



Digital Supplement - Appendices

Investigation of Archean gamma-ray fingerprint: Methodology and tectonic application in central Brazil

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Major elements in weight percent (wt %) and trace elements in ppm; REE values normalized to chondrite of McDonough and Sun (1995); $Eu/Eu^* = Eu_N / (Sm_N \times Gd_N)^{1/2}$; LOI - Loss on ignition; FeOt as Fe_2O_3 .

Appendix 1. Analytical results of studied TTG.

Rock	Granodiorite	Tonalite	Tonalite	Tonalite
Sample	JS-09	JS-12	JS-17	JS-19
SiO ₂ (wt.%)	68.50	68.20	67.80	65.90
Al ₂ O ₃	15.90	16.90	16.50	16.50
Fe ₂ O ₃	3.13	2.55	3.86	4.21
MgO	1.03	0.80	1.20	1.35
CaO	2.59	2.38	3.22	3.00
Na ₂ O	5.02	5.53	5.37	5.36
K ₂ O	2.53	1.93	2.06	1.87
TiO ₂	0.37	0.33	0.48	0.57
P ₂ O ₅	0.19	0.17	0.27	0.32
LOI	0.54	0.49	0.30	0.31
Total	99.80	99.28	101.06	99.39
Ni (ppm)	4.20	2.50	4.90	5
V	10	5	20	31
Co	6.10	5	9	9.90
Sc	3.30	2.70	3.40	3.60
Cu	1.50	9.20	0.70	2.10
Pb	18.90	19.70	14.20	12.70
Zn	47	42	55	65
Mo	0.37	0.20	0.53	0.45
W	5.60	1.10	0.10	2.10
Sn	1.50	1.10	1.30	1.60
Rb	57.60	41.50	43.70	51.80
Ba	1736	1528	1471	565
Sr	899	1284	922	722
Nb	9.02	4.42	9.07	14.87
Ta	0.61	0.27	0.65	1.06
Y	9.29	7.75	11.66	19.27

Rock	Granodiorite	Tonalite	Tonalite	Tonalite
Sample	JS-09	JS-12	JS-17	JS-19
Zr	182	229	202	215
Hf	3.83	4.54	4.47	4.92
U	1.37	0.34	0.72	0.69
Th	6.10	3.30	6.70	8.80
Ga	17	17.90	18.20	18.50
Cs	1.93	0.52	0.95	1.16
La	38.70	31.20	45.60	54.90
Ce	59.70	44.20	70.90	89.40
Er	0.91	0.82	1.07	1.81
Nd	22.70	19.20	28.20	34.80
Sm	3.30	2.60	4	5.40
Eu	1.25	1.29	1.37	1.18
Gd	3.33	2.70	4.19	5.58
Dy	1.84	1.51	2.27	3.69
Ho	0.33	0.26	0.40	0.72
Pr	6.33	5.45	7.49	9.43
Tb	0.45	0.35	0.55	0.84
Tm	0.12	0.10	0.14	0.25
Yb	0.70	0.70	0.90	1.50
Lu	0.12	0.11	0.13	0.22
ΣETR	139.78	110.49	167.21	209.72
Eu/Eu*	1.15	1.49	1.03	0.66
(La/Yb)	37.27	30.05	34.16	24.68
La/Yb	55.29	44.57	50.67	36.60
K ₂ O/Na ₂ O	0.50	0.35	0.38	0.35
Sr/Y	96.77	165.68	79.07	37.47
Ba+Sr	2635	2812	2393	1287



Appendix 2. U-Pb data from zircon of sample JS-12, obtained by LA-HR-ICPMS.

