.54	16.28	16.49	27.05	18.04	16.42
Ce	40.1	39.48	37.96	40.36	38.16	39.8	39.27	62.75	42.92	37.93
Pr	5.67	5.51	5.27	5.68	5.49	5.64	5.48	8.58	5.92	5.26
Nd	26.06	25	23.78	25.84	24.58	25.52	23.71	36.5	25.54	24.19
Sm	6.53	6.14	5.88	6.38	6	6.32	5.88	8.89	6.29	6.01
Eu	2.16	2.09	2.03	2.15	2.04	2.12	1.92	2.42	2.03	2.02
Gd	6.87	6.44	6.09	6.73	6.24	6.6	5.9	9	6.36	6.18
Tb	1.01	0.95	0.88	0.98	0.9	0.96	0.89	1.38	0.94	0.92
Dy	5.99	5.53	5.21	5.77	5.37	5.72	5.27	8.32	5.66	5.21
Ho	1.12	1.04	0.97	1.08	1.01	1.07	1	1.56	1.06	0.94
Er	2.86	2.64	2.46	2.74	2.53	2.71	2.54	4.01	2.73	2.44
Tm	0.37	0.34	0.32	0.36	0.33	0.35	0.34	0.53	0.36	0.32
Yb	2.27	2.13	1.96	2.19	2.03	2.13	2.01	3.16	2.14	1.88
Lu	0.31	0.29	0.27	0.3	0.28	0.3	0.28	0.43	0.3	0.26
Y	30.24	28.42	26.72	29.08	27.74	29.28	26.62	41.92	28.94	22.62
Ba	149.88	107.5	95.64	159.98	132.18	176.64	462	113.8	233.6	101.58
Rb	15.45	16.07	10.59	16.95	11.61	24.64	15.4	5.46	20.36	21.1
Sr	276.4	438.6	366.6	314.6	387.2	305	472.2	149.08	582.6	292.9
Nb	19.27	26.18	25.12	25.76	24.28	26.54	25.97	39.31	28.03	28.35
Ta	1.12	1.62	1.48	1.58	1.41	1.55	1.68	2.51	1.82	2.04
U	0.55	0.59	0.56	0.58	0.52	0.62	0.76	1.19	0.79	0.57
Th	1.99	2.08	1.98	2.12	1.93	2.08	2.9	4.63	3.07	1.92
Zr	206.82	198.05	185.13	193.8	183.94	198.9	179.52	283.9	193.12	196.86
Hf	5	4.96	4.67	5	4.53	5.03	4.52	6.74	4.77	4.83
Ti	27780	30580	29060	30500	29440	31980	31060	32080	32660	33972
K	5942	5754	4070	6602	4148	7734	7122	3894	8586	5217
P	2170	2126	2114	2204	2156	2276	2000	3336	2368	1091
V	571	501	528.6	521.4	539	513.6	514.8	482	530.2	604.5
Cr	110.14	41.54	92.46	65.38	91.34	51.54	85.96	53.1	84.44	8.8
Ni	105.76	74.42	99.52	91.00	96.16	89.14	95.00	65.18	95.98	60.23
∑REE	117.44	113.62	108.72	116.91	110.5	115.52	110.98	174.58	120.29	109.98
Eu/Eu*[c]	0.99	1.02	1.04	1.00	1.02	1.01	1.00	0.83	0.98	1.01
Th/Ta	1.78	1.28	1.34	1.34	1.37	1.34	1.73	1.84	1.69	0.94
Ti/Y	919	1076	1088	1049	1061	1092	1167	765	1129	1502
Nb/La	1.20	1.63	1.61	1.58	1.56	1.63	1.57	1.45	1.55	1.73
Nb/Th	9.68	12.59	12.69	12.15	12.58	12.76	8.96	8.49	9.13	14.77

No a: $Fe_2O_3T = Fe_2O_3 + 1.1FeO$; b: $Mg^{\#} = [100 \times \text{molar Mg}/(\text{Mg} + \text{Fe})]$.

c: Eu/Eu* = (Eu/0.168)/SQRT((Sm/0.444)×(Gd/0.596)). Geochemical data of sample Tg109, P45T1, Tg11, T41, T51 and P904 were previously published by Wang et al., 2014a, b.

Table DR2. (Continued).

Lithology	gabbro samples (QHT)									
Sample	P904h2	P904h3	P904h4	P904h5	P904h6	T105h1	T105h2	T105h3	T105h4	T105h5
SiO_2	45.13	53.2	45.39	48.95	45.5	51.21	47.78	50.13	48.81	50.93
TiO_2	5.08	4.04	4.99	2.6	4.77	3.31	3.22	3.08	3.24	3.22
Al_2O_3	11.87	9.78	11.71	12.79	11.65	13.77	14.52	14.76	14.03	12.74
Fe_2O_3T[a]	18.67	15.56	18.83	13.32	17.6	14.15	14.92	13.81	14.6	14.03
$Mg^{\#}$[b]	37.5	37.6	37.5	52.1	39.1	35.3	38.9	36.3	38.7	39.7
MnO	0.18	0.15	0.18	0.18	0.18	0.19	0.2	0.18	0.2	0.18
MgO	5.6	4.69	5.64	7.26	5.65	3.86	4.75	3.93	4.6	4.61
CaO	8.87	7.5	8.69	9.29	9.51	9.26	10.34	9.38	10.14	9.78
Na_2O	2.22	1.67	2.23	2.7	2.19	1.56	2.21	2.35	1.73	2.35
K_2O	0.68	0.65	0.66	0.7	0.7	0.26	0.52	0.57	0.77	0.35
P_2O_5	0.27	0.22	0.27	0.28	0.26	0.35	0.37	0.37	0.37	0.36
LOl	1.33	1.43	1.27	1.31	1.79	1.84	1.23	1.37	1.48	1.43
La	17.27	14.36	16.19	18.75	16.19	25.44	25.14	23.83	24.57	25.47
Ce	39.7	32.8	37.69	42.64	37.38	60.94	60.14	57.48	59.22	56.79
Pr	5.43	4.53	5.17	5.77	5.2	8.09	7.97	7.6	7.82	7.72
Nd	25.08	20.98	23.98	26.08	24.04	36.15	35.7	34.22	35.06	34.13
Sm	6.19	5.22	5.93	6.18	5.95	8.8	8.74	8.35	8.56	8.02
Eu	2.07	1.76	1.98	2.08	2.01	2.74	2.67	2.62	2.63	2.6
Gd	6.39	5.45	6.12	6.24	6.18	8.85	8.81	8.47	8.72	8.12
Tb	0.95	0.81	0.91	0.92	0.93	1.3	1.3	1.25	1.28	1.24
Dy	5.38	4.61	5.13	5.14	5.24	7.56	7.59	7.28	7.48	6.9
Ho	0.97	0.83	0.91	0.92	0.94	1.39	1.38	1.33	1.37	1.28
Er	2.53	2.18	2.4	2.42	2.49	3.74	3.72	3.58	3.7	3.49
Tm	0.33	0.28	0.31	0.31	0.32	0.55	0.55	0.53	0.54	0.48
Yb	1.95	1.67	1.84	1.85	1.89	3.15	3.1	2.99	3.04	2.77
Lu	0.27	0.23	0.25	0.26	0.26	0.44	0.44	0.42	0.43	0.39
Y	23.24	19.97	22.13	22.28	22.6	36.82	36.9	35.42	36.38	34.52
Ba	111.6	97.68	106.7	183.46	110.06	209.29	344.6	519	633.4	173.8
Rb	22.16	26	21.64	15.02	25.2	4.86	8.54	11.31	13.27	5.44
Sr	299.4	255.8	282.7	365.8	297.6	536.88	587.4	561.2	550	622.82
Nb	29.52	24.18	28.11	29.78	27.76	37.64	35.56	34.98	36.62	34.77
Ta	1.81	1.48	1.73	1.74	1.68	2.46	2.28	2.26	2.76	2.05
U	0.52	0.45	0.52	0.41	0.61	0.57	0.56	0.52	0.52	0.48
Th	2.06	1.67	1.88	2	1.93	2.71	2.63	2.44	2.52	2.28
Zr	200.6	180.12	171.8	207.6	197.12	258.74	255.93	252.13	259.92	262
Hf	5.03	4.41	4.39	5.01	4.86	6.25	6.24	6.12	6.23	6.01
Ti	34800	27920	32928	17668	31760	21428	20197	19779	20653	23740
K	5656	5576	5363	5726	5768	2505	4744	5296	6784	3186
P	1103	949	1075	1110	1039	1573	1538	1620	1553	1594
V	626.2	502.4	559.5	308.6	578.2	395.7	393.2	377.4	387.4	438.4
Cr	24.58	12.46	21.84	211.4	6.4	13.56	28.76	16.58	21.48	41.66
Ni	84.54	61.46	82.43	118.12	65.22	29.39	41.50	32.58	36.20	50.55
∑REE	114.51	95.71	108.81	119.56	109.02	169.14	167.25	159.95	164.42	159.4
Eu/Eu*[c]	1.01	1.01	1.01	1.03	1.01	0.95	0.93	0.95	0.93	0.99
Th/Ta	1.14	1.13	1.09	1.15	1.15	1.10	1.15	1.08	0.91	1.11
Ti/Y	1497	1398	1488	793	1405	582	547	558	568	688
Nb/La	1.71	1.68	1.74	1.59	1.71	1.48	1.41	1.47	1.49	1.37
Nb/Th	14.33	14.48	14.95	14.89	14.38	13.89	13.52	14.34	14.53	15.25

