

**Table S1.** LA-SF-ICP-MS U–Pb isotopic data on single zircon grains of studied massifs rocks in the Ozeranya zone, western Mongolia

Analytical point	Isotopic rations				Rho	Age, Ma				D, %
	$^{207}\text{Pb}/^{235}\text{U}$	$\pm 1\sigma$	$^{206}\text{Pb}/^{238}\text{U}$	$\pm 1\sigma$		$^{207}\text{Pb}/^{235}\text{U}$	$\pm 1\sigma$	$^{206}\text{Pb}/^{238}\text{U}$	$\pm 1\sigma$	
Tavan-Hayrhan massif										
Gabbroid association, leucogabbro, sample PM-35/1-07										
3	0.73694	0.01166	0.09093	0.00082	0.57	560.6	6.8	561	4.8	-0.1
4	0.73764	0.01626	0.0911	0.00086	0.43	561	9.5	562.1	5.1	-0.2
5	0.73106	0.01498	0.09016	0.00085	0.46	557.2	8.8	556.5	5.0	0.1
6	0.7332	0.01364	0.0907	0.00084	0.50	558.4	8.0	559.7	4.9	-0.2
8	0.73078	0.01284	0.09039	0.00083	0.52	557	7.5	557.8	4.9	-0.1
10	0.73447	0.01655	0.09026	0.00087	0.43	559.2	9.7	557.1	5.1	0.4
11	0.73285	0.01276	0.09053	0.00083	0.53	558.2	7.5	558.7	4.9	-0.1
13	0.73276	0.01562	0.09052	0.00086	0.43	558.2	9.1	558.6	5.1	-0.1
14	0.73419	0.01287	0.09071	0.00083	0.52	559	7.5	559.7	4.9	-0.1
16	0.73188	0.02057	0.09014	0.00092	0.36	557.7	12.1	556.4	5.4	0.2
17	0.73346	0.01531	0.09042	0.00085	0.45	558.6	9.0	558	5.0	0.1
19	0.73738	0.01977	0.09073	0.00091	0.37	560.9	11.6	559.9	5.4	0.2
20	0.73499	0.01343	0.09053	0.00084	0.51	559.5	7.9	558.7	4.9	0.1
23	0.73495	0.01602	0.09084	0.00087	0.44	559.5	9.4	560.5	5.1	-0.2
26	0.73426	0.0142	0.09059	0.00085	0.49	559.1	8.3	559	5.0	0.0
28	0.73572	0.01968	0.09072	0.00091	0.37	559.9	11.5	559.8	5.4	0.0
32	0.73575	0.01305	0.09065	0.00084	0.52	559.9	7.6	559.4	5.0	0.1
33	0.73673	0.01309	0.09042	0.00084	0.52	560.5	7.6	558	4.9	0.4
36	0.7406	0.01574	0.09076	0.00087	0.45	562.8	9.2	560	5.1	0.5
37	0.73208	0.02027	0.09054	0.00092	0.37	557.8	11.9	558.8	5.5	-0.2
39	0.73328	0.01491	0.09046	0.00086	0.47	558.5	8.7	558.3	5.1	0.0
44	0.73375	0.01806	0.09061	0.0009	0.40	558.8	10.6	559.2	5.3	-0.1
46	0.72712	0.02465	0.08981	0.00098	0.32	554.9	14.5	554.4	5.8	0.1
47	0.73077	0.02141	0.09022	0.00094	0.36	557	12.6	556.9	5.6	0.0
2*	0.77571	0.01244	0.09467	0.00085	0.56	583	7.1	583.1	5.0	0.0
18*	0.77372	0.01919	0.09418	0.00093	0.40	581.9	11.0	580.2	5.5	0.3
22*	0.76709	0.02105	0.09368	0.00095	0.37	578.1	12.1	577.3	5.6	0.1
29*	0.7676	0.01697	0.09381	0.0009	0.43	578.4	9.7	578	5.3	0.1
East Bayan Tsagaan massif										
Plagiogranitoids association, plagiogranite, sample PM-10-47										
1	0.72288	0.0199	0.08928	0.00088	0.36	552.4	11.7	551.3	5.2	0.2
3	0.72527	0.01042	0.0894	0.00078	0.61	553.8	6.1	552	4.6	0.3
4	0.7267	0.01817	0.08978	0.00086	0.38	554.6	10.7	554.3	5.1	0.1
7	0.72463	0.01271	0.09003	0.0008	0.51	553.4	7.5	555.7	4.7	-0.4
8	0.7261	0.00983	0.08964	0.00077	0.63	554.3	5.8	553.4	4.6	0.2
11	0.7378	0.00839	0.09069	0.00077	0.75	561.1	4.9	559.6	4.6	0.3
15	0.72793	0.01589	0.08981	0.00083	0.42	555.3	9.3	554.4	4.9	0.2
17	0.72397	0.00843	0.08997	0.00077	0.73	553	5.0	555.3	4.5	-0.4
25	0.72807	0.00983	0.08976	0.00078	0.64	555.4	5.8	554.1	4.6	0.2
27	0.72568	0.01353	0.08972	0.00081	0.48	554	8.0	553.9	4.8	0.0
29	0.73158	0.00872	0.08972	0.00077	0.72	557.5	5.1	553.9	4.5	0.6
30	0.73281	0.00921	0.09002	0.00077	0.68	558.2	5.4	555.6	4.6	0.5
31	0.72683	0.01667	0.08971	0.00084	0.41	554.7	9.8	553.8	5.0	0.2
33	0.73209	0.0095	0.09002	0.00078	0.67	557.8	5.6	555.7	4.6	0.4
39	0.73224	0.01005	0.08995	0.00078	0.63	557.9	5.9	555.3	4.6	0.5
46	0.72472	0.01031	0.08953	0.00078	0.61	553.5	6.1	552.8	4.6	0.1
48	0.73279	0.01138	0.08991	0.00079	0.57	558.2	6.7	555	4.7	0.6
49	0.72733	0.03637	0.09001	0.00118	0.26	555	21.4	555.6	7.0	-0.1
50	0.73408	0.0239	0.09057	0.00095	0.32	558.9	14.0	558.9	5.6	0.0

