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OXYGEN FUGACITY OF THE ALTO PARANAÍBA KIMBERLITES AND DIAMOND INSTABILITY: TRÊS RANCHOS IV AND LIMEIRA I INTRUSIONS
Bruna Coldebella, Rogério Guitarrari Azzone, Luanna Chmyz, Excelso Ruberti, Darcy P. Svisero

Supplementary Material - C -Tables of trace-element mineral compositions by LA-ICP-MS

Table C1	Mass spectrometer operating conditions coupled with the laser used for in-situ trace element analysis of olivine and perovskite
Table C2	Standards concentrations from LA-ICP-MS analyses.
Table C3	Trace element concentration, limit of detection and uncertanties (2-sigma error) of olivine from TR-IV and LM-I. C - core; R - rim; I - intermediate; LOD - limit of detection; b.d - below detection.
Table C4	Trace element concentration, limits of detection and uncertanties (2-sigma error) of perovskite from TR-IV and LM-I samples. C - core; LOD - limit of detection; b.d - below detection..

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Table C1. Mass spectrometer operating conditions coupled with the laser used for in-situ trace element analysis of olivine and perovskite

	Olivine	**Perovskite**
Primary Standard	BHVO	Nist-610
Power	80%	78%
Repetition rate	15 Hz	12Hz
Ablation mode	*spot*	*spot*
Spot/raster size	55 µm	30 µm

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TABLE C2- Standards concentrations from LA-ICP-MS analyses.

Sample: LMI-B1 (ol) 22/01/18																
Standard		Li	Na	Mg	Al	Si	P	Ca	Sc	Ti	V	Cr	Mn	Co	Ni	Cu
BHVO-2G	Primary	4.3	17457.0	42185.1	70921.5	230427.9	1265.7	80508.0	32.7	16070.4	303.5	287.7	1308.7	43.0	115.5	125.6
BHVO-2G	Primary	4.4	17958.5	43799.9	72610.3	230428.0	1256.8	81991.9	33.2	16459.5	310.6	295.4	1315.5	44.6	116.1	127.4
BHVO-2G	Primary	4.6	18384.1	43302.5	73350.0	230427.9	1289.0	82621.1	33.2	16509.5	313.3	301.3	1339.1	45.1	117.0	129.4
BHVO-2G	Primary	4.4	17860.6	42750.8	71852.4	230427.9	1260.3	81832.3	33.2	16381.1	308.8	293.6	1332.3	44.4	117.0	129.8
BHVO-2G	Primary	4.2	17416.1	42974.5	71243.7	230427.9	1257.9	80428.4	32.7	16090.5	303.9	287.4	1290.7	43.0	114.5	123.2
Average		**4.4**	**17815.3**	**43002.6**	**71995.6**	**230427.9**	**1265.9**	**81476.3**	**33.0**	**16302.2**	**308.0**	**293.1**	**1317.3**	**44.0**	**116.0**	**127.0**
SD		0.1	356.1	540.0	889.0	0.0	11.9	864.8	0.2	185.7	3.8	5.2	17.2	0.9	1.0	2.5
GeoRem		4.4	16400.0	43600.0	71300.0	233000.0	1200.0	81700.0	33.0	16300.0	308.0	293.0	1290.0	44.0	116.0	127.0
Uncertainty		0.8	600.0	700.0	800.0	3000.0	100.0	1200.0	2.0	900.0	19.0	12.0	40.0	2.0	7.0	11.0
Standard																
Nist-610	Secundary	505.8	118630.0	543.6	11551.9	325805.2	473.0	88837.0	515.1	494.6	449.1	380.6	483.6	412.5	461.9	611.4
Detection limit		**0.2**	**2.1**	**1.1**	**0.5**	**425.0**	**16.1**	**260.9**	**0.1**	**0.5**	**0.1**	**0.6**	**0.3**	**0.0**	**0.2**	**0.1**
GeoRem		468.0	97139.8	432.0	10489.8	331744.0	413.0	81763.4	455.0	452.0	450.0	408.0	444.0	410.0	458.7	441.0
Uncertainty		24.0	2603.1	29.0	258.5	6440.0	46.0	2128.4	10.0	10.0	9.0	10.0	13.0	10.0	4.0	15.0
Sample: LMI-C2 (ol) 22/01/18																
Standard		Li	Na	Mg	Al	Si	P	Ca	Sc	Ti	V	Cr	Mn	Co	Ni	Cu
BHVO-2G	Primary	4.5	17918.3	42631.0	72044.8	230427.9	1263.8	83272.8	34.0	16622.5	313.1	297.5	1340.7	45.6	119.1	128.3
BHVO-2G	Primary	4.3	17665.9	43312.0	71910.8	230427.9	1270.2	79835.1	32.1	16025.8	303.8	289.3	1297.2	42.6	113.3	125.9
BHVO-2G	Primary	4.5	18029.4	43317.9	72087.3	230427.9	1252.5	81018.7	32.9	16132.8	304.4	289.3	1301.2	44.1	114.9	126.0
BHVO-2G	Primary	4.3	17633.8	42676.4	71904.1	230428.0	1277.7	82093.9	33.2	16487.9	311.8	296.8	1334.2	44.1	117.3	128.1
Mean		**4.4**	**17811.9**	**42984.3**	**71986.7**	**230427.9**	**1266.0**	**81555.1**	**33.1**	**16317.2**	**308.3**	**293.2**	**1318.3**	**44.1**	**116.2**	**127.1**
SD		0.1	167.1	331.0	80.7	0.0	9.2	1273.5	0.7	245.6	4.2	3.9	19.3	1.1	2.2	1.1
GeoRem		4.4	16400.0	43600.0	71300.0	233000.0	1200.0	81700.0	33.0	16300.0	308.0	293.0	1290.0	44.0	116.0	127.0
Uncertainty		0.8	600.0	700.0	800.0	3000.0	100.0	1200.0	2.0	900.0	19.0	12.0	40.0	2.0	7.0	11.0
Standard																
Nist-610	Secundary	484.6	118493.6	543.5	11585.9	325805.2	456.8	88559.0	525.9	479.8	446.5	426.7	482.1	430.5	483.7	543.1
Detection limit		**0.2**	**2.0**	**1.2**	**0.5**	**433.9**	**17.0**	**224.2**	**0.1**	**0.5**	**0.1**	**0.6**	**0.3**	**0.0**	**0.3**	**0.1**
GeoRem		468.0	97139.8	432.0	10489.8	331744.0	413.0	81763.4	455.0	452.0	450.0	408.0	444.0	410.0	458.7	441.0
Uncertainty		24.0	2603.1	29.0	258.5	6440.0	46.0	2128.4	10.0	10.0	9.0	10.0	13.0	10.0	4.0	15.0

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Supplementary Material - C

TABLE C2- Standards concentrations from LA-ICP-MS analyses.