No a: $Fe_2O_3T = Fe_2O_3 + 1.1FeO$; b: $Mg^{\#} = [100 \times \text{molar Mg}/(\text{Mg} + \text{Fe})]$.

c: Eu/Eu* = (Eu/0.168)/SQRT((Sm/0.444)×(Gd/0.596)). Geochemical data of sample Tg109, P45T1, Tg11, T41, T51 and P904 were previously published by Wang et al., 2014a, b.

Table DR2. (Continued).

Lithology	gabbro samples (QHT)						basalt samples (QHT)			
Sample	T105h6	T105h7	Tg104h1	T104h2	T104h3	T104h4	Tg109h9	Tg109h8	Tg109h7	Tg109h6
SiO_2	51.58	50.43	46.74	51.9	49.35	50.08	50	46.12	49.32	48.99
TiO_2	3.57	3.35	3.23	2.86	3.59	3.29	4.75	4.77	4.73	4.8
Al_2O_3	12.51	13.75	15.32	13.44	14.18	12.27	8.95	9.98	9.04	9.16
Fe_2O_3T[a]	13.82	14.11	14.81	12.92	13.68	13.8	13.71	14.67	13.81	13.71
$Mg^{\#}$[b]	40.4	36.5	35.9	42.0	41.2	42.6	52.4	52.0	52.7	53.0
MnO	0.15	0.18	0.2	0.15	0.16	0.15	0.17	0.18	0.17	0.17
MgO	4.68	4.05	4.14	4.67	4.8	5.13	7.55	7.95	7.7	7.72
CaO	8.15	9.68	10.58	7.36	8.15	9.7	7.87	8.86	8.26	8.28
Na_2O	2.85	2.26	2.59	3.43	3.69	2.26	2.7	2.95	2.54	2.62
K_2O	0.72	0.59	0.35	0.95	0.78	1.26	1.67	1.98	1.63	1.7
P_2O_5	0.25	0.38	0.37	0.27	0.29	0.26	0.63	0.82	0.75	0.77
LOl	1.35	1.24	1.86	1.73	1.23	1.58	1.99	1.7	2.03	2.07
La	17.21	24.75	24.59	17.77	17.75	16.25	65.06	63.16	63.54	61.72
Ce	42.76	55.37	59.12	44.08	44.22	40.88	139.12	135.04	139.36	133.3
Pr	5.76	7.57	7.87	5.85	5.96	5.59	17.03	16.66	17.3	16.89
Nd	26.52	33.54	35.54	26.56	27.4	25.76	70.83	70.25	72.35	70.6
Sm	6.76	7.9	8.73	6.69	7.02	6.68	13.13	13.06	13.57	13.2
Eu	2.15	2.59	2.71	2.04	2.17	2.11	3.75	3.78	3.84	3.74
Gd	7.04	7.96	8.8	6.69	7.22	6.86	10.83	10.72	11.21	10.99
Tb	1.01	1.22	1.29	0.96	1.05	0.99	1.38	1.38	1.43	1.4
Dy	5.57	6.78	7.51	5.39	5.79	5.5	7.17	7.07	7.34	7.15
Ho	0.96	1.27	1.37	0.92	1	0.94	1.22	1.2	1.25	1.22
Er	2.39	3.44	3.71	2.33	2.5	2.35	2.94	2.89	3.02	2.94
Tm	0.33	0.48	0.54	0.33	0.34	0.32	0.39	0.39	0.4	0.39
Yb	1.77	2.76	3.08	1.76	1.87	1.74	2.27	2.24	2.34	2.27
Lu	0.24	0.39	0.44	0.24	0.26	0.23	0.31	0.3	0.31	0.3
Y	24.94	33.88	36.4	24.02	25.68	24.36	36.64	34.96	36.2	37.44
Ba	574.2	365.47	262.6	625.4	411.6	683.6	783.86	952.6	715.44	787.82
Rb	17.98	10.74	6.34	17.81	17.5	65.36	41.84	46.74	39.64	38.7
Sr	986.6	494.94	617.6	739.2	518.4	894.2	207.8	220	213.2	220.6
Nb	16.37	34.92	35.3	16.53	18.12	16.58	63.54	58.98	59.95	61.66
Ta	1.15	2.06	2.32	1.15	1.31	1.12	4.29	4.18	4.25	4.12
U	0.57	0.49	0.57	0.61	0.62	0.56	1.85	1.84	1.84	1.68
Th	2.62	2.37	3.07	2.92	2.93	2.58	7.67	7.5	7.89	7.48
Zr	182.32	268.5	264.1	183.14	195.13	172.63	516.98	491.24	502.72	513.81
Hf	4.91	6.16	6.39	4.82	5.23	4.73	13.24	12.88	13.48	12.83
Ti	23218	23446	20463	17421	22192	22021	33040	31472	32176	33392
K	6410	5773	3104	8158	6718	11904	21280	22680	18984	21440
P	1097	1581	1574	1169	1218	1214	4696	5282	4912	5704
V	496.8	408.5	381.6	394.8	426.4	545.8	493.2	480.4	433.2	462.2
Cr	3.42	20.02	15.44	51.38	4.33	24.1	508.2	445.2	485.6	498.6
Ni	9.97	36.29	32.84	29.04	11.46	28.08	263.80	214.40	264.20	255.20
∑REE	120.47	156.02	165.3	121.61	124.55	116.2	335.43	328.14	337.26	326.11
Eu/Eu*[c]	0.95	1.00	0.95	0.93	0.93	0.95	0.96	0.98	0.95	0.95
Th/Ta	2.28	1.15	1.32	2.54	2.24	2.30	1.79	1.79	1.86	1.82
Ti/Y	931	692	562	725	864	904	902	900	889	892
Nb/La	0.95	1.41	1.44	0.93	1.02	1.02	0.98	0.93	0.94	1.00
Nb/Th	6.25	14.73	11.50	5.66	6.18	6.43	8.28	7.86	7.60	8.24

No a: $Fe_2O_3T = Fe_2O_3 + 1.1FeO$; b: $Mg^{\#} = [100 \times \text{molar Mg}/(\text{Mg} + \text{Fe})]$.

c: Eu/Eu* = (Eu/0.168)/SQRT((Sm/0.444)×(Gd/0.596)). Geochemical data of sample Tg109, P45T1, Tg11, T41, T51 and P904 were previously published by Wang et al., 2014a, b.

