

B Supplementary data. Summary of analytical results by U-Pb LAM-MC-ICP-MS zircons data.

SAMPLE TOR-03-MT47 - Loncopué (38°07'15.52" S - 70°34'36.22" W)

Spot number	f(206)%	Th/U	6/4 ratio	7/6 ratio	1s(%)	7/5 ratio	1s(%)	6/8 ratio	1s(%)	Rho	7/6 age	1s(abs)	7/5 age	1s(abs)	6/8 age	1s(abs)	Conc (%)
03_MT47.dat	0.07	0.20	24271	0.05441	0.9	0.4224	1.4	0.05631	1.0	0.74	388.0	2.1	357.8	4.2	353.2	3.6	91.0
04_MT47.dat	0.15	0.29	15978	0.04887	2.1	0.1869	2.6	0.02773	1.5	0.58	141.7	4.9	173.9	4.1	176.3	2.6	124.4
05_MT47.dat	0.53	0.99	3479	0.05433	2.9	0.2293	3.2	0.03061	1.2	0.37	384.9	6.6	209.6	6.0	194.4	2.3	50.5
06_MT47.dat	0.14	1.26	13466	0.04967	1.2	0.2080	1.5	0.03037	1.0	0.80	179.8	2.7	191.9	2.7	192.9	1.8	107.3
09_MT47.dat	0.08	0.76	22102	0.05010	0.9	0.2462	1.3	0.03564	1.0	0.73	199.5	2.0	223.5	2.7	225.8	2.2	113.1
10_MT47.dat	0.13	1.18	15982	0.04990	1.3	0.2059	1.8	0.02993	1.2	0.65	190.3	3.0	190.1	3.0	190.1	2.2	99.9
12_MT47.dat	0.12	1.11	14737	0.05167	1.8	0.2138	2.1	0.03001	0.9	0.68	270.9	4.2	196.8	3.7	190.6	1.8	70.4
17_MT47.dat	0.13	0.43	14248	0.05011	1.1	0.1914	1.9	0.02771	1.5	0.80	200.3	2.6	177.9	3.1	176.2	2.6	88.0
18_MT47.dat	0.02	0.96	128618	0.04992	0.6	0.1567	1.1	0.02278	0.9	0.79	191.1	1.5	147.9	1.5	145.2	1.3	76.0
20_MT47.dat	0.16	0.28	11502	0.06103	5.4	0.3766	5.6	0.04476	1.1	0.36	640.4	11.7	324.6	15.4	282.3	3.0	44.1
23_MT47.dat	0.31	1.56	5958	0.05154	1.6	0.2145	1.8	0.03019	0.9	0.48	265.1	3.6	197.4	3.2	191.7	1.7	72.3
24_MT47.dat	0.08	0.67	38612	0.05084	1.2	0.3117	1.8	0.04447	1.3	0.72	233.7	2.8	275.5	4.2	280.5	3.5	120.0
25_MT47.dat	0.06	0.65	31089	0.05345	0.9	0.1878	1.2	0.02548	0.8	0.67	347.9	1.9	174.8	1.9	162.2	1.3	46.6
26_MT47.dat	0.21	0.35	8634	0.05267	2.9	0.3413	3.2	0.04700	1.3	0.66	314.8	6.6	298.2	8.2	296.1	3.8	94.1
29_MT47.dat	0.05	0.41	39142	0.05145	0.7	0.2980	1.1	0.04201	0.8	0.73	260.9	1.6	264.8	2.5	265.3	2.1	101.7
30_MT47.dat	0.03	0.27	96528	0.05600	1.4	0.8649	3.4	0.11202	3.1	0.91	452.2	3.1	632.8	15.8	684.5	19.9	151.4
31_MT47.dat	0.11	0.49	16068	0.05106	1.5	0.1767	1.6	0.02509	0.7	0.41	243.5	3.4	165.2	2.5	159.8	1.2	65.6
35_MT47.dat	0.09	0.16	19887	0.05459	2.4	0.2820	3.0	0.03747	1.8	0.60	395.3	5.4	252.2	6.7	237.1	4.2	60.0
37_MT47.dat	0.39	0.45	4702	0.05640	1.4	0.2666	2.2	0.03429	1.7	0.76	468.1	3.2	240.0	4.8	217.3	3.6	46.4
38_MT47.dat	0.15	0.27	12562	0.05264	4.9	0.2017	6.0	0.02779	3.5	0.82	313.5	11.0	186.6	10.2	176.7	6.1	56.4
41_MT47.dat	0.03	0.04	61433	0.05875	1.0	0.5804	2.5	0.07164	2.2	0.91	557.9	2.3	464.7	9.2	446.0	9.6	79.9
42_MT47.dat	0.08	0.79	20426	0.05044	1.1	0.2296	2.4	0.03302	2.2	0.88	215.2	2.6	209.9	4.6	209.4	4.4	97.3
43_MT47.dat	0.19	0.37	9427	0.05393	1.2	0.3740	2.0	0.05029	1.6	0.80	368.2	2.6	322.6	5.4	316.3	4.8	85.9
44_MT47.dat	0.04	0.45	41879	0.04923	1.1	0.1719	1.8	0.02532	1.4	0.90	158.9	2.6	161.0	2.7	161.2	2.3	101.4
47_MT47.dat	0.06	0.52	33222	0.05031	0.7	0.2022	1.3	0.02915	1.1	0.86	209.2	1.5	187.0	2.3	185.2	2.1	88.5
48_MT47.dat	0.07	0.55	36596	0.04798	2.1	0.1545	2.4	0.02335	1.2	0.46	98.2	5.1	145.9	3.3	148.8	1.7	151.6
50_MT47.dat	0.05	0.23	39202	0.04933	1.9	0.1705	2.4	0.02507	1.6	0.84	163.7	4.3	159.9	3.6	159.6	2.5	97.5
56_MT47.dat	0.05	0.28	36519	0.05046	0.7	0.2008	1.2	0.02886	1.0	0.80	216.1	1.6	185.8	2.0	183.4	1.8	84.9
57_MT47.dat	0.07	0.66	24724	0.04979	0.7	0.1956	1.1	0.02850	0.9	0.79	185.1	1.5	181.4	1.9	181.2	1.6	97.9