Sample: TRIV-5 (ol) 22/01/18																
Standard		Li	Na	Mg	Al	Si	P	Ca	Sc	Ti	V	Cr	Mn	Co	Ni	Cu
BHVO-2G	Primary	4.3	17863.3	43132.7	72456.1	230428.0	1254.7	82497.4	32.7	16481.7	311.9	294.6	1319.3	44.5	118.0	129.0
BHVO-2G	Primary	4.5	17703.9	42898.6	72106.6	230428.0	1293.4	80940.6	33.2	16160.0	304.6	293.4	1319.6	43.9	115.4	125.9
BHVO-2G	Primary	4.4	17938.6	42939.8	70833.1	230428.0	1235.0	80653.7	33.1	16271.8	308.5	289.6	1311.3	43.5	114.0	125.7
BHVO-2G	Primary	4.3	17615.7	42864.0	72033.0	230428.1	1265.0	80932.8	32.8	16104.4	302.8	289.7	1293.2	42.4	113.3	125.6
BHVO-2G	Primary	4.5	17937.4	43164.2	72601.3	230428.1	1282.5	82548.2	33.1	16532.4	313.4	298.4	1345.6	46.1	120.2	129.3
Mean		**4.4**	**17811.8**	**42999.8**	**72006.0**	**230428.0**	**1266.1**	**81514.6**	**33.0**	**16310.1**	**308.2**	**293.1**	**1317.8**	**44.1**	**116.2**	**127.1**
SD		0.1	130.1	124.1	623.5	0.0	20.6	829.9	0.2	170.4	4.1	3.3	16.9	1.2	2.6	1.7
GeoRem		4.4	16400.0	43600.0	71300.0	233000.0	1200.0	81700.0	33.0	16300.0	308.0	293.0	1290.0	44.0	116.0	127.0
Uncertainty		0.8	600.0	700.0	800.0	3000.0	100.0	1200.0	2.0	900.0	19.0	12.0	40.0	2.0	7.0	11.0
Standard																
Nist-610	Secundary	481.5	116984.4	529.7	11579.0	325805.3	471.9	89375.2	521.1	494.4	447.9	443.8	492.3	425.8	496.8	535.1
Detection limit		**0.2**	**2.2**	**0.7**	**0.6**	**484.2**	**18.9**	**239.7**	**0.1**	**0.8**	**0.1**	**0.7**	**0.4**	**0.0**	**0.4**	**0.1**
GeoRem		468.0	97139.8	432.0	10489.8	331744.0	413.0	81763.4	455.0	452.0	450.0	408.0	444.0	410.0	458.7	441.0
Uncertainty		24.0	2603.1	29.0	258.5	6440.0	46.0	2128.4	10.0	10.0	9.0	10.0	13.0	10.0	4.0	15.0
Sample: TRIV-5-3 (ol) 22/01/18																
Standard		Li	Na	Mg	Al	Si	P	Ca	Sc	Ti	V	Cr	Mn	Co	Ni	Cu
BHVO-2G	Primary	4.5	17853.6	43071.5	71909.9	230428.0	1256.6	82443.2	33.4	16411.7	309.2	294.5	1326.0	44.3	116.9	129.2
BHVO-2G	Primary	4.4	17782.2	42967.6	71776.3	230428.0	1275.0	80263.0	32.7	16171.9	306.1	291.2	1307.4	43.9	114.9	125.4
BHVO-2G	Primary	4.3	17732.5	42920.6	72960.2	230428.0	1282.1	82303.0	32.8	16364.9	310.6	294.9	1320.4	43.6	117.0	126.2
BHVO-2G	Primary	4.5	17816.7	42637.7	71078.2	230428.0	1209.2	80076.4	32.6	16122.1	304.5	287.0	1302.5	43.2	113.0	122.0
BHVO-2G	Primary	4.4	17842.0	43375.0	72297.7	230428.0	1311.6	82417.0	33.6	16439.9	309.9	297.8	1329.5	45.0	118.4	132.7
Mean		**4.4**	**17805.4**	**42994.5**	**72004.5**	**230428.0**	**1266.9**	**81500.5**	**33.0**	**16302.1**	**308.0**	**293.1**	**1317.2**	**44.0**	**116.0**	**127.1**
SD		0.1	43.9	238.4	619.4	0.0	33.8	1089.2	0.4	129.8	2.3	3.7	10.5	0.6	1.9	3.6
GeoRem		4.4	16400.0	43600.0	71300.0	233000.0	1200.0	81700.0	33.0	16300.0	308.0	293.0	1290.0	44.0	116.0	127.0
Uncertainty		0.8	600.0	700.0	800.0	3000.0	100.0	1200.0	2.0	900.0	19.0	12.0	40.0	2.0	7.0	11.0
Standard																
Nist-610	Secundary	488.1	113889.9	523.4	11258.6	325805.3	466.5	86974.3	501.0	488.5	441.0	437.9	478.3	414.2	453.4	520.5
Detection limit		**0.2**	**2.1**	**0.9**	**0.5**	**447.9**	**18.0**	**245.9**	**0.1**	**0.4**	**0.1**	**0.6**	**0.3**	**0.0**	**0.2**	**0.1**
GeoRem		468.0	97139.8	432.0	10489.8	331744.0	413.0	81763.4	455.0	452.0	450.0	408.0	444.0	410.0	458.7	441.0
Uncertainty		24.0	2603.1	29.0	258.5	6440.0	46.0	2128.4	10.0	10.0	9.0	10.0	13.0	10.0	4.0	15.0

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Supplementary Material - C

TABLE C2- Standards concentrations from LA-ICP-MS analyses.

Sample: LMI-C2 (pv) 22/01/18																
Standard		Li7	Mg24	Al27	Si29	P31	Ca42	Ca44	Sc45	Ti46	Ti49	V51	Cr52	Mn55	Fe56	Co59
Nist-610	Primary	506.6	483.3	10248.0	336373.8	374.3	81833.3	80298.1	430.7	407.4	403.7	419.4	381.9	409.6	429.2	384.1
Nist-610	Primary	464.3	449.4	9810.4	320333.6	293.2	81833.3	83769.0	455.1	478.2	473.4	481.1	448.3	488.2	518.6	449.4
Nist-610	Primary	479.8	460.0	9881.6	326070.2	343.9	81833.3	82141.6	442.1	421.8	433.6	437.2	400.7	418.8	440.6	393.3
Nist-610	Primary	453.0	451.5	9853.8	329082.6	430.1	81833.3	80487.5	431.7	431.4	425.6	419.3	391.8	397.2	431.3	381.2
Nist-610	Primary	488.8	469.6	10096.5	330156.3	343.4	81833.3	81557.0	439.8	438.8	431.9	442.6	406.1	440.5	465.1	410.5
Mean		**478.5**	**462.7**	**9978.1**	**328403.3**	**357.0**	**81833.3**	**81650.6**	**439.9**	**435.5**	**433.6**	**439.9**	**405.7**	**430.8**	**457.0**	**403.7**
SD		18.7	12.5	167.2	5246.5	44.9	0.0	1258.5	8.8	23.8	22.5	22.6	22.8	32.0	33.3	25.0
GeoRem		468.0	97139.8	432.0	10489.8	331744.0	413.0	81763.4	455.0	452.0	450.0	408.0	444.0	410.0	458.7	441.0
Uncertainty		24.0	2603.1	29.0	258.5	6440.0	46.0	2128.4	10.0	10.0	9.0	10.0	13.0	10.0	4.0	15.0
Standard																
BHVO-2G	Secundary	4.9	37662.5	60740.9	247903.1	1133.3	81475.9	77710.5	29.4	13254.9	#####	302.0	277.7	1193.1	#####	43.7
Detection limit		**1.0**	**0.7**	**2.8**	**1949.4**	**75.3**	**1358.0**	**194.6**	**0.5**	**5.6**	**3.1**	**0.6**	**3.0**	**1.9**	**13.5**	**0.2**
GeoRem		4.4	16400.0	43600.0	71300.0	233000.0	1200.0	81700.0	33.0	16300.0	308.0	293.0	1290.0	44.0	116.0	127.0
Uncertainty		0.8	600.0	700.0	800.0	3000.0	100.0	1200.0	2.0	900.0	19.0	12.0	40.0	2.0	7.0	11.0
Sample: TRIV-5 (pv) 22/01/18																
Standard		Li7	Mg24	Al27	Si29	P31	Ca42	Ca44	Sc45	Ti46	Ti49	V51	Cr52	Mn55	Fe56	Co59
Nist-610	Primary	465.0	442.4	9569.9	324652.9	390.1	81833.3	77766.0	422.5	415.1	415.3	427.9	391.6	413.8	451.0	384.8
Nist-610	Primary	525.4	505.9	10898.5	335649.3	260.8	81833.3	91045.1	480.2	471.5	464.6	471.1	435.3	472.9	464.2	446.7
Nist-610	Primary	457.3	462.6	9804.3	321375.8	383.7	81833.3	77940.4	421.5	398.1	421.5	415.1	377.4	416.6	468.7	387.1
Nist-610	Primary	513.3	464.6	10160.0	335273.7	306.5	81833.3	85841.8	460.9	470.9	443.6	471.5	437.0	448.9	445.2	421.9
Mean		**490.2**	**468.9**	**10108.2**	**329237.9**	**335.3**	**81833.3**	**83148.3**	**446.3**	**438.9**	**436.2**	**446.4**	**410.3**	**438.0**	**457.3**	**410.1**
SD		29.6	23.1	502.3	6331.9	54.2	0.0	5605.9	25.2	32.8	19.5	25.3	26.3	24.4	9.5	25.7
GeoRem		468.0	97139.8	432.0	10489.8	331744.0	413.0	81763.4	455.0	452.0	450.0	408.0	444.0	410.0	458.7	441.0
Uncertainty		24.0	2603.1	29.0	258.5	6440.0	46.0	2128.4	10.0	10.0	9.0	10.0	13.0	10.0	4.0	15.0
Standard																
BHVO-2G	Secundary	6.0	41075.0	66800.9	258386.3	1063.7	81475.9	83356.2	32.0	13232.6	#####	333.3	297.6	1312.1	#####	48.2
Detection limit		**1.0**	**0.8**	**2.7**	**1956.0**	**65.7**	**1234.3**	**196.7**	**0.5**	**5.5**	**3.5**	**0.6**	**3.2**	**1.9**	**12.8**	**0.2**
GeoRem		4.4	16400.0	43600.0	71300.0	233000.0	1200.0	81700.0	33.0	16300.0	308.0	293.0	1290.0	44.0	116.0	127.0
Uncertainty		0.8	600.0	700.0	800.0	3000.0	100.0	1200.0	2.0	900.0	19.0	12.0	40.0	2.0	7.0	11.0