Table DR2. (Continued).

Lithology	basalt samples (QHT)									
Sample	Tg109h5	Tg109h3	Tg109h2	Tg109h10	Tg109h1	P4005H1	P4005H2	P4005H3	P4005H4	P4005H5
SiO_2	48.19	49.29	49.58	48.7	49.22	48.21	48.5	47.77	46.96	46.67
TiO_2	4.88	4.62	4.69	4.95	4.6	4.19	3.99	4.27	4.27	4.28
Al_2O_3	9.36	9.45	8.78	9.09	9.45	12.04	11.58	11.96	11.99	12.05
Fe_2O_3T[a]	14.09	13.74	13.75	14.31	13.73	16.94	16.9	17.54	17.71	17.77
$Mg^{\#}$[b]	52.9	53.1	52.7	51.9	52.7	31.5	29.6	31.2	31.2	31.7
MnO	0.18	0.18	0.17	0.18	0.17	0.22	0.22	0.21	0.2	0.23
MgO	7.91	7.78	7.67	7.72	7.66	3.9	3.55	3.97	4.01	4.12
CaO	8.22	7.98	8.48	8.03	7.78	8.31	8.45	7.6	7.63	7.75
Na_2O	2.78	2.56	2.68	2.63	2.73	1.48	1.36	2.46	2.6	2.59
K_2O	1.64	1.57	1.63	1.59	1.75	3.28	2.81	2.05	2.03	1.98
P_2O_5	0.8	0.77	0.78	0.78	0.78	0.78	0.74	0.76	0.77	0.77
LOl	1.93	2.06	1.77	2.01	2.11	0.3	1.43	1.01	1.51	1.5
La	67.38	65.96	64.63	66.44	67.88	45.2	44.14	45.16	45.78	46.12
Ce	143.48	142.26	140.13	142.88	143.3	99.48	99.21	101	101.64	103.3
Pr	18.11	17.62	17.46	18.03	18	12.81	12.56	12.87	12.94	13.14
Nd	76	72.95	73.49	75.41	75.2	55.86	54.88	56.42	56.58	57.52
Sm	14.01	13.48	13.68	13.99	13.79	12.45	12.25	12.67	12.66	12.84
Eu	3.98	3.86	3.91	3.98	3.95	3.69	3.59	3.66	3.63	3.67
Gd	11.55	11.19	11.38	11.56	11.4	12.4	12.15	12.54	12.61	12.69
Tb	1.48	1.42	1.46	1.49	1.45	1.8	1.76	1.83	1.83	1.84
Dy	7.54	7.24	7.52	7.64	7.48	10.06	9.93	10.25	10.23	10.34
Ho	1.28	1.24	1.28	1.3	1.27	1.81	1.79	1.85	1.85	1.87
Er	3.13	2.97	3.11	3.13	3.08	4.79	4.77	4.91	4.93	4.96
Tm	0.41	0.4	0.41	0.42	0.41	0.62	0.63	0.65	0.64	0.65
Yb	2.42	2.29	2.41	2.43	2.36	3.75	3.76	3.85	3.85	3.89
Lu	0.32	0.31	0.32	0.32	0.31	0.51	0.52	0.53	0.53	0.53
Y	38.26	37.02	37	37.52	37.66	43.26	42.87	44.48	44.44	45.12
Ba	808.94	799.92	905.96	738.98	869.22	674.6	774.14	454	477.8	487.6
Rb	37.54	39.3	35.79	37.46	43.76	45.66	40.85	37.06	37.74	34.16
Sr	242.6	226.4	221.33	217.2	226.6	454.4	571.6	438.2	422	433.8
Nb	63.29	61.74	61.37	63.24	61.98	66.9	66	67.96	68.14	68.34
Ta	4.52	4.28	4.43	4.55	4.34	4.25	4.16	4.3	4.39	4.31
U	1.85	1.8	1.81	1.97	1.83	1.45	1.44	1.48	1.47	1.47
Th	8.18	7.76	8.03	8.06	7.98	5.85	5.87	6.07	6.07	6.08
Zr	533.21	512.23	510.41	525.89	521.73	435.82	420.71	437.6	435.2	433.8
Hf	13.85	13.19	13.68	13.97	13.48	9.83	10.17	10.41	10.41	10.44
Ti	34208	32512	32576	34032	33728	27400	27281	28640	29280	28940
K	19818	19456	19412	19274	22060	27060	23820	16752	16924	16538
P	5356	5432	5550	5408	5406	2936	2982	2972	2996	3038
V	494	482.8	466.09	495.6	486.6	305.8	317.09	337.2	337.8	336.4
Cr	499.8	458.6	480.54	497.2	469.8	27.74	31.06	41.26	43.14	34.5
Ni	240.40	219.00	232.72	243.20	235.60	31.68	33.34	42.44	41.38	35.38
∑REE	351.09	343.19	341.19	349.02	349.88	265.23	261.94	268.19	269.7	273.36
Eu/Eu*[c]	0.96	0.96	0.96	0.96	0.96	0.91	0.90	0.89	0.88	0.88
Th/Ta	1.81	1.81	1.81	1.77	1.84	1.38	1.41	1.41	1.38	1.41
Ti/Y	894	878	880	907	896	633	636	644	659	641
Nb/La	0.94	0.94	0.95	0.95	0.91	1.48	1.50	1.50	1.49	1.48
Nb/Th	7.74	7.96	7.64	7.85	7.77	11.44	11.24	11.20	11.23	11.24

No a: $Fe_2O_3T = Fe_2O_3 + 1.1FeO$; b: $Mg^{\#} = [100 \times \text{molar Mg}/(\text{Mg} + \text{Fe})]$.

c: Eu/Eu* = (Eu/0.168)/SQRT((Sm/0.444)×(Gd/0.596)). Geochemical data of sample Tg109, P45T1, Tg11, T41, T51 and P904 were previously published by Wang et al., 2014a, b.

Table DR2. (Continued).