58_MT47.dat	0.08	0.83	24221	0.05306	1.2	0.2508	1.7	0.03429	1.2	0.87	331.3	2.8	227.3	3.5	217.3	2.6	65.6
61_MT47.dat	0.08	0.35	24204	0.04947	1.0	0.1769	1.6	0.02594	1.3	0.78	170.0	2.3	165.4	2.5	165.1	2.1	97.1
62_MT47.dat	0.08	0.32	36602	0.05051	1.0	0.1681	1.4	0.02414	0.9	0.62	218.5	2.4	157.8	2.0	153.8	1.3	70.4
63_MT47.dat	0.19	0.77	9518	0.04905	2.2	0.2213	2.4	0.03272	0.9	0.35	150.2	5.1	203.0	4.4	207.6	1.8	138.2
64_MT47.dat	0.90	0.44	2043	0.05685	7.2	0.2163	7.6	0.02760	2.4	0.55	485.8	15.8	198.9	13.7	175.5	4.2	36.1
68_MT47.dat	0.14	0.30	16790	0.05194	1.7	0.1900	2.0	0.02653	1.0	0.51	282.6	3.8	176.6	3.2	168.8	1.7	59.7
69_MT47.dat	0.03	0.31	50917	0.06662	0.7	1.1771	1.5	0.12815	1.3	0.87	825.8	1.5	790.0	8.2	777.3	9.6	94.1