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Supplementary Material - A3

TABLE A3(2)- Standards concentrations from LA-ICP-MS analyses.

Sample: LMI-C2 (pv) 22/01/18

Sample: TRIV-5-3 (pv) 22/01/18

Standard		Li7	Mg24	Al27	Si29	P31	Ca42	Ca44	Sc45	Ti46	Ti49	V51	Cr52	Mn55	Fe56	Co59
Nist-610	Primary	506.7	479.3	10278.9	332487.8	339.6	81833.2	81454.3	437.7	429.9	436.5	443.3	404.7	438.0	476.9	410.2
Nist-610	Primary	464.8	452.0	9753.5	324290.1	345.5	81833.2	82227.5	444.7	438.3	431.4	440.0	405.8	428.7	438.5	399.9
Nist-610	Primary	502.7	513.6	10864.9	359154.4	421.9	81833.3	82327.0	430.8	449.1	406.0	445.0	437.9	472.9	512.8	451.8
Nist-610	Primary	487.4	467.1	10041.4	328868.9	342.1	81833.3	81781.0	440.6	433.5	434.3	441.9	405.1	433.9	459.6	405.6
Mean		**490.4**	**478.0**	**10234.7**	**336200.3**	**362.3**	**81833.2**	**81947.5**	**438.5**	**437.7**	**427.1**	**442.6**	**413.3**	**443.4**	**472.0**	**416.9**
SD		16.4	22.7	408.7	13567.2	34.5	0.0	351.2	5.1	7.2	12.3	1.8	14.2	17.4	27.2	20.5
GeoRem		468.0	97139.8	432.0	10489.8	331744.0	413.0	81763.4	455.0	452.0	450.0	408.0	444.0	410.0	458.7	441.0
Uncertainty		24.0	2603.1	29.0	258.5	6440.0	46.0	2128.4	10.0	10.0	9.0	10.0	13.0	10.0	4.0	15.0
Standard																
BHVO-2G	Secundary	4.1	39585.0	61627.8	259163.4	1173.9	81475.9	78906.4	28.3	13640.6	######	311.8	297.4	1326.4	######	50.4
Detection limit		**1.3**	**0.6**	**2.7**	**1894.7**	**65.5**	**1378.4**	**193.6**	**0.5**	**5.4**	**2.4**	**0.7**	**3.1**	**1.9**	**14.5**	**0.2**
GeoRem		4.4	16400.0	43600.0	71300.0	233000.0	1200.0	81700.0	33.0	16300.0	308.0	293.0	1290.0	44.0	116.0	127.0
Uncertainty		0.8	600.0	700.0	800.0	3000.0	100.0	1200.0	2.0	900.0	19.0	12.0	40.0	2.0	7.0	11.0

Sample: LMI-C1 (ol) 23/01/18

Standard		Li	Na	Mg	Al	Si	P	Ca	Sc	Ti	V	Cr	Mn	Co	Ni	Cu
BHVO-2G	Primary	4.3	17407.8	42580.2	71549.0	230428.0	1256.3	82197.8	33.2	16438.3	306.7	295.5	1328.5	43.9	114.9	124.0
BHVO-2G	Primary	4.5	18138.6	43523.0	72658.5	230428.0	1284.6	81279.7	33.0	16317.3	310.2	291.5	1311.9	44.1	116.9	129.7
BHVO-2G	Primary	4.6	17941.7	43074.2	72423.0	230428.0	1288.4	82182.5	33.2	16309.4	307.3	289.2	1304.6	43.6	114.6	124.6
BHVO-2G	Primary	4.2	17517.4	42991.8	71839.2	230428.0	1256.9	81620.7	33.2	16516.1	309.6	297.9	1337.9	44.3	116.6	128.1
Mean		**4.4**	**17751.4**	**43042.3**	**72117.4**	**230428.0**	**1271.5**	**81820.2**	**33.2**	**16395.3**	**308.4**	**293.5**	**1320.7**	**44.0**	**115.7**	**126.6**
SD		0.2	299.6	334.8	443.5	0.0	15.0	389.2	0.1	86.4	1.5	3.4	13.2	0.3	1.0	2.4
GeoRem		4.4	16400.0	43600.0	71300.0	233000.0	1200.0	81700.0	33.0	16300.0	308.0	293.0	1290.0	44.0	116.0	127.0
Uncertainty		0.8	600.0	700.0	800.0	3000.0	100.0	1200.0	2.0	900.0	19.0	12.0	40.0	2.0	7.0	11.0
Standard																
Nist-610	Secundary	483.5	115797.1	535.0	11576.5	325805.3	468.3	90584.7	517.1	489.8	457.1	449.5	493.1	422.4	460.3	503.9
Detection limit		**0.1**	**1.9**	**1.2**	**0.5**	**423.0**	**15.4**	**240.4**	**0.1**	**0.5**	**0.1**	**0.6**	**0.3**	**0.0**	**0.1**	**0.1**
GeoRem		468.0	97139.8	432.0	10489.8	331744.0	413.0	81763.4	455.0	452.0	450.0	408.0	444.0	410.0	458.7	441.0
Uncertainty		24.0	2603.1	29.0	258.5	6440.0	46.0	2128.4	10.0	10.0	9.0	10.0	13.0	10.0	4.0	15.0
Standard																
BIR	Secundary	3.0	14439.5	57487.9	84502.3	223295.8	99.5	96979.7	46.3	5817.4	322.6	414.4	1397.9	53.5	175.8	129.8
Detection limit		**0.1**	**1.6**	**1.0**	**0.4**	**339.4**	**11.9**	**191.6**	**0.1**	**0.5**	**0.1**	**0.5**	**0.3**	**0.0**	**0.1**	**0.1**
GeoRem		3.2	13131.0	57854.0	81813.0	228999.8	96.0	91688.2	43.2	5423.8	320.6	392.9	1382.8	52.2	168.9	120.7
Uncertainty		0.1	6.0	5.0	6.0	1.8	9.7	687.6	0.6	99.3	2.9	3.9	23.7	0.6	1.9	1.6

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Bruna Coldebella, Rogério Guitarrari Azzone, Luanna Chmyz, Excelso Ruberti, Darcy P. Svisero

Supplementary Material - C

TABLE C2- Standards concentrations from LA-ICP-MS analyses.