Lithology	basalt samples (QHT)									
Sample	P4005H6	P4005H7	P4005H8	P4005H9	P4005H10	Tg12H2	Tg12H7	Tg12H8	Tg12H9	Tg12H10
SiO_2	48.01	47.85	48.27	47.13	48.85	48.89	48.45	48.48	48.61	47.75
TiO_2	4.24	4.24	4.27	4.36	4.43	3.72	3.68	3.78	3.63	3.57
Al_2O_3	11.65	11.64	11.58	12.01	12.14	15.38	14.49	14.29	13.95	14.45
Fe_2O_3T[a]	16.92	17.02	17.01	17.09	15.52	14.25	15.23	14.65	14.93	14.51
$Mg^{\#}$[b]	30.2	30.0	30.4	30.5	29.6	43.9	43.8	45.0	44.5	45.1
MnO	0.21	0.2	0.22	0.23	0.24	0.19	0.2	0.19	0.19	0.18
MgO	3.66	3.64	3.71	3.75	3.26	5.56	5.93	5.99	5.98	5.96
CaO	8.88	8.75	7.9	8.45	7.87	3.65	4.14	4.57	4.63	5.51
Na_2O	2	1.98	2.85	2.96	4.22	4.14	4.11	3.76	4.12	4.08
K_2O	1.88	1.82	1.32	1.35	0.64	1.47	0.99	1.63	0.92	1.06
P_2O_5	0.77	0.77	0.77	0.8	0.8	0.49	0.46	0.39	0.47	0.48
LOl	1.35	1.66	1.58	1.52	1.44	1.8	1.87	1.82	2.05	2.04
La	46.84	45.65	46.52	47.04	49.64	26.46	25.9	21.62	26.28	26.76
Ce	105.52	101.92	104.54	106.64	110.14	63.7	62.14	52.24	63.4	64.26
Pr	13.34	12.94	13.35	13.41	13.94	8.9	8.69	7.35	8.87	8.94
Nd	58.42	56.54	58.58	58.6	60.9	41.36	40.6	34.48	41.5	41.64
Sm	13.05	12.69	13.12	13.08	13.56	10	9.84	8.5	10.06	10.07
Eu	3.83	3.79	3.77	3.82	3.9	3.15	3.17	2.98	3.21	3.12
Gd	12.94	12.57	13.03	12.92	13.44	10.16	10.01	8.76	10.24	10.25
Tb	1.89	1.83	1.9	1.88	1.96	1.49	1.47	1.3	1.51	1.51
Dy	10.56	10.21	10.58	10.56	10.96	8.36	8.33	7.35	8.46	8.48
Ho	1.91	1.85	1.91	1.91	1.97	1.5	1.5	1.33	1.53	1.54
Er	5.08	4.92	5.01	5.08	5.26	3.98	3.98	3.52	4	4.04
Tm	0.66	0.64	0.66	0.66	0.68	0.52	0.52	0.46	0.52	0.53
Yb	3.99	3.86	3.9	4	4.12	3.09	3.09	2.7	3.14	3.11
Lu	0.54	0.53	0.53	0.54	0.56	0.42	0.42	0.37	0.43	0.43
Y	45.72	44.45	45.5	45.84	47.64	35.86	35.7	31.34	35.54	35.82
Ba	639.6	497.47	321	329.6	112.04	481	317.2	699.2	331.4	414.4
Rb	29.24	29.28	24.86	25.22	14.89	23.76	16.28	23.88	14.72	18.84
Sr	555.8	545.1	423.2	443.8	230.4	199	200.4	224.6	203.2	265
Nb	69.7	68.51	71.18	70.52	73.18	38.44	37.48	33.28	38.06	37.86
Ta	4.37	4.41	4.51	4.43	4.6	2.56	2.46	2.22	2.53	2.56
U	1.56	1.47	1.76	1.6	1.22	0.69	0.68	0.57	0.7	0.71
Th	6.18	6.05	6.24	6.25	6.51	2.51	2.46	1.97	2.46	2.57
Zr	452.8	440.83	426.4	452.4	468.8	344.6	341.8	293.8	344	345
Hf	10.81	10.45	10.34	10.75	11.18	8.39	8.32	7.23	8.6	8.52
Ti	29100	28800	29300	28660	30580	25500	25960	26060	25700	24860
K	16408	15372	11468	11268	5512	12988	8706	13696	7850	8824
P	3108	3045	3238	3132	3176	2016	1943	1622	1979	1977
V	339.2	332.99	323	332.6	351.8	394.4	398.6	390.6	393.8	387
Cr	34.84	33.44	44	31.52	33.2	96.78	97.4	91.92	86.64	90.16
Ni	35.48	35.53	39.16	34.30	34.82	85.62	82.78	78.80	76.86	79.98
∑REE	278.57	269.94	277.4	280.14	291.03	183.09	179.66	152.96	183.15	184.68
Eu/Eu*[c]	0.90	0.92	0.88	0.90	0.88	0.96	0.98	1.06	0.97	0.94
Th/Ta	1.41	1.37	1.38	1.41	1.42	0.98	1.00	0.89	0.97	1.00
Ti/Y	636	648	644	625	642	711	727	832	723	694
Nb/La	1.49	1.50	1.53	1.50	1.47	1.45	1.45	1.54	1.45	1.41
Nb/Th	11.28	11.32	11.41	11.28	11.24	15.31	15.24	16.89	15.47	14.73

No a: $Fe_2O_3T = Fe_2O_3 + 1.1FeO$; b: $Mg^{\#} = [100 \times \text{molar Mg}/(\text{Mg} + \text{Fe})]$.

c: Eu/Eu* = (Eu/0.168)/SQRT((Sm/0.444)×(Gd/0.596)). Geochemical data of sample Tg109, P45T1, Tg11, T41, T51 and P904 were previously published by Wang et al., 2014a, b.

Table DR2. (Continued).