Rejected analysis

11_MT47.dat	0.23	0.71	7993	0.04491	2.2	0.1459	2.5	0.02356	1.1	0.43	-60.7	5.5	138.3	3.2	150.1	1.6	-247.3
19_MT47.dat	0.15	0.38	12661	0.04448	2.9	0.1487	3.0	0.02424	0.9	0.28	-83.9	7.0	140.7	3.9	154.4	1.4	-184.0
32_MT47.dat	0.14	0.43	13497	0.03856	9.3	0.1319	9.4	0.02481	1.3	0.27	-446.7	24.5	125.8	11.1	158.0	2.1	-35.4
36_MT47.dat	0.21	0.35	16568	0.04335	5.5	0.2626	6.0	0.04394	2.4	0.39	-147.4	13.7	236.8	12.7	277.2	6.5	-188.1
49_MT47.dat	0.23	0.37	7717	0.04730	5.3	0.5572	6.0	0.08543	2.7	0.45	64.5	12.7	449.7	21.7	528.5	13.7	819.3
55_MT47.dat	0.04	0.32	43091	0.04920	1.0	0.3009	1.4	0.04435	1.0	0.71	157.6	2.3	267.1	3.4	279.7	2.8	177.5
67_MT47.dat	0.11	0.49	15946	0.04831	2.0	0.3447	2.6	0.05176	1.5	0.60	114.2	4.8	300.7	6.7	325.3	4.9	284.7
70_MT47.dat	0.07	0.35	25262	0.04664	4.3	0.1472	4.5	0.02289	1.4	0.53	31.0	10.2	139.5	5.8	145.9	2.0	470.9

SAMPLE TOR-05-MT46 - Río Neuquén (37°22'41.29"S - 70°27'29.90"W)

Spot number	f(206)%	Th/U	6/4 ratio	7/6 ratio	1s(%)	7/5 ratio	1s(%)	6/8 ratio	1s(%)	Rho	7/6 age	1s(abs)	7/5 age	1s(abs)	6/8 age	1s(abs)	Conc (%)
03_MT46	0.08	0.73	24222	0.04853	1.1	0.1575	1.5	0.02353	1.0	0.65	125.2	2.6	148.5	2.0	150.0	1.4	119.7
04_MT46	0.27	0.54	6131	0.04907	2.2	0.1545	2.5	0.02283	1.2	0.47	151.2	5.1	145.9	3.4	145.5	1.7	96.3
05_MT46	0.16	0.43	11737	0.04849	2.3	0.1553	2.4	0.02322	0.9	0.36	123.5	5.3	146.5	3.3	148.0	1.4	119.8
06_MT46	0.06	0.81	29858	0.05029	1.4	0.1893	1.6	0.02729	0.8	0.69	208.5	3.3	176.0	2.7	173.6	1.4	83.3
09_MT46	0.05	0.57	37693	0.04900	0.7	0.1535	1.0	0.02272	0.7	0.66	148.0	1.8	145.0	1.4	144.9	1.1	97.8
10_MT46	0.03	0.83	75800	0.04945	0.8	0.1637	1.0	0.02402	0.6	0.59	169.0	1.8	154.0	1.5	153.0	1.0	90.5
12_MT46	0.04	0.55	41254	0.04965	1.6	0.1549	1.7	0.02263	0.7	0.62	178.7	3.6	146.3	2.3	144.3	1.1	80.7
15_MT46	0.02	0.65	80727	0.04900	0.6	0.1547	1.2	0.02290	1.0	0.85	147.8	1.4	146.1	1.6	146.0	1.5	98.7
17_MT46	0.10	0.59	18459	0.04955	0.9	0.1551	1.3	0.02270	0.9	0.66	173.8	2.1	146.4	1.7	144.7	1.2	83.2
18_MT46	0.05	0.63	34581	0.04944	1.6	0.1472	1.9	0.02159	1.0	0.74	168.5	3.8	139.4	2.5	137.7	1.4	81.7
21_MT46	0.03	0.91	56146	0.04980	0.7	0.1838	1.1	0.02677	0.9	0.77	185.8	1.5	171.3	1.7	170.3	1.4	91.7
23_MT46	0.07	0.44	24986	0.04828	0.7	0.1493	1.2	0.02243	0.9	0.79	112.9	1.6	141.3	1.5	143.0	1.3	126.6
24_MT46	0.20	0.46	9259	0.05209	2.8	0.1865	3.0	0.02596	1.1	0.60	289.5	6.4	173.6	4.8	165.2	1.8	57.1
29_MT46	0.11	0.59	17034	0.05176	1.0	0.2398	1.4	0.03360	0.9	0.62	274.9	2.4	218.3	2.7	213.0	1.8	77.5