Sample: LMI-B1 (ol) 22/01/18																		
Standard		Zn	Rb	Sr	Y	Zr	Nb	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho
BHVO-2G	Primary	99.8	9.1	386.4	25.3	165.9	18.0	127.3	14.8	36.7	5.2	24.3	5.8	2.1	6.0	0.9	5.0	0.9
BHVO-2G	Primary	102.5	9.2	404.2	26.8	173.4	18.5	133.9	15.4	38.4	5.5	24.5	6.4	2.1	6.3	0.9	5.6	1.0
BHVO-2G	Primary	106.3	9.3	401.7	26.2	172.8	18.7	134.3	15.7	38.2	5.4	25.1	6.2	2.1	6.3	1.0	5.6	1.0
BHVO-2G	Primary	103.8	9.3	401.2	26.2	171.8	18.6	129.4	15.5	37.7	5.4	24.1	6.2	2.1	6.1	0.9	5.3	1.0
BHVO-2G	Primary	97.9	9.1	387.5	25.7	166.5	17.9	130.3	14.6	37.1	5.3	24.5	6.0	2.0	6.1	0.9	5.1	0.9
Average		**102.1**	**9.2**	**396.2**	**26.0**	**170.1**	**18.3**	**131.0**	**15.2**	**37.6**	**5.4**	**24.5**	**6.1**	**2.1**	**6.2**	**0.9**	**5.3**	**1.0**
SD		2.9	0.1	7.6	0.5	3.2	0.3	2.7	0.4	0.7	0.1	0.3	0.2	0.0	0.1	0.0	0.2	0.1
GeoRem		102.0	9.2	396.0	26.0	170.0	18.3	131.0	15.2	37.6	5.4	24.5	6.1	2.1	6.2	0.9	5.3	1.0
Uncertainty		6.0	0.0	0.0	2.0	7.0	0.8	2.0	0.2	0.2	0.2	0.2	0.0	0.0	0.1	0.0	0.1	0.0
Standard																		
Nist-610	Secundary	371.9	435.6	556.1	565.4	523.7	529.2	496.7	496.5	518.8	523.1	493.4	527.2	496.9	495.8	513.7	506.1	511.3
Detection limit		**0.6**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**
GeoRem		460.0	425.7	515.5	462.0	448.0	465.0	452.0	440.0	453.0	448.0	430.0	453.0	447.0	449.0	437.0	437.0	449.0
Uncertainty		18.0	1.0	1.0	11.0	9.0	34.0	9.0	10.0	8.0	7.0	8.0	11.0	12.0	12.0	9.0	11.0	12.0
Sample: LMI-C2 (ol) 22/01/18																		
Standard		Zn	Rb	Sr	Y	Zr	Nb	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho
BHVO-2G	Primary	101.5	9.4	397.2	26.0	170.5	18.6	133.2	15.4	37.7	5.4	26.0	6.4	2.0	6.2	0.9	5.4	1.0
BHVO-2G	Primary	102.2	9.1	395.5	26.1	169.9	18.1	129.4	15.1	37.6	5.4	23.3	5.9	2.1	6.1	0.9	5.3	0.9
BHVO-2G	Primary	103.8	9.1	391.9	25.8	167.7	18.0	128.0	14.6	36.8	5.4	23.7	5.8	2.1	6.2	0.9	4.9	0.9
BHVO-2G	Primary	100.5	9.3	399.8	26.2	172.1	18.6	134.0	15.8	38.4	5.3	25.5	6.4	2.1	6.2	0.9	5.6	1.0
Mean		**102.0**	**9.2**	**396.1**	**26.0**	**170.0**	**18.3**	**131.1**	**15.2**	**37.6**	**5.4**	**24.6**	**6.1**	**2.1**	**6.2**	**0.9**	**5.3**	**1.0**
SD		1.2	0.1	2.8	0.2	1.6	0.3	2.5	0.4	0.6	0.0	1.1	0.3	0.0	0.0	0.0	0.3	0.1
GeoRem		102.0	9.2	396.0	26.0	170.0	18.3	131.0	15.2	37.6	5.4	24.5	6.1	2.1	6.2	0.9	5.3	1.0
Uncertainty		6.0	0.0	0.0	2.0	7.0	0.8	2.0	0.2	0.2	0.2	0.2	0.0	0.0	0.1	0.0	0.1	0.0
Standard																		
Nist-610	Secundary	375.4	453.7	562.4	559.2	512.1	515.6	483.8	468.8	496.7	496.7	486.1	506.1	492.9	501.9	495.5	519.7	510.5
Detection limit		**0.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.0**	**0.1**	**0.0**	**0.1**	**0.0**
GeoRem		460.0	425.7	515.5	462.0	448.0	465.0	452.0	440.0	453.0	448.0	430.0	453.0	447.0	449.0	437.0	437.0	449.0
Uncertainty		18.0	1.0	1.0	11.0	9.0	34.0	9.0	10.0	8.0	7.0	8.0	11.0	12.0	12.0	9.0	11.0	12.0

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Supplementary Material - C

TABLE C2- Standards concentrations from LA-ICP-MS analyses.