Litholog	gabbro samples (QLT)										
Sample	DYT1H1	DYT2H1	DYT2H2	DYT4H1	DYT4H2	DYT4H3	DYT5H1	DYT5H2	DYT5H3	DYT5H4	DYT5H5
SiO_2	50.45	49.68	51.33	48.84	50.37	51.67	53.3	54.39	53.79	54.16	53.58
TiO_2	2.49	1.77	1.74	1.69	1.61	1.95	1.37	1.49	1.72	1.49	1.11
Al_2O_3	13.44	12.24	12.34	13.87	13.99	16.9	13.9	13.19	13.05	13.42	13.72
Fe_2O_3T[a]	14.06	11.64	11.03	13.25	12.32	14.55	10.63	10.47	11.6	10.46	9.79
$Mg^{\#}$[b]	47.8	63.9	60.6	54.8	54.9	55.1	58.2	54.0	51.8	55.2	59.4
MnO	0.2	0.18	0.18	0.2	0.19	0.23	0.17	0.16	0.17	0.17	0.17
MgO	6.44	10.29	8.48	8.03	7.5	8.91	7.41	6.15	6.24	6.45	7.16
CaO	9.91	10.52	9.21	10.95	10.33	12.59	7.34	9.73	8.5	9.13	9.88
Na_2O	1.96	1.64	1.95	2.11	2.15	2.55	2.21	1.73	1.91	1.93	1.78
K_2O	0.65	0.82	1.46	0.48	0.5	0.37	0.84	0.51	0.45	0.64	0.83
P_2O_5	0.25	0.33	0.35	0.18	0.18	0.22	0.15	0.13	0.15	0.15	0.1
LOl	0.49	1.44	2.23	0.92	1.25	1.19	2.77	2.05	2.43	2.02	2
La	15.1	29.61	33.41	11.59	11.71	11.53	17.9	17.12	17.33	19.92	13.99
Ce	39.1	61.55	68.65	26.9	27.07	26.69	40.23	38.45	38.56	44.52	31.42
Pr	5.61	8.05	8.8	3.69	3.69	3.64	5.15	4.93	5.03	5.69	4.04
Nd	24.86	31.46	33.83	16.28	16.24	16.07	20.91	20.31	20.65	23.16	16.71
Sm	6.41	6.61	7.04	4.37	4.37	4.32	5.04	4.91	4.98	5.56	4.09
Eu	2.1	1.91	1.99	1.54	1.55	1.51	1.49	1.54	1.57	1.64	1.29
Gd	7.3	6.67	7.01	5.39	5.32	5.28	5.48	5.5	5.57	6.13	4.61
Tb	1.12	0.95	0.99	0.85	0.85	0.83	0.83	0.83	0.84	0.93	0.7
Dy	6.79	5.47	5.72	5.46	5.41	5.32	5.06	5.12	5.18	5.7	4.36
Ho	1.34	1.06	1.11	1.13	1.12	1.1	1.01	1.04	1.04	1.15	0.87
Er	3.53	2.75	2.89	3.12	3.08	3.04	2.73	2.8	2.8	3.09	2.36
Tm	0.46	0.36	0.38	0.42	0.42	0.41	0.37	0.38	0.37	0.42	0.32
Yb	2.89	2.28	2.41	2.74	2.75	2.68	2.39	2.42	2.43	2.68	2.07
Lu	0.39	0.31	0.33	0.39	0.38	0.37	0.33	0.33	0.33	0.37	0.28
Y	31.01	23.78	25.49	26.78	26.64	26.12	24.2	24.44	24.41	27	20.7
Ba	74.88	316.4	404.6	179.8	181.6	128.6	407.9	574	652.6	361.4	281.4
Rb	21.92	28.8	74.4	11.42	14.18	6.51	28.67	17.07	14.82	22.62	30.48
Sr	291.7	421	372.5	239.7	256	252.3	232.3	305	258.6	277.1	320
Nb	12.5	26.91	29.81	9.78	9.97	9.73	11.86	11.48	11.31	13.28	8.95
Ta	0.69	1.8	1.96	0.63	0.67	0.61	0.81	0.73	0.72	1.19	0.58
U	0.43	1.06	1.22	0.42	0.47	0.38	0.9	0.86	0.83	1.04	0.73
Th	1.03	5.23	6.02	1.43	1.43	1.42	4.15	4.01	3.94	5.05	3.19
Zr	155.6	138.6	151.8	93.73	96.45	93.95	122.9	114.6	113.4	135.3	94.34
Hf	3.88	3.64	3.85	2.43	2.47	2.38	2.98	2.92	2.9	3.39	2.39
Ti	14437	10403	10574	10131	10234	10136	8642	9602	10760	9406	7258
K	4208	5242	9719	3268	3622	2067	5993	3636	3190	4584	6240
P	919	1197	1321	727	737	722	612	563	630	643	482
V	339.4	214.2	211.6	286.5	279.7	287.1	244.1	275.3	341.5	257.1	225.0
Cr	124.3	501.1	346.1	148.0	144.3	139.2	118.4	59.01	26.47	135.4	136.3
Ni	95.70	179.8	131.2	98.62	97.10	90.48	59.01	49.92	42.86	55.66	68.05
∑REE	117	159.0	174.5	83.87	83.96	82.79	108.9	105.6	106.6	120.9	87.11
Eu/Eu*[c]	0.94	0.88	0.87	0.97	0.98	0.97	0.87	0.91	0.91	0.86	0.91
Th/Ta	1.49	2.91	3.07	2.27	2.13	2.33	5.12	5.49	5.47	4.24	5.50
Ti/Y	466	437	415	378	384	388	357	393	441	348	351
Nb/La	0.83	0.91	0.89	0.84	0.85	0.84	0.66	0.67	0.65	0.67	0.64
Nb/Th	12.14	5.15	4.95	6.84	6.97	6.85	2.86	2.86	2.87	2.63	2.81

No a: $Fe_2O_3T = Fe_2O_3 + 1.1FeO$; b: $Mg^{\#} = [100 \times \text{molar Mg}/(\text{Mg} + \text{Fe})]$.

c: Eu/Eu* = (Eu/0.168)/SQRT((Sm/0.444)×(Gd/0.596)). Geochemical data of sample Tg109, P45T1, Tg11, T41, T51 and P904 were previously published by Wang et al., 2014a, b.

Table DR2. (Continued).

Lithology	gabbro samples (QLT)									
Sample	GE702	GE703	GE706	E713	E801	E812	GE802	GE806	GE75	GE77
SiO_2	50.31	46.85	50.73	48.02	47.80	47.37	48.89	50.17	49.89	50.19
TiO_2	1.29	1.93	1.97	1.74	1.06	2.36	1.35	2.11	1.93	2.38
Al_2O_3	15.21	14.96	13.23	14.49	16.82	13.41	15.26	14.84	13.42	13.63
Fe_2O_3T[a]	9.37	12.59	12.89	10.10	9.12	15.10	12.39	10.08	10.68	11.35
$Mg^{\#}$[b]	65.00	52.20	54.90	65.60	68.60	49.20	50.20	59.60	62.90	55.70
MnO	0.14	0.19	0.18	0.15	0.14	0.23	0.21	0.15	0.17	0.17
MgO	7.46	5.90	6.72	8.26	8.54	6.28	5.36	6.38	7.77	6.12
CaO	9.99	11.37	9.45	11.74	11.38	10.92	11.00	9.97	9.36	8.93
Na_2O	2.87	3.06	3.49	2.27	1.99	2.16	2.12	2.27	3.70	2.85
K_2O	1.03	0.53	0.29	0.47	0.27	0.35	0.31	0.89	0.58	0.73
P_2O_5	0.12	0.16	0.18	0.20	0.11	0.17	0.15	0.20	0.18	0.22
LOl	2.18	1.91	0.83	2.43	2.76	1.87	2.23	2.31	1.87	2.88
La	12.20	12.00	10.60	14.70	11.30	12.10	8.75	23.80	17.50	21.60
Ce	29.20	30.00	27.70	34.80	24.90	27.70	19.16	53.50	43.70	52.60
Pr	3.63	3.67	3.75	4.23	2.99	3.68	2.61	6.16	5.40	6.50
Nd	16.60	17.60	18.60	19.40	12.80	17.00	12.38	26.10	24.40	29.70
Sm	4.19	5.03	5.15	4.61	3.14	4.73	3.47	6.14	5.72	7.21
Eu	1.27	1.75	1.77	1.68	1.05	1.75	1.20	1.89	1.77	2.07
Gd	4.14	6.00	5.54	4.54	3.30	5.64	4.43	5.88	5.82	6.97
Tb	0.67	1.07	0.92	0.69	0.58	1.07	0.72	0.99	0.92	1.10
Dy	4.05	7.13	5.95	4.05	3.64	6.61	4.98	5.52	5.44	6.78
Ho	0.81	1.53	1.19	0.76	0.80	1.40	0.97	1.10	1.06	1.29
Er	2.20	4.39	3.43	2.02	2.09	3.78	2.99	3.00	2.78	3.58
Tm	0.31	0.59	0.46	0.27	0.32	0.52	0.41	0.40	0.38	0.47
Yb	1.81	4.09	3.02	1.73	1.94	3.27	2.77	2.49	2.49	3.03
Lu	0.27	0.60	0.45	0.24	0.29	0.49	0.38	0.34	0.35	0.43
Y	22.20	43.80	33.80	21.40	20.30	34.80	25.20	27.80	27.80	36.60
Ba	512.00	170.00	96.00	132.00	143.00	120.00	114.00	274.00	95.00	193.00
Rb	41.00	22.80	8.80	19.90	10.90	18.40	10.65	39.30	27.50	37.10
Sr	306.00	288.00	223.00	391.00	297.00	350.00	233.00	369.00	311.00	364.00
Nb	5.84	8.01	6.39	10.90	7.05	10.90	6.24	16.40	9.63	11.90
Ta	0.40	0.48	0.40	0.67	0.54	0.78	0.43	1.22	0.61	0.77
U	0.63	0.35	0.39	0.47	0.25	0.51	0.44	0.89	0.77	0.88
Th	2.95	1.99	1.99	2.29	1.83	1.97	2.45	4.98	2.99	4.82
Zr	105.00	133.00	154.00	129.00	83.20	130.00	93.00	181.00	178.00	229.00
Hf	2.30	2.86	3.31	2.57	1.98	3.19	2.79	4.35	3.83	4.76
Ti	7732	11568	11808	10430	6354	14146	8092	12647	11568	14266
K	8551	4400	2407	3902	2241	2906	2573	7388	4815	6060
P	489	652	734	815	448	693	611	815	734	897
V	304.00	400.00	465.00	284.00	128.00	508.00	300.00	246.00	381.00	414.00
Cr	661.00	68.00	122.00	423.00	377.00	72.00	77.00	124.00	470.00	210.00
Ni	102.00	32.00	89.00	131.00	157.00	70.00	45.00	26.00	212.00	149.00
∑REE	81.35	95.45	88.53	93.72	69.14	89.74	65.22	137.31	117.73	143.33
Eu/Eu*[c]	0.93	0.98	1.01	1.12	1.00	1.04	0.94	0.96	0.94	0.89
Th/Ta	7.38	4.15	4.98	3.42	3.39	2.53	5.70	4.08	4.90	6.26
Ti/Y	348	264	349	487	313	406	321	455	416	390
Nb/La	0.48	0.67	0.60	0.74	0.62	0.90	0.71	0.69	0.55	0.55
Nb/Th	1.98	4.03	3.21	4.76	3.85	5.53	2.55	3.29	3.22	2.47