Spot	f(206)%	206Pb cps	206Pb (mV) ¹	Th/U	RATIO				Data for Wetherill plot2					Ages (Ma)					Disc:3	Obs.	
					"206Pb 204Pb"	1s%	"207Pb 206Pb"	1s%	"207Pb 235U"	1s%	"206Pb 238U"	1s%	Rho	"207Pb 206Pb"	2s abs	"206Pb 238U"	2s abs	"207Pb 235U"			2s abs
ZR01	0.02	26	0.0037	0.55	62800	30.84	0.19530	0.53	13.357	1.18	0.4960	0.98	0.83	2787	17	2597	42	2705	22	6.85	1
ZR02N	0.45	390	0.0150	0.29	3456	9.65	0.11155	2.29	1.991	2.92	0.1295	1.78	0.61	1825	82	785	26	1113	39	57.00	1
ZR02B	0.03	54	0.0077	0.61	49491	79.93	0.19866	0.51	12.575	1.44	0.4591	1.29	0.90	2815	17	2435	52	2648	27	13.49	1
ZR03	0.05	50	0.0072	0.54	29113	46.31	0.12676	0.47	5.881	1.60	0.3365	1.48	0.93	2054	16	1870	48	1958	28	8.95	2
ZR04	0.04	24	0.0051	0.57	40269	30.06	0.19772	0.48	13.544	1.27	0.4968	1.11	0.88	2807	16	2600	48	2718	24	7.39	1
ZR05	0.04	28	0.0074	0.65	40451	41.28	0.19453	0.64	12.897	1.18	0.4808	0.92	0.78	2781	21	2531	38	2672	22	8.99	1
ZR06	0.88	181	0.0044	0.24	1762	12.48	0.06486	2.00	0.782	2.30	0.0874	1.07	0.46	770	83	540	11	586	20	29.85	3
ZR07	0.01	114	0.0074	0.86	147095	90.69	0.19731	0.88	13.173	1.50	0.4841	1.16	0.77	2804	29	2545	49	2692	28	9.23	1
ZR08	0.02	26	0.0069	0.87	95316	29.57	0.12436	0.72	5.111	1.37	0.2981	1.10	0.80	2020	26	1682	32	1838	23	16.74	2
ZR09	0.02	22	0.0075	0.48	85704	31.95	0.12556	0.71	5.131	1.77	0.2964	1.58	0.89	2037	25	1673	47	1841	30	17.84	2
ZR10	0	116	0.0063	0.52	4232	11.84	0.13785	2.22	6.119	2.58	0.3219	1.26	0.49	2200	76	1799	39	1993	44	18.24	4
ZR11	0.01	32	0.0087	0.24	120445	31.14	0.19765	4.00	14.193	5.12	0.5208	3.17	0.62	2807	128	2702	139	2763	95	3.72	6
ZR12	0.01	14	0.0077	0.50	234319	25.00	0.19178	0.56	10.775	2.20	0.4075	2.10	0.95	2758	18	2203	78	2504	41	20.10	1
ZR13	0.01	22	0.0109	0.48	190725	38.11	0.12524	0.47	5.300	1.03	0.3069	0.83	0.81	2032	17	1725	25	1869	17	15.10	2
ZR14	0.06	32	0.0090	0.43	23128	20.49	0.19439	0.44	11.498	1.15	0.4290	0.99	0.86	2780	14	2301	38	2564	21	17.22	1
ZR15N	0.06	64	0.0233	0.08	25316	8.47	0.26375	0.49	16.508	1.63	0.4539	1.51	0.93	3269	15	2413	61	2907	31	26.20	5
ZR15B	0.02	33	0.0051	0.43	62994	39.92	0.19307	0.88	11.911	2.65	0.4474	2.47	0.93	2769	29	2384	98	2597	49	13.90	1
ZR16N	0.01	18	0.0103	0.98	266163	37.56	0.19623	0.52	12.486	1.04	0.4614	0.82	0.79	2795	17	2446	33	2642	19	12.49	1
ZR16B	0.03	17	0.0023	0.22	54416	21.82	0.05833	0.89	0.657	1.49	0.0817	1.13	0.76	542	38	506	11	513	12	6.56	3
ZR17	0.02	28	0.0055	0.63	85953	30.86	0.19375	0.60	10.518	1.95	0.3937	1.82	0.93	2774	19	2140	66	2482	36	22.86	1
ZR18	0.02	25	0.0064	0.65	65639	38.41	0.20135	0.48	13.690	1.27	0.4931	1.12	0.88	2837	16	2584	48	2729	24	8.92	1
ZR19	0.05	34	0.0050	0.40	31127	50.80	0.19137	0.54	11.276	1.57	0.4273	1.43	0.91	2754	18	2294	55	2546	29	16.72	1