Sample: TRIV-5 (ol) 22/01/18																		
Standard		Zn	Rb	Sr	Y	Zr	Nb	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho
BHVO-2G	Primary	101.0	9.4	396.4	25.8	169.0	18.3	131.7	15.2	37.6	5.3	23.7	6.2	2.1	6.1	0.9	5.2	1.0
BHVO-2G	Primary	103.8	9.0	395.9	26.0	171.6	18.5	130.4	15.1	37.4	5.3	25.1	6.0	2.0	6.3	0.9	5.2	1.0
BHVO-2G	Primary	100.5	9.3	397.6	26.4	169.1	18.0	131.6	15.5	38.3	5.5	24.9	6.1	2.1	6.1	0.9	5.6	1.0
BHVO-2G	Primary	100.8	8.9	384.9	25.5	168.3	18.1	127.5	14.9	36.5	5.2	24.2	6.2	2.0	5.8	0.9	5.0	1.0
BHVO-2G	Primary	104.0	9.4	407.2	26.3	172.1	18.7	134.5	15.3	38.4	5.4	24.6	6.0	2.2	6.6	1.0	5.4	1.0
Mean		**102.0**	**9.2**	**396.4**	**26.0**	**170.0**	**18.3**	**131.1**	**15.2**	**37.6**	**5.4**	**24.5**	**6.1**	**2.1**	**6.2**	**0.9**	**5.3**	**1.0**
SD		1.5	0.2	7.1	0.4	1.5	0.3	2.3	0.2	0.7	0.1	0.5	0.1	0.1	0.2	0.0	0.2	0.0
GeoRem		102.0	9.2	396.0	26.0	170.0	18.3	131.0	15.2	37.6	5.4	24.5	6.1	2.1	6.2	0.9	5.3	1.0
Uncertainty		6.0	0.0	0.0	2.0	7.0	0.8	2.0	0.2	0.2	0.2	0.2	0.0	0.0	0.1	0.0	0.1	0.0
Standard																		
Nist-610	Secundary	405.8	456.6	581.0	553.2	501.3	515.8	472.2	470.6	492.7	509.2	478.9	500.2	487.9	495.8	491.6	487.1	510.3
Detection limit		**0.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.0**	**0.1**	**0.0**	**0.1**	**0.0**
GeoRem		460.0	425.7	515.5	462.0	448.0	465.0	452.0	440.0	453.0	448.0	430.0	453.0	447.0	449.0	437.0	437.0	449.0
Uncertainty		18.0	1.0	1.0	11.0	9.0	34.0	9.0	10.0	8.0	7.0	8.0	11.0	12.0	12.0	9.0	11.0	12.0
Sample: TRIV-5-3 (ol) 22/01/18																		
Standard		Zn	Rb	Sr	Y	Zr	Nb	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho
BHVO-2G	Primary	100.6	9.3	396.0	25.9	169.3	18.4	129.4	15.3	37.4	5.4	24.1	6.3	2.1	6.1	0.9	5.5	1.0
BHVO-2G	Primary	103.4	9.0	394.9	26.0	169.9	18.1	132.7	15.2	38.0	5.3	25.3	6.0	2.1	6.2	0.9	5.0	0.9
BHVO-2G	Primary	103.1	9.5	399.7	26.3	172.8	18.5	131.8	15.0	37.3	5.3	24.1	5.9	2.0	6.3	0.9	5.6	1.0
BHVO-2G	Primary	98.4	9.1	393.4	26.1	167.8	18.0	129.2	14.9	36.9	5.3	23.7	6.4	2.0	6.1	0.9	5.1	1.0
BHVO-2G	Primary	104.8	9.2	396.4	25.8	170.5	18.5	132.1	15.6	38.5	5.5	25.6	6.0	2.2	6.2	1.0	5.3	1.0
Mean		**102.1**	**9.2**	**396.1**	**26.0**	**170.0**	**18.3**	**131.0**	**15.2**	**37.6**	**5.4**	**24.5**	**6.1**	**2.1**	**6.2**	**0.9**	**5.3**	**1.0**
SD		2.3	0.2	2.1	0.2	1.6	0.2	1.5	0.3	0.6	0.1	0.8	0.2	0.1	0.1	0.0	0.2	0.0
GeoRem		102.0	9.2	396.0	26.0	170.0	18.3	131.0	15.2	37.6	5.4	24.5	6.1	2.1	6.2	0.9	5.3	1.0
Uncertainty		6.0	0.0	0.0	2.0	7.0	0.8	2.0	0.2	0.2	0.2	0.2	0.0	0.0	0.1	0.0	0.1	0.0
Standard																		
Nist-610	Secundary	385.5	438.7	546.5	535.1	496.9	517.5	481.5	466.9	483.6	487.9	465.6	470.0	469.2	494.7	482.5	468.0	506.6
Detection limit		**0.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.1**	**0.0**	**0.1**	**0.0**
GeoRem		460.0	425.7	515.5	462.0	448.0	465.0	452.0	440.0	453.0	448.0	430.0	453.0	447.0	449.0	437.0	437.0	449.0
Uncertainty		18.0	1.0	1.0	11.0	9.0	34.0	9.0	10.0	8.0	7.0	8.0	11.0	12.0	12.0	9.0	11.0	12.0

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Supplementary Material - C

TABLE C2- Standards concentrations from LA-ICP-MS analyses.

Sample: LMI-C2 (pv) 22/01/18																		
Standard		Sr88	Y89	Zr91	Nb93	Sn118	Sb121	Ba137	La139	Ce140	Pr141	Nd143	Sm147	Eu151	Gd157	Tb159	Dy161	Ho165
Nist-610	Primary	473.8	####	416.1	409.6	396.0	371.0	432.7	465.3	451.7	436.6	438.4	448.4	458.6	418.6	443.8	428.0	439.7
Nist-610	Primary	560.2	####	490.9	448.7	409.0	393.9	443.1	477.8	474.8	453.5	445.4	472.7	477.0	427.4	450.4	428.1	466.8
Nist-610	Primary	476.3	####	420.3	403.3	379.6	335.6	385.0	425.2	415.0	397.2	398.7	424.6	446.9	411.8	432.5	421.7	446.0
Nist-610	Primary	455.7	####	410.0	371.0	352.3	329.1	366.0	415.6	396.9	399.6	397.9	387.4	422.2	372.8	401.3	382.8	408.0
Nist-610	Primary	509.5	####	449.8	429.2	406.7	392.1	451.2	480.9	471.7	453.9	452.0	466.6	469.7	424.5	449.2	429.4	450.7
Mean		**495.1**	**####**	**437.4**	**412.4**	**388.7**	**364.3**	**415.6**	**453.0**	**442.0**	**428.1**	**426.5**	**440.0**	**454.9**	**411.0**	**435.4**	**418.0**	**442.2**
SD		36.9	30.2	30.1	26.1	21.0	27.4	33.8	27.2	31.0	25.1	23.4	31.1	19.3	19.8	18.2	17.8	19.3
GeoRem		460.0	####	515.5	462.0	448.0	465.0	452.0	440.0	453.0	448.0	430.0	453.0	447.0	449.0	437.0	437.0	449.0
Uncertainty		18.0	1.0	1.0	11.0	9.0	34.0	9.0	10.0	8.0	7.0	8.0	11.0	12.0	12.0	9.0	11.0	12.0
Standard																		
BHVO-2G	Secundary	358.5	22.5	157.6	15.0	3.5	0.5	109.9	16.0	37.3	5.1	24.9	5.6	2.1	6.3	0.9	5.1	0.9
Detection limit		**0.1**	**0.1**	**0.4**	**0.1**	**1.8**	**0.5**	**0.5**	**0.1**	**0.1**	**0.1**	**0.4**	**0.5**	**0.1**	**0.3**	**0.1**	**0.3**	**0.1**
GeoRem		102.0	9.2	396.0	26.0	170.0	18.3	131.0	15.2	37.6	5.4	24.5	6.1	2.1	6.2	0.9	5.3	1.0
Uncertainty		6.0	0.0	0.0	2.0	7.0	0.8	2.0	0.2	0.2	0.2	0.2	0.0	0.0	0.1	0.0	0.1	0.0