30_MT46	0.06	0.48	36882	0.04894	0.8	0.1525	1.4	0.02261	1.1	0.77	144.8	2.0	144.1	1.8	144.1	1.5	99.5
31_MT46	0.02	0.58	122326	0.04886	0.5	0.1506	1.2	0.02236	1.1	0.90	141.0	1.2	142.5	1.6	142.5	1.6	101.1
32_MT46	0.11	0.26	16649	0.04941	2.1	0.1568	2.4	0.02302	1.1	0.71	167.1	4.8	147.9	3.3	146.7	1.7	87.8
41_MT46	0.15	0.33	12064	0.05012	1.7	0.1665	1.8	0.02409	0.6	0.30	200.7	4.0	156.4	2.6	153.5	0.9	76.4
42_MT46	0.10	0.38	19904	0.05012	0.9	0.1681	1.2	0.02432	0.7	0.57	200.7	2.1	157.8	1.7	154.9	1.1	77.2
43_MT46	0.10	0.29	18764	0.04945	1.1	0.1529	1.5	0.02243	1.0	0.66	169.2	2.5	144.5	2.0	143.0	1.4	84.5
44_MT46	0.03	0.34	56515	0.04969	2.5	0.1554	2.7	0.02269	1.1	0.63	180.3	5.8	146.7	3.7	144.6	1.6	80.2
47_MT46	0.10	0.46	18438	0.05170	1.2	0.1659	1.8	0.02327	1.3	0.74	272.2	2.7	155.9	2.6	148.3	2.0	54.5
48_MT46	0.08	0.42	23651	0.04866	0.9	0.1488	1.5	0.02218	1.2	0.79	131.5	2.1	140.9	1.9	141.4	1.7	107.5
49_MT46	0.10	0.46	18981	0.05010	0.9	0.1511	1.2	0.02187	0.8	0.63	199.8	2.0	142.9	1.6	139.5	1.1	69.8
50_MT46	0.07	0.55	26789	0.04918	1.6	0.1490	2.0	0.02197	1.1	0.77	156.5	3.8	141.0	2.6	140.1	1.5	89.5
56_MT46	0.05	0.71	37152	0.04936	1.4	0.1549	1.7	0.02276	0.9	0.75	164.9	3.2	146.2	2.3	145.1	1.3	88.0
59_MT46	0.08	0.41	21797	0.05024	0.9	0.1495	1.1	0.02158	0.7	0.55	206.0	2.1	141.5	1.5	137.6	0.9	66.8
60_MT46	0.10	0.56	18446	0.05103	0.9	0.1594	1.2	0.02266	0.8	0.65	242.1	2.1	150.2	1.7	144.4	1.2	59.6
61_MT46	0.06	0.64	33017	0.04955	0.7	0.1699	1.1	0.02487	0.9	0.75	173.9	1.7	159.3	1.6	158.3	1.3	91.1
62_MT46	0.11	0.40	16825	0.04864	2.6	0.1484	2.7	0.02213	0.7	0.44	130.5	6.2	140.5	3.6	141.1	1.0	108.2