**Table S1 (Contd.).**

Analytical point	Isotopic ratios				Rho	Age, Ma				D, %
	$^{207}\text{Pb}/^{235}\text{U}$	$\pm 1\sigma$	$^{206}\text{Pb}/^{238}\text{U}$	$\pm 1\sigma$		$^{207}\text{Pb}/^{235}\text{U}$	$\pm 1\sigma$	$^{206}\text{Pb}/^{238}\text{U}$	$\pm 1\sigma$	
18*	0.76587	0.01297	0.09347	0.00083	0.52	577.4	7.5	576	4.9	0.2
19*	0.76132	0.01301	0.09307	0.00083	0.52	574.8	7.5	573.7	4.9	0.2
20*	0.76487	0.01501	0.09337	0.00085	0.46	576.8	8.6	575.4	5.0	0.2
21*	0.76069	0.02557	0.0933	0.00099	0.32	574.4	14.7	575	5.8	-0.1
22*	0.75752	0.02172	0.09308	0.00093	0.35	572.6	12.5	573.7	5.5	-0.2
24*	0.75932	0.01292	0.09329	0.00083	0.52	573.6	7.5	575	4.9	-0.2
36*	0.75733	0.00958	0.09259	0.0008	0.68	572.5	5.5	570.9	4.7	0.3
4*	0.75818	0.01644	0.09279	0.00087	0.43	573	9.5	572	5.1	0.2
43*	0.76566	0.03207	0.09358	0.0011	0.28	577.3	18.4	576.7	6.5	0.1
40*	0.83217	0.01669	0.09983	0.00091	0.45	614.8	9.3	613.4	5.3	0.2
47*	0.86899	0.01806	0.09537	0.00092	0.45	635	9.8	610.6	5.4	4.0
28*	0.88558	0.01624	0.10477	0.00094	0.49	644	8.7	642.3	5.5	0.3
35*	0.91374	0.01989	0.10744	0.00099	0.42	659	10.5	657.8	5.8	0.2
<b>Tungalag massif</b>										
Plagiogranitoids association (early), leucoplagiogranite, sample PM-7-16										
6	0.71698	0.01303	0.08817	0.00137	0.85	548.9	7.7	544.7	8.1	0.8
13	0.72455	0.01607	0.08833	0.00144	0.74	553.3	9.5	545.7	8.5	1.4
17	0.71314	0.01452	0.08866	0.00144	0.80	546.6	8.6	547.6	8.5	-0.2
23	0.72160	0.01390	0.08788	0.00139	0.82	551.4	8.2	543	8.5	1.6
5*	0.76901	0.01501	0.09239	0.00148	0.82	579.2	8.6	569.7	8.7	1.7
8*	0.75267	0.01537	0.09202	0.00148	0.79	569.8	8.9	567.5	8.7	0.4
19*	0.73613	0.01529	0.09094	0.00148	0.78	560.1	8.9	561.1	8.7	-0.2
Plagiogranitoids association (late), leucoplagiogranite, sample PM-8-15										
9	0.68670	0.01256	0.08618	0.00139	0.88	530.8	7.6	532.9	8.2	-0.4
4*	0.75991	0.01454	0.09164	0.00148	0.84	574	8.4	565.2	8.7	1.6
<b>Ih-Zamin massif</b>										
Granite-leucogranite association, granite, sample PM-13A-16										
3	0.59508	0.02353	0.07603	0.00113	0.38	471.1	15.0	472.4	6.7	0.4
26	0.60051	0.01664	0.07693	0.00107	0.50	477.6	10.6	477.8	6.4	-0.04
27	0.61259	0.01579	0.07796	0.00108	0.54	485.2	9.9	484	6.5	0.3
29	0.61324	0.01317	0.07791	0.00106	0.63	485.6	8.3	483.6	6.3	0.4
38	0.59813	0.01613	0.07671	0.00107	0.52	476	10.3	476.5	6.4	-0.1
39	0.61133	0.01815	0.07766	0.00110	0.48	484.4	11.4	482.2	6.6	0.5
2*	0.69302	0.02011	0.08583	0.00119	0.48	534.6	12.1	530.8	7.1	0.7
12*	0.69647	0.01441	0.08673	0.00116	0.65	536.7	8.6	536.2	6.9	0.1
31*	0.67942	0.02177	0.08514	0.00122	0.45	526.4	13.2	526.7	7.2	-0.1
36*	0.68501	0.01743	0.08551	0.00119	0.55	529.8	10.5	528.9	7.0	0.2
<b>Shutkhuin massif</b>										
Diorite association, diorite, sample PM-81-18										
3	0.70558	0.01778	0.08795	0.00145	0.65	542.1	10.59	543.4	8.6	-0.2
4	0.70955	0.01591	0.08736	0.00143	0.73	544.5	9.45	539.9	8.45	0.9
5	0.71007	0.01567	0.08837	0.00144	0.74	544.8	9.3	545.9	8.5	-0.2
6	0.71109	0.01612	0.08754	0.00143	0.72	545.4	9.6	541	8.5	0.8
7	0.69035	0.01841	0.08626	0.00143	0.62	533	11.1	533.4	8.5	-0.1
9	0.69471	0.01663	0.08688	0.00142	0.68	535.6	10.0	537.1	8.4	-0.3
10	0.70824	0.01826	0.08826	0.00146	0.64	543.7	10.9	545.2	8.6	-0.3
11	0.71041	0.01949	0.08753	0.00145	0.60	545	11.6	540.9	8.6	0.8
12	0.70319	0.01581	0.08804	0.00143	0.72	540.7	9.4	544	8.5	-0.6
13	0.7068	0.01615	0.08834	0.00144	0.71	542.8	9.6	545.7	8.5	-0.5
14	0.70375	0.01408	0.08791	0.00142	0.91	541	8.4	543.2	8.4	-0.4
16	0.70651	0.01853	0.08793	0.00145	0.63	542.3	11.0	543.3	8.6	-0.1
17	0.7019	0.01867	0.08721	0.00144	0.62	539.9	11.1	539	8.5	0.2
18	0.70977	0.01717	0.08767	0.00143	0.67	544.6	10.2	541.7	8.5	0.5