No a: $Fe_2O_3T = Fe_2O_3 + 1.1FeO$; b: $Mg^{\#} = [100 \times \text{molar Mg}/(\text{Mg} + \text{Fe})]$.

c: Eu/Eu* = (Eu/0.168)/SQRT((Sm/0.444)×(Gd/0.596)). Geochemical data of sample Tg109, P45T1, Tg11, T41, T51 and P904 were previously published by Wang et al., 2014a, b.

Table DR2. (Continued).

Lithology	gabbro samples (QLT)									
Sample	DYT6H1	DYT6H2	DYT6H3	DYT6H4	DYT6H5	DYT7H1	DYT7H2	DYT7H3	DYT7H4	DYT7H5
SiO_2	48.62	47.41	48.58	49.51	50.46	45.92	46.46	46.55	47.27	47.63
TiO_2	1.46	1.57	1.46	1.47	1.45	1.5	1.47	1.51	1.47	1.42
Al_2O_3	14.31	14.77	14.65	13.62	13.06	15.64	15.63	15.39	15.03	15.07
Fe_2O_3T[a]	11.79	12.25	11.34	11.89	11.56	11.98	11.49	11.5	11.51	11.49
$Mg^{\#}$[b]	57.45	55.41	58.34	59.24	59.24	58.14	58.71	58.72	58.58	58.17
MnO	0.19	0.19	0.19	0.19	0.19	0.22	0.2	0.19	0.2	0.21
MgO	7.96	7.61	7.94	8.64	8.4	8.32	8.17	8.18	8.14	7.99
CaO	11.78	11.54	11.81	10.92	10.77	10.26	10.22	10.32	9.96	10.08
Na_2O	1.76	2.14	1.76	1.67	1.62	3.69	3.47	3.68	3.46	3.6
K_2O	0.52	0.78	0.55	0.46	0.45	0.13	0.37	0.24	0.38	0.1
P_2O_5	0.14	0.17	0.15	0.15	0.15	0.24	0.24	0.24	0.23	0.22
LOl	2	2.17	2.11	1.96	2.29	2.19	2.34	2.27	2.38	2.2
La	9.35	9.75	11.32	9.45	10.47	10.05	10.41	10.48	10.13	10.49
Ce	22.66	23.52	26.92	22.72	25.16	21.84	22.32	22.68	21.9	22.7
Pr	3.21	3.32	3.73	3.21	3.56	2.8	2.85	2.89	2.8	2.87
Nd	14.65	15.06	16.8	14.54	16.19	12	12.16	12.45	11.99	12.14
Sm	4.2	4.22	4.68	4.07	4.55	3.08	3.05	3.16	3.06	3.09
Eu	1.55	1.52	1.7	1.51	1.62	1.07	1.1	1.11	1.05	1.04
Gd	5.19	5.31	5.66	5.06	5.64	3.63	3.6	3.77	3.62	3.58
Tb	0.84	0.84	0.92	0.81	0.91	0.59	0.58	0.61	0.58	0.58
Dy	5.36	5.47	5.86	5.19	5.83	3.9	3.9	4.04	3.83	3.8
Ho	1.11	1.13	1.2	1.08	1.21	0.82	0.82	0.84	0.8	0.79
Er	3.07	3.11	3.31	2.95	3.3	2.26	2.26	2.34	2.24	2.21
Tm	0.41	0.42	0.45	0.4	0.45	0.32	0.32	0.33	0.32	0.31
Yb	2.68	2.72	2.88	2.6	2.91	2.1	2.09	2.15	2.06	2.03
Lu	0.37	0.38	0.4	0.36	0.4	0.31	0.31	0.32	0.31	0.3
Y	26.86	26.86	28.39	25.33	28.3	23.72	24	23.8	23.16	24.24
Ba	157.66	154.46	169.74	159.94	139.1	27.64	76.94	43.66	65.92	18.81
Rb	14.97	19.01	24.72	14.96	13.55	3.72	14.11	8.44	14.73	2.79
Sr	368.5	264	298.2	356.8	320.8	142.16	169.84	120.18	113.8	244.6
Nb	8.66	8.68	10.11	8.38	9.59	10.21	9.95	10.13	10.09	10.16
Ta	0.52	0.58	0.64	0.53	0.63	0.61	0.61	0.62	0.59	0.6
U	0.32	0.34	0.55	0.33	0.32	0.83	0.79	0.87	0.86	0.84
Th	0.99	0.94	1.9	0.92	1.09	2.67	2.59	2.7	2.59	2.58
Zr	91.44	93.73	103.02	89.25	102.1	79.31	76.81	76.04	76.74	78.29
Hf	2.28	2.4	2.64	2.31	2.62	2	1.9	1.96	1.95	1.88
Ti	10429	9965	10754	9565	10741	9276	9128	9118	9134	9658
K	4135	4819	6126	4151	3843	1671	3596	2356	3664	1755
P	662	681	770	673	779	1440	1489	1402	1438	1516
V	318.89	299.91	324.87	294.84	319.02	318.2	307.2	310	303.8	330.4
Cr	230.49	196.43	203.58	225.94	255.06	115.96	107.8	105.86	106.64	116.48
Ni	116.37	108.91	106.58	129.71	188.32	72.18	70.54	70	68.76	77.68
∑REE	74.65	76.77	85.83	73.95	82.20	64.77	65.77	67.17	64.69	65.93
Eu/Eu*[c]	1.02	0.98	1.01	1.02	0.98	0.98	1.02	0.98	0.97	0.96
Th/Ta	1.90	1.62	2.97	1.74	1.73	4.38	4.25	4.35	4.39	4.30
Ti/Y	388	371	379	378	380	391	380	383	394	398
Nb/La	0.93	0.89	0.89	0.89	0.92	1.02	0.96	0.97	1.00	0.97
Nb/Th	8.75	9.23	5.32	9.11	8.80	3.82	3.84	3.75	3.90	3.94

No Geochemical data of sample GE702, GE703, GE706, E713, E801, E812, GE802, GE806, GE75, GE77, GE813 and GE816 were collected from Zhai et al., 2013b; a: $Fe_2O_3T = Fe_2O_3 + 1.1FeO$; b: $Mg^{\#} = [100 \times \text{molar Mg}/(\text{Mg} + \text{Fe})]$. c: Eu/Eu* = (Eu/0.168)/SQRT((Sm/0.444)×(Gd/0.596)).

Table DR2. (Continued).