Rejected analysis

11_MT46	0.10	0.41	18726	0.04541	2.5	0.1667	2.7	0.02663	0.9	0.30	-33.4	6.1	156.6	3.9	169.4	1.4	-507.2
16_MT46	0.40	0.36	6035	0.04691	2.3	0.1469	2.6	0.02271	1.1	0.40	44.7	5.5	139.2	3.3	144.8	1.5	323.6
22_MT46	0.05	0.85	69616	0.04281	3.1	0.1482	3.5	0.02511	1.8	0.49	-178.6	7.6	140.4	4.6	159.9	2.8	-89.5
53_MT46	1.67	0.31	1103	0.07885	3.1	0.2978	3.4	0.02739	1.2	0.34	1168.3	6.2	264.7	7.8	174.2	2.0	14.9
54_MT46	0.26	0.60	7341	0.04278	3.7	0.1384	3.8	0.02347	0.9	0.23	-180.5	9.2	131.6	4.7	149.5	1.4	-82.9
55_MT46	19.10	0.44	96	0.32381	2.6	1.6583	3.2	0.03714	1.8	0.56	3588.0	4.0	992.7	20.2	235.1	4.1	6.6

SAMPLE TOR-06-MT45 - Puerta Curaco (37°17'58.12"S - 69°53'24.27"W)

Spot number	f(206)%	Th/U	6/4 ratio	7/6 ratio	1s(%)	7/5 ratio	1s(%)	6/8 ratio	1s(%)	Rho	7/6 age	1s(abs)	7/5 age	1s(abs)	6/8 age	1s(abs)	Conc (%)
03_MT45_01	0.34	0.3	5414	0.05165	0.9	0.306	1.3	0.04297	0.9	0.68	270.1	2.1	271.1	3.1	271.2	2.4	100.4
04_MT45_02	15.01	0.41	80	0.05098	2.1	0.1802	2.4	0.02564	1.2	0.47	239.9	4.8	168.2	3.7	163.2	1.9	68.0
05_MT45_03	2.64	0.44	698	0.05211	2	0.2017	2.8	0.02807	1.9	0.68	290.3	4.6	186.6	4.7	178.5	3.3	61.5
11_MT45_05	0.08	0.15	24069	0.04832	1	0.1606	1.4	0.02411	1	0.71	114.9	2.3	151.3	2	153.6	1.6	133.7
12_MT45_07	0.56	0.31	5065	0.05206	1.7	0.217	2	0.03024	1.2	0.56	287.8	3.8	199.4	3.7	192	2.2	66.7
14_MT45_10	0.94	0.27	1966	0.05032	2.9	0.1668	3.3	0.02404	1.6	0.47	210	6.8	156.6	4.8	153.1	2.4	72.9
14_MT45_10	0.07	0.33	27568	0.04904	1.8	0.2708	2.4	0.04005	1.6	0.73	149.9	4.2	243.4	5.2	253.2	3.9	168.9