Sample: TRIV-5 (pv) 22/01/18																		
Standard		Sr88	Y89	Zr91	Nb93	Sn118	Sb121	Ba137	La139	Ce140	Pr141	Nd143	Sm147	Eu151	Gd157	Tb159	Dy161	Ho165
Nist-610	Primary	473.1	####	420.5	398.8	370.0	351.3	401.2	440.0	435.9	411.7	411.4	432.9	441.6	406.0	427.0	403.5	428.6
Nist-610	Primary	551.2	####	475.6	460.9	448.7	400.5	464.9	490.5	466.2	465.0	464.4	479.3	496.8	442.0	470.5	469.7	489.2
Nist-610	Primary	471.5	####	424.0	409.0	386.2	360.0	414.9	449.8	455.7	423.2	424.1	450.6	461.9	424.2	446.5	423.1	451.0
Nist-610	Primary	524.3	####	453.4	427.5	402.7	374.6	429.8	462.8	439.0	434.0	434.4	447.9	457.6	414.1	437.2	426.4	445.0
Mean		**505.0**	**####**	**443.4**	**424.0**	**401.9**	**371.6**	**427.7**	**460.8**	**449.2**	**433.5**	**433.6**	**452.7**	**464.5**	**421.6**	**445.3**	**430.7**	**453.4**
SD		34.1	32.0	22.6	23.6	29.4	18.6	23.8	19.0	12.4	19.8	19.6	16.8	20.1	13.4	16.1	24.2	22.2
GeoRem		460.0	####	515.5	462.0	448.0	465.0	452.0	440.0	453.0	448.0	430.0	453.0	447.0	449.0	437.0	437.0	449.0
Uncertainty		18.0	1.0	1.0	11.0	9.0	34.0	9.0	10.0	8.0	7.0	8.0	11.0	12.0	12.0	9.0	11.0	12.0
Standard																		
BHVO-2G	Secundary	387.3	25.1	178.2	17.4	4.3	<0.57	129.9	16.3	37.3	5.2	24.0	7.1	2.5	7.3	1.1	5.4	1.0
Detection limit		**0.1**	**0.0**	**0.3**	**0.1**	**1.8**	**0.6**	**0.5**	**0.1**	**0.1**	**0.1**	**0.5**	**0.4**	**0.1**	**0.3**	**0.1**	**0.3**	**0.1**
GeoRem		102.0	9.2	396.0	26.0	170.0	18.3	131.0	15.2	37.6	5.4	24.5	6.1	2.1	6.2	0.9	5.3	1.0
Uncertainty		6.0	0.0	0.0	2.0	7.0	0.8	2.0	0.2	0.2	0.2	0.2	0.0	0.0	0.1	0.0	0.1	0.0

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Bruna Coldebella, Rogério Guitarrari Azzone, Luanna Chmyz, Excelso Ruberti, Darcy P. Svisero

Supplementary Material - A3

TABLE A3(2)- Standards concentrations from LA-ICP-MS analyses.

Sample: LMI-C2 (pv) 22/01/18

Sample: TRIV-5-3 (pv) 22/01/18

Standard		Sr88	Y89	Zr91	Nb93	Sn118	Sb121	Ba137	La139	Ce140	Pr141	Nd143	Sm147	Eu151	Gd157	Tb159	Dy161	Ho165
Nist-610	Primary	505.8	466.2	449.1	432.7	413.4	388.5	449.3	494.9	476.5	457.3	454.4	466.4	490.1	451.1	474.1	449.4	472.2
Nist-610	Primary	489.4	435.4	430.9	407.3	380.8	351.0	401.7	428.0	424.1	407.2	409.6	435.6	437.0	393.9	417.7	406.5	430.0
Nist-610	Primary	556.5	494.2	473.8	442.7	429.5	401.1	493.6	531.8	489.9	489.1	476.2	475.7	471.4	431.0	449.8	434.2	444.9
Nist-610	Primary	498.4	451.7	441.0	421.0	398.3	370.8	427.2	461.6	451.2	432.9	433.7	452.5	464.5	423.6	446.4	429.2	452.0
Mean		**512.5**	**461.9**	**448.7**	**425.9**	**405.5**	**377.8**	**442.9**	**479.1**	**460.4**	**446.6**	**443.5**	**457.5**	**465.7**	**424.9**	**447.0**	**429.8**	**449.8**
SD		26.0	21.6	15.8	13.2	18.0	18.9	33.8	38.6	25.2	30.2	24.6	15.1	19.1	20.5	20.0	15.4	15.2
GeoRem		460.0	425.7	515.5	462.0	448.0	465.0	452.0	440.0	453.0	448.0	430.0	453.0	447.0	449.0	437.0	437.0	449.0
Uncertainty		18.0	1.0	1.0	11.0	9.0	34.0	9.0	10.0	8.0	7.0	8.0	11.0	12.0	12.0	9.0	11.0	12.0
Standard																		
BHVO-2G	Secundary	405.3	26.1	170.1	17.8	4.8	<0.58	131.3	19.3	41.4	5.9	25.9	6.1	2.4	6.0	1.0	5.8	1.0
Detection limit		**0.1**	**0.0**	**0.5**	**0.1**	**1.8**	**0.6**	**0.5**	**0.1**	**0.1**	**0.1**	**0.9**	**0.5**	**0.1**	**0.4**	**0.1**	**0.3**	**0.0**
GeoRem		102.0	9.2	396.0	26.0	170.0	18.3	131.0	15.2	37.6	5.4	24.5	6.1	2.1	6.2	0.9	5.3	1.0
Uncertainty		6.0	0.0	0.0	2.0	7.0	0.8	2.0	0.2	0.2	0.2	0.2	0.0	0.0	0.1	0.0	0.1	0.0

Sample: LMI-C1 (ol) 23/01/18

Standard		Zn	Rb	Sr	Y	Zr	Nb	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho
BHVO-2G	Primary	101.6	8.9	394.0	26.2	170.0	18.4	131.7	15.3	37.7	5.4	24.9	6.3	2.1	6.0	0.9	5.3	1.0
BHVO-2G	Primary	103.5	9.6	398.3	26.0	172.1	18.4	130.6	15.1	37.8	5.3	24.2	6.0	2.2	6.3	0.9	5.3	1.0
BHVO-2G	Primary	100.9	8.9	390.9	25.8	169.7	18.4	130.2	15.0	37.0	5.3	24.2	6.1	2.0	5.9	0.9	5.2	1.0
BHVO-2G	Primary	104.3	9.4	400.7	26.4	173.0	18.6	132.2	15.4	38.5	5.4	25.0	6.2	2.2	6.3	0.9	5.4	1.0
Mean		**102.6**	**9.2**	**396.0**	**26.1**	**171.2**	**18.4**	**131.2**	**15.2**	**37.8**	**5.4**	**24.6**	**6.1**	**2.1**	**6.1**	**0.9**	**5.3**	**1.0**
SD		1.4	0.3	3.8	0.2	1.4	0.1	0.8	0.2	0.5	0.1	0.4	0.1	0.1	0.2	0.0	0.1	0.0
GeoRem		102.0	9.2	396.0	26.0	170.0	18.3	131.0	15.2	37.6	5.4	24.5	6.1	2.1	6.2	0.9	5.3	1.0
Uncertainty		6.0	0.0	0.0	2.0	7.0	0.8	2.0	0.2	0.2	0.2	0.2	0.0	0.0	0.1	0.0	0.1	0.0
Standard																		
Nist-610	Secundary	383.0	459.1	560.6	551.4	513.5	519.8	490.1	487.4	503.1	504.8	478.9	491.1	507.7	491.8	475.2	476.5	518.6
Detection limit		**0.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.0**	**0.1**	**0.0**	**0.1**	**0.0**
GeoRem		460.0	425.7	515.5	462.0	448.0	465.0	452.0	440.0	453.0	448.0	430.0	453.0	447.0	449.0	437.0	437.0	449.0
Uncertainty		18.0	1.0	1.0	11.0	9.0	34.0	9.0	10.0	8.0	7.0	8.0	11.0	12.0	12.0	9.0	11.0	12.0
Standard																		
BIR	Secundary	67.9	0.2	110.1	16.1	15.2	0.6	7.3	0.6	2.0	0.4	2.6	1.2	0.5	1.7	0.4	2.7	0.7
Detection limit		**0.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
GeoRem		70.4	0.2	108.6	15.6	14.8	0.6	6.8	0.6	1.9	0.4	2.4	1.1	0.5	1.8	0.4	2.5	0.6
Uncertainty		1.1	0.0	0.7	0.2	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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Supplementary Material - C

TABLE C2- Standards concentrations from LA-ICP-MS analyses.