ZR20	0.01	17	0.0062	0.50	138402	29.95	0.19576	0.53	12.626	1.08	0.4677	0.86	0.80	2791	17	2474	35	2652	20	11.38	1
ZR21	0.06	67	0.0088	0.30	27681	51.40	0.12591	6.51	4.411	9.40	0.2541	6.77	0.72	2042	222	1460	176	1714	150	28.51	6
ZR22	0.02	24	0.0075	0.64	87421	36.09	0.19315	0.41	11.609	1.14	0.4359	1.00	0.87	2769	14	2332	39	2573	21	15.79	1
ZR23	0.02	26	0.0052	0.52	75146	35.79	0.19622	0.64	11.753	1.41	0.4344	1.20	0.85	2795	21	2325	47	2585	26	16.80	1
ZR24	0.03	23	0.0031	0.58	57728	22.86	0.19222	0.52	11.958	1.32	0.4511	1.16	0.88	2761	17	2400	46	2601	25	13.07	1
ZR25	0.01	21	0.0085	0.43	139031	42.05	0.12680	0.67	5.777	1.33	0.3304	1.10	0.82	2054	23	1840	35	1943	23	10.40	2
ZR26	0.40	180	0.0096	0.77	3773	9.92	0.19088	0.90	9.495	4.69	0.3608	4.59	0.98	2750	29	1986	156	2387	84	27.78	6
ZR27	0.16	87	0.0124	0.54	9551	7.98	0.12213	0.91	4.563	1.89	0.2709	1.62	0.86	1988	32	1546	44	1742	31	22.24	2
ZR28	0.01	24	0.0071	0.49	110427	30.99	0.12679	0.46	5.790	1.16	0.3311	1.00	0.86	2054	16	1844	32	1945	20	10.23	2
ZR31	0.03	46	0.0192	0.53	48821	23.76	0.19352	0.32	12.113	0.89	0.4539	0.75	0.84	2772	10	2413	30	2613	17	12.97	1
ZR29	0.00	28	0.0072	0.66	705187	77.13	0.19556	0.44	11.134	1.41	0.4129	1.28	0.91	2789	15	2228	48	2534	26	20.12	1
ZR30	0.14	88	0.0119	0.61	11395	16.24	0.11747	1.21	3.601	2.78	0.2223	2.48	0.89	1918	43	1294	58	1550	44	32.53	2
ZR32	0.04	42	0.0050	0.48	35067	47.14	0.19869	0.44	13.794	1.00	0.5035	0.82	0.82	2815	14	2629	36	2736	19	6.63	1
ZR33	0.02	41	0.0079	0.59	69948	60.09	0.19938	0.41	13.440	0.88	0.4889	0.69	0.78	2821	13	2566	29	2711	17	9.05	1
ZR34	0.04	43	0.0071	0.58	35628	48.19	0.19608	0.34	12.620	0.77	0.4668	0.59	0.76	2794	11	2469	24	2652	15	11.62	1
ZR35	0.02	45	0.0083	0.59	59770	32.66	0.20263	0.34	14.518	0.77	0.5196	0.57	0.75	2848	11	2697	25	2784	14	5.27	1
ZR36	0.07	38	0.0084	0.64	21177	15.14	0.20077	0.44	14.644	0.78	0.5290	0.54	0.68	2832	14	2737	24	2792	15	3.37	1

Appendix 2. Table of U-Pb data from zircon of sample JS-12, obtained by LA-HR-ICPMS. (continued)

Data report template (with modifications) from <http://www.plasmage.org/recommendations>

¹Conversion factor from mV to CPS is 62500000

²Not corrected for common-Pb

³Discordance calculated as $(1 - (206\text{Pb}/238\text{U age}/207\text{Pb}/206\text{Pb age})) * 100$

Decay constants of Jaffey et al 1971 used

Observations:

1- Archean spots used in age calculation of 2840 Ma

2- Paleoproterozoic spots used in age calculation of 2088 Ma

3- Neoproterozoic spots not used in age calculation

4- Paleoproterozoic spot not used in age calculation

5- Archean spot not used in age calculation

6- Data discarded due to high analytical error