**Table S1** (Contd.).

Analytical point	Isotopic ratios				Rho	Age, Ma				D, %
	$^{207}\text{Pb}/^{235}\text{U}$	$\pm 1\sigma$	$^{206}\text{Pb}/^{238}\text{U}$	$\pm 1\sigma$		$^{207}\text{Pb}/^{235}\text{U}$	$\pm 1\sigma$	$^{206}\text{Pb}/^{238}\text{U}$	$\pm 1\sigma$	
21	0.70637	0.01563	0.08726	0.00141	0.73	542.6	9.3	539.3	8.4	0.6
24	0.71141	0.01676	0.08882	0.00145	0.69	545.6	9.9	548.6	8.6	-0.5
25	0.70834	0.0137	0.08869	0.00142	0.83	543.8	8.1	547.8	8.4	-0.7
26	0.70599	0.0168	0.08759	0.00142	0.68	542.4	10.0	541.3	8.4	0.2
28	0.70284	0.0184	0.08721	0.00143	0.63	540.5	10.9	539	8.5	0.3
29	0.71014	0.0184	0.08733	0.00143	0.63	544.8	10.9	539.7	8.5	0.9
33	0.71449	0.0167	0.08826	0.00143	0.70	547.4	9.9	545.2	8.5	0.4
38	0.7105	0.0166	0.08744	0.00141	0.69	545	9.9	540.4	8.4	0.9
44	0.70596	0.01996	0.08847	0.00146	0.58	542.3	11.9	546.5	8.6	-0.8
15*	0.74458	0.01472	0.09168	0.00148	0.82	565.1	8.6	565.4	8.7	-0.1
22*	0.76198	0.01947	0.09361	0.00153	0.64	575.2	11.2	576.9	9.0	-0.3
31*	0.75348	0.02208	0.09163	0.00152	0.57	570.2	12.8	565.2	9.0	0.9
32*	0.75344	0.02002	0.09098	0.00149	0.62	570.2	11.6	561.3	8.8	1.6
37*	0.76256	0.01674	0.09081	0.00146	0.73	575.5	9.6	560.3	8.6	2.7
42*	0.75485	0.02304	0.09072	0.00151	0.55	571	13.3	559.8	9.0	2.0
36*	0.99615	0.02870	0.093	0.00154	0.57	701.9	14.6	573.3	9.1	22.4

Note: Corrections for common Pb were introduced according to measured  $^{204}\text{Pb}$ . \* – xenogenic zircon.