Lithology	gabbro samples (QLT)										
Sample	GE817	GE818	M701	M702	M703	M903	M904	MG706	GE813	GE816	MG801
SiO_2	47.22	47.61	51.05	47.19	47.45	50.09	49.81	52.11	49.60	51.86	48.88
TiO_2	1.76	1.75	1.39	1.84	1.92	2.73	2.82	1.59	1.25	1.42	1.63
Al_2O_3	15.05	14.98	15.03	11.79	13.68	12.47	12.45	11.03	16.76	14.18	13.55
Fe_2O_3T[a]	11.08	10.98	9.59	10.84	14.13	14.84	15.05	8.51	10.49	10.44	13.57
$Mg^{\#}$[b]	63.50	63.60	62.80	68.60	50.70	46.00	46.90	70.70	57.50	59.50	53.70
MnO	0.16	0.16	0.14	0.16	0.21	0.22	0.22	0.16	0.18	0.17	0.22
MgO	8.27	8.22	6.95	10.16	6.23	5.44	5.72	8.80	6.08	6.57	6.76
CaO	10.03	9.99	9.24	12.73	10.96	8.09	8.63	11.90	9.42	9.96	9.39
Na_2O	2.35	2.36	2.03	1.69	2.40	2.78	2.38	2.49	3.62	1.84	3.74
K_2O	0.38	0.38	0.75	0.71	0.23	0.96	0.75	0.83	0.52	1.00	0.02
P_2O_5	0.20	0.19	0.14	0.18	0.16	0.25	0.29	0.17	0.12	0.17	0.13
LOl	3.03	2.98	3.40	2.20	2.08	1.66	1.76	2.20	1.83	2.28	1.89
La	25.50	16.00	15.90	16.20	9.33	17.05	16.36	20.00	16.00	17.50	8.21
Ce	66.20	37.20	37.00	39.40	24.40	40.60	38.98	45.90	34.20	38.50	20.50
Pr	8.51	4.42	4.46	4.85	3.36	5.77	5.55	5.26	3.92	4.59	2.82
Nd	40.00	20.00	19.00	21.60	16.70	27.74	26.74	23.20	16.20	19.90	13.60
Sm	9.49	4.72	4.64	5.41	4.75	7.13	6.87	5.37	4.40	4.62	4.11
Eu	3.31	1.69	1.35	1.61	1.74	2.30	2.25	1.53	1.40	1.33	1.50
Gd	9.18	4.70	4.56	5.05	5.77	8.06	7.79	5.46	4.87	4.83	5.05
Tb	1.42	0.76	0.74	0.78	0.94	1.17	1.14	0.84	0.91	0.81	0.95
Dy	7.84	4.60	4.36	4.44	6.03	7.53	7.33	5.04	5.53	4.76	6.15
Ho	1.44	0.89	0.91	0.82	1.19	1.36	1.34	0.98	1.24	0.95	1.33
Er	3.83	2.38	2.41	2.25	3.43	3.96	3.89	2.66	3.31	2.50	3.70
Tm	0.49	0.33	0.33	0.29	0.46	0.51	0.50	0.36	0.44	0.35	0.51
Yb	2.89	2.11	2.14	1.84	3.00	3.23	3.26	2.26	2.67	2.12	3.20
Lu	0.40	0.30	0.31	0.27	0.45	0.41	0.41	0.32	0.40	0.30	0.46
Y	38.60	23.50	24.90	24.20	34.00	35.70	35.20	27.40	29.90	24.40	33.40
Ba	204.00	206.00	176.00	272.00	170.00	249.00	153.00	242.00	265.00	200.00	82.10
Rb	27.60	14.40	39.00	36.00	12.30	41.20	30.00	48.90	24.00	47.00	5.50
Sr	536.00	264.00	287.00	570.00	394.00	234.00	239.00	268.00	229.00	280.00	611.00
Nb	23.30	11.10	7.29	12.70	5.51	18.47	18.77	10.90	9.02	9.89	4.89
Ta	1.51	0.70	0.46	0.81	0.35	1.15	1.14	0.79	0.65	0.73	0.36
U	0.47	0.32	0.83	0.50	0.42	0.61	0.60	1.13	0.64	0.72	0.32
Th	2.19	2.05	4.27	2.75	2.01	2.74	2.57	5.14	3.78	4.69	1.78
Zr	294.00	136.00	131.00	140.00	150.00	184.00	178.00	151.00	108.00	135.00	110.00
Hf	6.06	2.91	2.88	2.87	3.17	4.98	4.79	3.40	2.72	3.26	2.84
Ti	10549	10489	8332	11029	11508	16364	16903	9530	7492	8511	9770
K	3155	3155	6226	5894	1909	7969	6226	6890	4317	8301	166
P	815	775	571	734	652	1019	1182	693	489	693	530
V	464.00	259.00	306.00	348.00	466.00	407.00	476.00	341.00	278.00	299.00	419.00
Cr	41.00	270.00	452.00	866.00	205.00	76.00	97.00	998.00	120.00	125.00	97.00
Ni	48.00	126.00	82.60	129.00	79.20	53.64	59.76	65.20	54.00	65.00	79.70
∑REE	180.50	100.10	98.11	104.81	81.55	126.82	122.41	119.18	95.49	103.06	72.09
Eu/Eu*[c]	1.09	1.10	0.90	0.94	1.02	0.93	0.94	0.87	0.93	0.86	1.01
Th/Ta	1.45	2.93	9.28	3.40	5.74	2.38	2.25	6.51	5.82	6.42	4.94
Ti/Y	273	446	335	456	338	458	480	348	251	349	293
Nb/La	0.91	0.69	0.46	0.78	0.59	1.08	1.15	0.55	0.56	0.57	0.60
Nb/Th	10.64	5.41	1.71	4.62	2.74	6.74	7.30	2.12	2.39	2.11	2.75

No: Geochemical data of sample E817, GE818, M701, M702, M703, M903, M904, MG706, and MG801 were collected from Zhai et al., 2013b; a: $Fe_2O_3T = Fe_2O_3 + 1.1FeO$; b: $Mg^{\#} = [100 \times \text{molar Mg}/(Mg + Fe)]$. c: $Eu/Eu^* = (Eu/0.168)/SQRT((Sm/0.444)\times(Gd/0.596))$.

Table DR3. Zircon Hf isotopic data of gabbro samples from southern Qiangtang, Tibet.