Sample: LMI-B1 (ol) 22/01/18										
Standard		Er	Tm	Yb	Lu	Hf	Ta	Pb	Th	U
BHVO-2G	Primary	2.4	0.3	1.9	0.3	4.2	1.1	1.6	1.2	0.4
BHVO-2G	Primary	2.7	0.4	2.2	0.3	4.4	1.2	1.8	1.3	0.4
BHVO-2G	Primary	2.7	0.3	2.0	0.3	4.4	1.1	1.6	1.2	0.4
BHVO-2G	Primary	2.5	0.4	1.9	0.3	4.3	1.2	1.7	1.2	0.4
BHVO-2G	Primary	2.6	0.3	2.1	0.3	4.3	1.1	1.8	1.2	0.4
Average		**2.6**	**0.3**	**2.0**	**0.3**	**4.3**	**1.2**	**1.7**	**1.2**	**0.4**
SD		0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0
GeoRem		2.6	0.3	2.0	0.3	4.3	1.2	1.7	1.2	0.4
Uncertainty		0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.1	0.0
Standard										
Nist-610	Secundary	516.1	519.9	530.4	504.0	479.3	522.7	378.1	515.4	480.9
Detection limit		**0.0**	**0.0**	**0.1**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**
GeoRem		455.0	435.0	450.0	439.0	435.0	446.0	426.0	457.2	461.5
Uncertainty		14.0	10.0	9.0	8.0	12.0	33.0	1.0	1.0	1.0
Sample: LMI-C2 (ol) 22/01/18										
Standard		Er	Tm	Yb	Lu	Hf	Ta	Pb	Th	U
BHVO-2G	Primary	2.5	0.3	2.0	0.3	4.0	1.2	1.6	1.2	0.4
BHVO-2G	Primary	2.6	0.4	2.0	0.3	4.7	1.1	1.8	1.2	0.4
BHVO-2G	Primary	2.5	0.3	1.9	0.3	4.2	1.1	1.7	1.2	0.4
BHVO-2G	Primary	2.6	0.4	2.2	0.3	4.4	1.2	1.7	1.3	0.4
Mean		**2.6**	**0.3**	**2.0**	**0.3**	**4.3**	**1.2**	**1.7**	**1.2**	**0.4**
SD		0.1	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0
GeoRem		2.6	0.3	2.0	0.3	4.3	1.2	1.7	1.2	0.4
Uncertainty		0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.1	0.0
Standard										
Nist-610	Secundary	514.8	541.3	510.4	521.1	465.3	504.0	372.0	506.9	482.9
Detection limit		**0.0**	**0.0**	**0.1**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**
GeoRem		455.0	435.0	450.0	439.0	435.0	446.0	426.0	457.2	461.5
Uncertainty		14.0	10.0	9.0	8.0	12.0	33.0	1.0	1.0	1.0

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OXYGEN FUGACITY OF THE ALTO PARANAÍBA KIMBERLITES AND DIAMOND INSTABILITY: TRÊS RANCHOS IV AND LIMEIRA I INTRUSIONS
Bruna Coldebella, Rogério Guitarrari Azzone, Luanna Chmyz, Excelso Ruberti, Darcy P. Svisero

Supplementary Material - C

TABLE C2- Standards concentrations from LA-ICP-MS analyses.

Sample: TRIV-5 (ol) 22/01/18										
Standard		Er	Tm	Yb	Lu	Hf	Ta	Pb	Th	U
BHVO-2G	Primary	2.5	0.3	2.0	0.3	4.3	1.2	1.8	1.2	0.4
BHVO-2G	Primary	2.6	0.4	2.0	0.3	4.4	1.1	1.7	1.2	0.4
BHVO-2G	Primary	2.6	0.3	2.0	0.3	4.4	1.1	1.6	1.2	0.4
BHVO-2G	Primary	2.4	0.4	1.9	0.3	4.2	1.2	1.6	1.2	0.4
BHVO-2G	Primary	2.7	0.4	2.1	0.3	4.4	1.1	1.8	1.2	0.5
Mean		**2.6**	**0.3**	**2.0**	**0.3**	**4.3**	**1.2**	**1.7**	**1.2**	**0.4**
SD		0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0
GeoRem		2.6	0.3	2.0	0.3	4.3	1.2	1.7	1.2	0.4
Uncertainty		0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.1	0.0
Standard										
Nist-610	Secundary	513.3	515.6	509.8	502.2	446.3	508.7	380.9	500.5	482.2
Detection limit		**0.0**	**0.0**	**0.1**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**
GeoRem		455.0	435.0	450.0	439.0	435.0	446.0	426.0	457.2	461.5
Uncertainty		14.0	10.0	9.0	8.0	12.0	33.0	1.0	1.0	1.0
Sample: TRIV-5-3 (ol) 22/01/18										
Standard		Er	Tm	Yb	Lu	Hf	Ta	Pb	Th	U
BHVO-2G	Primary	2.7	0.3	2.0	0.3	4.4	1.2	1.7	1.2	0.4
BHVO-2G	Primary	2.5	0.3	2.1	0.3	4.3	1.1	1.7	1.2	0.5
BHVO-2G	Primary	2.5	0.3	1.9	0.3	4.2	1.1	1.6	1.2	0.4
BHVO-2G	Primary	2.5	0.3	2.1	0.3	4.2	1.1	1.6	1.2	0.4
BHVO-2G	Primary	2.7	0.3	2.0	0.3	4.5	1.2	1.8	1.3	0.4
Mean		**2.6**	**0.3**	**2.0**	**0.3**	**4.3**	**1.2**	**1.7**	**1.2**	**0.4**
SD		0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0
GeoRem		2.6	0.3	2.0	0.3	4.3	1.2	1.7	1.2	0.4
Uncertainty		0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.1	0.0
Standard										
Nist-610	Secundary	503.2	498.1	493.3	488.4	481.4	505.5	421.2	498.6	456.5
Detection limit		**0.1**	**0.0**	**0.1**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**
GeoRem		455.0	435.0	450.0	439.0	435.0	446.0	426.0	457.2	461.5
Uncertainty		14.0	10.0	9.0	8.0	12.0	33.0	1.0	1.0	1.0

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Supplementary Material - C

TABLE C2- Standards concentrations from LA-ICP-MS analyses.

Sample: LMI-C2 (pv) 22/01/18												
Standard		Er166	Tm169	Yb173	Lu175	Hf178	Ta181	Pb206	Pb207	Pb208	Th232	U238
Nist-610	Primary	418.9	414.5	444.5	425.6	406.9	369.0	416.4	413.2	417.0	454.5	467.4
Nist-610	Primary	435.7	428.8	476.1	446.3	428.0	378.2	401.2	406.6	402.6	441.6	445.0
Nist-610	Primary	425.9	419.0	473.6	436.4	423.3	388.3	427.5	424.3	422.9	456.4	457.0
Nist-610	Primary	389.8	394.3	430.6	409.5	410.1	352.2	371.4	366.3	350.8	395.2	402.7
Nist-610	Primary	425.6	420.4	454.0	433.1	413.9	369.9	406.2	407.6	408.4	447.6	457.9
Mean		**419.2**	**415.4**	**455.8**	**430.2**	**416.5**	**371.5**	**404.5**	**403.6**	**400.3**	**439.1**	**446.0**
SD		15.6	11.5	17.3	12.3	8.0	11.9	18.9	19.7	25.7	22.5	22.8
GeoRem		455.0	435.0	450.0	439.0	435.0	446.0	426.0	457.2	461.5		
Uncertainty		14.0	10.0	9.0	8.0	12.0	33.0	1.0	1.0	1.0		
Standard												
BHVO-2G	Secundary	2.6	0.3	1.8	0.3	4.2	0.9	2.0	1.3	1.8	1.0	0.3
Detection limit		**0.2**	**0.0**	**0.4**	**0.1**	**0.2**	**0.0**	**0.3**	**0.3**	**0.2**	**0.0**	**0.0**
GeoRem		2.6	0.3	2.0	0.3	4.3	1.2	1.7	1.2	0.4		
Uncertainty		0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.1	0.0		