17_MT45_11	0.06	0.11	28408	0.0491	0.9	0.1825	1.3	0.02696	0.9	0.68	152.8	2.1	170.2	2	171.5	1.5	112.2
18_MT45_12	0.4	0.13	7300	0.04373	1.8	0.1411	2	0.02341	1	0.48	-126.1	4.4	134.1	2.6	149.2	1.5	-118.3
19_MT45_13	1.17	0.28	1578	0.04741	2.7	0.1485	3	0.02271	1.3	0.42	69.9	6.5	140.6	4	144.8	1.9	207.2
20_MT45_14	0.45	0.37	4055	0.04819	3.5	0.1883	3.8	0.02834	1.5	0.57	108.5	8.3	175.1	6.2	180.1	2.7	166.1
23_MT45_15	0.62	0.58	2975	0.05077	2.5	0.2171	2.7	0.03101	1.2	0.41	230.5	5.7	199.5	4.9	196.9	2.3	85.4
24_MT45_16	0.61	0.3	3670	0.04844	2.1	0.1665	2.4	0.02493	1.2	0.47	120.6	5.0	156.3	3.5	158.7	1.8	131.6
25_MT45_17	0.18	0.39	10324	0.04723	1.3	0.1453	1.9	0.02231	1.4	0.73	61	3.0	137.7	2.4	142.2	2	233.1
26_MT45_18	0.4	0.27	4605	0.04838	3.3	0.1792	3.6	0.02686	1.5	0.59	117.9	7.8	167.4	5.6	170.9	2.5	144.9
29_MT45_19	0.29	0.18	6391	0.0494	1.5	0.1824	1.7	0.02677	0.8	0.45	166.8	3.6	170.1	2.7	170.3	1.4	102.1
30_MT45_20	0.37	0.33	14164	0.05038	2.4	0.1834	2.7	0.0264	1.1	0.41	212.6	5.6	171	4.2	168	1.9	79.0
31_MT45_21	0.07	0.12	26698	0.05131	1.1	0.2987	1.6	0.04223	1.2	0.71	254.8	2.6	265.4	3.8	266.6	3	104.7
32_MT45_22	0.22	0.53	8518	0.04843	2.6	0.1518	3.1	0.02273	1.7	0.68	120.5	6.2	143.5	4.1	144.9	2.4	120.3
37_MT45_23	0.21	0.39	8804	0.04644	1.5	0.1771	2.5	0.02766	2	0.8	20.6	3.7	165.6	3.9	175.9	3.5	854.9
38_MT45_24.	0.7	0.34	3031	0.05151	2.5	0.2143	2.7	0.03018	1.1	0.39	263.7	5.8	197.2	4.9	191.7	2.1	72.7
39_MT45_25	0.1	0.16	17905	0.05263	1.3	0.3858	1.8	0.05316	1.3	0.7	313	2.9	331.3	5	333.9	4.1	106.7
40_MT45_26	0.32	0.14	5768	0.04835	3	0.1854	3.3	0.02782	1.5	0.62	116.2	7.0	172.7	5.3	176.9	2.7	152.2
43_MT45_SN	0.03	0.09	62424	0.05296	0.9	0.4056	2.3	0.05555	2.1	0.92	326.9	2.0	345.7	6.7	348.5	7.2	106.6
44_MT45_27	0.11	0.27	14361	0.05053	1.2	0.1995	1.5	0.02864	1	0.61	219.6	2.8	184.7	2.6	182	1.7	82.9
46_MT45_29	0.15	0.24	12728	0.04794	2.9	0.1583	3.4	0.02395	1.7	0.66	96.3	7.0	149.2	4.7	152.6	2.5	158.4
49_MT45_30	0.11	0.23	16716	0.04844	1.2	0.1587	1.5	0.02375	1	0.65	120.9	2.7	149.5	2.1	151.3	1.5	125.2
50_MT45_SN	0.11	0.13	13477	0.05111	1.1	0.3081	1.5	0.04373	1	0.65	245.8	2.6	272.7	3.7	275.9	2.8	112.2
51_MT45_SN	0.31	0.19	6026	0.04717	1.5	0.1452	1.9	0.02233	1.2	0.62	57.9	3.6	137.7	2.5	142.3	1.7	246.0
52_MT45_SN	0.05	0.19	30127	0.17134	1.5	9.1666	2.1	0.38802	1.5	0.73	2570.7	2.4	2354.8	19.1	2113.6	27	82.2
55_MT45_SN	0.13	0.3	14371	0.04967	1.1	0.1661	1.3	0.02426	0.8	0.55	179.7	2.5	156	1.9	154.5	1.2	86.0
56_MT45_SN.	0.5	0.35	5024	0.04795	1.5	0.1833	1.8	0.02772	1	0.53	96.8	3.6	170.9	2.9	176.3	1.8	182.1
57_MT45_SN	0.14	0.3	13141	0.04865	1.6	0.1903	2.2	0.02837	1.5	0.68	130.8	3.8	176.9	3.6	180.4	2.8	137.9
58_MT45_SN	0.12	0.21	15042	0.04693	2.1	0.1512	2.7	0.02337	1.7	0.72	45.9	5.1	143	3.6	148.9	2.5	324.4
Rejected analysis																	
06_MT45_04	1.17	0.27	1593	0.05076	1.6	0.0926	2.6	0.01324	2.1	0.83	229.8	3.6	90	2.3	84.8	1.8	36.9
45_MT45_28	0.14	0.24	12728	0.08238	13.2	0.4611	18.6	0.04059	13.2	0.71	1254.6	25.8	385	59.7	256.5	33.1	20.5