Sample	$^{206}Pb/^{238}U$ (Ma)	$^{176}Yb/^{177}Hf$	2σ	$^{176}Lu/^{177}Hf$	2σ	$^{176}Hf/^{177}Hf$	2σ	$\varepsilon_{Hf}(0)$	$\varepsilon_{Hf}(t)$	2σ	T_{DM} (Ma)	T_{DM}^{C}(Ma)	$f_{Lu/Hf}$
DYT6-01	290	0.025897	0.000159	0.000765	0.000012	0.282610	0.000019	-5.7	0.5	0.7	904	1275	-0.98
DYT6-02	290	0.038927	0.000421	0.001162	0.000009	0.282538	0.000014	-8.3	-2.1	0.5	1015	1441	-0.97
DYT6-03	290	0.024185	0.000316	0.000668	0.000009	0.282538	0.000016	-8.3	-2.0	0.6	1002	1435	-0.98
DYT6-04	290	0.028257	0.000311	0.000864	0.000013	0.282542	0.000028	-8.2	-2.0	1.0	1003	1430	-0.97
DYT6-05	290	0.038337	0.000273	0.001214	0.000006	0.282580	0.000022	-6.8	-0.7	0.8	957	1347	-0.96
DYT6-06	290	0.025818	0.000121	0.000729	0.000003	0.282534	0.000013	-8.4	-2.2	0.5	1010	1445	-0.98
DYT6-07	290	0.032966	0.000685	0.000957	0.000021	0.282509	0.000013	-9.3	-3.1	0.5	1050	1503	-0.97
DYT6-08	290	0.028877	0.000439	0.000883	0.000021	0.282548	0.000016	-7.9	-1.7	0.6	994	1415	-0.97
DYT6-09	290	0.030491	0.000435	0.000868	0.000009	0.282526	0.000015	-8.7	-2.5	0.5	1025	1466	-0.97
DYT6-10	290	0.037933	0.000257	0.001100	0.000009	0.282511	0.000015	-9.2	-3.1	0.5	1052	1501	-0.97
DYT6-11	290	0.036465	0.000353	0.001151	0.000016	0.282491	0.000024	-9.9	-3.8	0.8	1081	1546	-0.97
GT4-01	317	0.092317	0.000659	0.002711	0.000018	0.282789	0.000017	0.6	7.0	0.6	688	882	-0.92
GT4-02	317	0.011986	0.000085	0.000385	0.000003	0.282724	0.000013	-1.7	5.2	0.5	737	997	-0.99
GT4-03	317	0.045209	0.000548	0.001374	0.000016	0.282742	0.000016	-1.1	5.6	0.6	731	970	-0.96
GT4-04	317	0.032533	0.000472	0.000979	0.000015	0.282718	0.000016	-1.9	4.9	0.6	757	1018	-0.97
GT4-05	317	0.027756	0.000414	0.000895	0.000014	0.282772	0.000017	0.0	6.8	0.6	679	895	-0.97
GT4-06	317	0.036089	0.000372	0.001115	0.000011	0.282710	0.000017	-2.2	4.5	0.6	771	1038	-0.97
GT4-07	317	0.034962	0.001659	0.001028	0.000042	0.282725	0.000018	-1.7	5.1	0.6	748	1004	-0.97
GT4-08	317	0.029249	0.000392	0.000874	0.000016	0.282738	0.000015	-1.2	5.6	0.5	727	972	-0.97
GT4-09	317	0.029494	0.000969	0.000892	0.000028	0.282698	0.000015	-2.6	4.2	0.5	784	1063	-0.97
GT4-10	317	0.070545	0.000743	0.002030	0.000021	0.282764	0.000014	-0.3	6.3	0.5	711	928	-0.94
GT4-11	317	0.020416	0.000062	0.000619	0.000001	0.282706	0.000012	-2.3	4.5	0.4	767	1042	-0.98
GT4-12	317	0.033491	0.000191	0.001003	0.000006	0.282746	0.000015	-0.9	5.9	0.5	717	955	-0.97
GT4-13	317	0.027855	0.000685	0.000830	0.000020	0.282742	0.000015	-1.0	5.7	0.5	719	961	-0.98
GT4-14	317	0.051555	0.004294	0.001480	0.000117	0.282810	0.000018	1.3	8.0	0.7	636	818	-0.96

Table DR3. (Continued).

Sample	$^{206}Pb/^{238}U$ (Ma)	$^{176}Yb/^{177}Hf$	2σ	$^{176}Lu/^{177}Hf$	2σ	$^{176}Hf/^{177}Hf$	2σ	$\varepsilon_{Hf}(0)$	$\varepsilon_{Hf}(t)$	2σ	T_{DM} (Ma)	T_{DM}^{C}(Ma)	$f_{Lu/Hf}$
GT5-01	306	0.093557	0.000231	0.002122	0.000002	0.282921	0.000015	5.3	11.6	0.5	484	581	-0.94
GT5-02	306	0.071713	0.001349	0.001830	0.000024	0.282943	0.000018	6.1	12.4	0.6	448	527	-0.94
GT5-03	306	0.076576	0.001236	0.001850	0.000024	0.282990	0.000016	7.7	14.0	0.6	381	422	-0.94
GT5-04	306	0.083348	0.001073	0.001955	0.000042	0.282958	0.000017	6.6	12.9	0.6	428	496	-0.94
GT5-05	306	0.075248	0.001769	0.001877	0.000050	0.282944	0.000017	6.1	12.4	0.6	448	526	-0.94
GT5-06	306	0.142181	0.000877	0.003651	0.000047	0.283049	0.000028	9.8	15.8	1.0	310	311	-0.89
GT6-01	286	0.045136	0.000508	0.000785	0.000009	0.282931	0.000019	5.6	11.8	0.7	453	554	-0.98
GT6-02	286	0.041682	0.000416	0.000781	0.000009	0.282898	0.000018	4.5	10.6	0.6	499	628	-0.98
GT6-03	286	0.042583	0.000258	0.000783	0.000010	0.282945	0.000022	6.1	12.2	0.8	434	523	-0.98
GT6-04	286	0.046317	0.000787	0.001052	0.000021	0.282815	0.000021	1.5	7.6	0.7	621	819	-0.97
GT6-05	286	0.093546	0.000963	0.002146	0.000043	0.282897	0.000038	4.4	10.3	1.3	520	647	-0.94
GT11-01	291	0.122166	0.001411	0.003204	0.000042	0.282902	0.000026	4.6	10.4	0.9	528	647	-0.90
GT11-02	291	0.124561	0.004477	0.003363	0.000123	0.282822	0.000023	1.8	7.5	0.8	651	829	-0.90

Table DR4. Sr–Nd isotopic data of mafic dykes from southern Qiangtang, Tibet.

Sample	Age(Ma)	Rb(ppm)	Sr(ppm)	$^{87}Rb/^{86}Sr$	$^{87}Sr/^{86}Sr$	±2σ	Isr	Sm(ppm)	Nd(ppm)	$^{147}Sm/^{144}Nd$	$^{143}Nd/^{144}Nd$	±2σ	εNd(0)	εNd(T)
mafic dykes samples(QLT), collected from Zhai et al., 2013b														
M701	283	19.82	364.20	0.1574	0.7056	15	0.7049	15.260	66.560	0.1387	0.5128	7	3.60	5.60
M702	283	0.59	422.70	0.0040	0.7073	15	0.7073	7.310	30.300	0.1458	0.5129	5	5.20	7.00
M902	283	27.61	196.70	0.4061	0.7068	17	0.7052	5.680	22.110	0.1553	0.5128	5	3.60	5.10
M907	283	17.14	296.80	0.1670	0.7052	18	0.7045	5.580	23.390	0.1441	0.5128	5	3.70	5.60
E812	283	8.90	228.50	0.1128	0.7101	16	0.7097	4.150	14.730	0.1705	0.5129	8	4.60	5.60
GE813	283	8.22	257.70	0.0923	0.7053	18	0.7049	5.150	19.850	0.1569	0.5130	9	6.20	7.60
GE816	283	6.55	299.70	0.0632	0.7040	15	0.7038	5.110	20.480	0.1508	0.5128	8	3.60	5.20
GE817	283	19.29	423.70	0.1317	0.7057	12	0.7052	8.600	34.940	0.1489	0.5129	15	5.30	7.10
mafic dykes samples(QHT), collected from Xu et al., 2015														
L26-H1	290	8.24	346.00	0.0689	0.7133	5	0.7131	10.200	46.500	0.1325	0.5127	9		2.87
L26-H2	290	8.61	450.00	0.0553	0.7137	5	0.7131	9.100	41.100	0.1338	0.5126	9		2.29
L26-H3	290	2.25	346.00	0.0188	0.7137	4	0.7131	9.360	43.400	0.1303	0.5127	9		3.53
L26-H4	290	16.40	593.00	0.0800	0.7136	4	0.7131	8.540	39.600	0.1303	0.5127	7		3.53
L26-H5	290	11.00	580.00	0.0548	0.7138	5	0.7131	9.730	44.600	0.1318	0.5127	6		3.13