Sample: TRIV-5 (pv) 22/01/18												
Standard		Er166	Tm169	Yb173	Lu175	Hf178	Ta181	Pb206	Pb207	Pb208	Th232	U238
Nist-610	Primary	405.4	401.6	438.7	421.4	404.7	368.6	398.5	398.9	403.5	445.2	451.0
Nist-610	Primary	465.4	457.1	506.6	462.7	442.2	394.1	439.2	439.1	432.1	462.2	469.7
Nist-610	Primary	421.9	413.2	443.3	415.8	403.4	357.9	404.6	400.4	398.9	435.9	442.9
Nist-610	Primary	427.2	424.7	477.6	454.9	431.0	397.8	419.8	424.5	427.6	466.3	472.0
Mean		**430.0**	**424.1**	**466.6**	**438.7**	**420.3**	**379.6**	**415.5**	**415.7**	**415.5**	**452.4**	**458.9**
SD		22.0	20.7	27.6	20.4	16.8	16.8	15.7	16.9	14.5	12.4	12.3
GeoRem		455.0	435.0	450.0	439.0	435.0	446.0	426.0	457.2	461.5		
Uncertainty		14.0	10.0	9.0	8.0	12.0	33.0	1.0	1.0	1.0		
Standard												
BHVO-2G	Secundary	2.0	0.4	2.3	0.4	4.9	1.0	2.2	1.8	1.8	1.4	0.6
Detection limit		**0.2**	**0.0**	**0.3**	**0.0**	**0.1**	**0.1**	**0.4**	**0.5**	**0.2**	**0.0**	**0.0**
GeoRem		2.6	0.3	2.0	0.3	4.3	1.2	1.7	1.2	0.4		
Uncertainty		0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.1	0.0		

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Supplementary Material - A3

TABLE A3(2)- Standards concentrations from LA-ICP-MS analyses.

Sample: LMI-C2 (pv) 22/01/18												
Sample: TRIV-5-3 (pv) 22/01/18												
Standard		Er166	Tm169	Yb173	Lu175	Hf178	Ta181	Pb206	Pb207	Pb208	Th232	U238
Nist-610	Primary	445.0	432.5	476.8	451.4	441.2	395.9	428.9	430.1	417.7	461.8	467.6
Nist-610	Primary	409.2	408.9	447.3	420.0	397.4	360.1	398.9	397.8	409.0	440.1	447.2
Nist-610	Primary	425.9	423.8	477.6	452.8	444.5	399.5	442.2	425.5	447.5	479.4	502.1
Nist-610	Primary	428.2	421.5	463.3	436.6	420.5	378.9	415.2	415.4	413.9	452.1	458.5
Mean		**427.1**	**421.7**	**466.3**	**440.2**	**425.9**	**383.6**	**421.3**	**417.2**	**422.0**	**458.3**	**468.8**
SD		12.7	8.4	12.3	13.3	18.9	15.7	16.1	12.4	15.0	14.4	20.5
GeoRem		455.0	435.0	450.0	439.0	435.0	446.0	426.0	457.2	461.5		
Uncertainty		14.0	10.0	9.0	8.0	12.0	33.0	1.0	1.0	1.0		
Standard												
BHVO-2G	Secundary	2.8	0.3	2.5	0.2	5.2	1.1	1.7	2.0	2.3	1.2	0.4
Detection limit		**0.1**	**0.0**	**0.3**	**0.0**	**0.3**	**0.1**	**0.3**	**0.4**	**0.3**	**0.1**	**0.0**
GeoRem		2.6	0.3	2.0	0.3	4.3	1.2	1.7	1.2	0.4		
Uncertainty		0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.1	0.0		
Sample: LMI-C1 (ol) 23/01/18												
Standard		Er	Tm	Yb	Lu	Hf	Ta	Pb	Th	U		
BHVO-2G	Primary	2.6	0.3	1.9	0.3	4.5	1.1	1.8	1.2	0.4		
BHVO-2G	Primary	2.5	0.4	2.1	0.3	4.2	1.1	1.6	1.3	0.4		
BHVO-2G	Primary	2.5	0.3	2.0	0.3	4.3	1.1	1.7	1.2	0.4		
BHVO-2G	Primary	2.6	0.4	2.0	0.3	4.5	1.1	1.7	1.2	0.4		
Mean		**2.6**	**0.3**	**2.0**	**0.3**	**4.4**	**1.1**	**1.7**	**1.2**	**0.4**		
SD		0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0		
GeoRem		2.6	0.3	2.0	0.3	4.3	1.2	1.7	1.2	0.4		
Uncertainty		0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.1	0.0		
Standard												
Nist-610	Secundary	516.0	516.5	496.0	510.7	450.6	517.3	429.5	494.2	443.2		
Detection limit		**0.0**	**0.0**	**0.1**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**		
GeoRem		455.0	435.0	450.0	439.0	435.0	446.0	426.0	457.2	461.5		
Uncertainty		14.0	10.0	9.0	8.0	12.0	33.0	1.0	1.0	1.0		
Standard												
BIR	Secundary	1.6	0.3	1.8	0.3	0.6	0.0	3.4	0.0	0.0		
Detection limit		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**		
GeoRem		1.7	0.3	1.6	0.2	0.6	0.0	3.0	0.0	0.0		
Uncertainty		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

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Supplementary Material - C

Table C3. Trace element concentration, limit of detection and uncertanties (2-sigma error) of olivine from TR-IV and LM-I. C - core; R - rim; I - intermediate; LOD - limit of detection; b.d - below detection.

Sample Grain/Analyses Location	LMI-B1 01/01 R	2σ error 01/01 R	LOD 01/01 R	LMI-B1 01/02 C	2σ error 01/02 C	LOD 01/02 C	LMI-B1 02/03 R	2σ error 02/03 R	LOD 02/03 R	LMI-B1 02/04 C	2σ error 02/04 C	LOD 02/04 C	LMI-B1 03/05 R	2σ error 03/05 R	LOD 03/05 R	LMI-B1 03/06 C	2σ error 03/06 C
Li		0.60	0.14	1.09	0.26	0.12	1.87	0.40	0.14	1.39	0.42	0.15	1.69	0.38	0.14	0.63	0.62
Na	38.88	5.50	1.23	34.07	3.54	1.09	17.84	2.66	1.13	12.61	2.90	1.39	28.24	3.42	1.21	74.86	9.96
Al	108.15	9.68	0.32	6.21	0.80	0.28	1.03	0.56	0.30	1.24	0.76	0.36	7.34	1.04	0.33	63.92	7.56
P	b.d	26.10	9.26	b.d	11.50	8.52	b.d	14.98	8.75	b.d	19.68	10.74	b.d	14.68	9.23	b.d	36.16
Ca	b.d	409.72	160.66	b.d	183.96	141.02	b.d	233.88	145.10	b.d	301.20	177.14	b.d	223.76	153.11	b.d	516.26
Sc	2.79	0.58	0.08	2.60	0.28	0.07	2.13	0.32	0.07	2.12	0.38	0.09	2.55	0.32	0.07	2.79	0.76
Ti	17.11	5.72	0.39	15.87	2.54	0.25	16.24	3.28	0.29	19.25	4.38	0.30	17.00	3.12	0.31	5.89	4.44
V	3.51	0.68	0.07	1.18	0.19	0.06	1.08	0.22	0.06	0.94	0.26	0.08	3.42	0.40	0.07	0.63	0.42
Cr	33.79	3.62	0.38	20.92	1.94	0.33	23.72	2.32	0.35	21.08	2.28	0.42	77.86	7.12	0.37	22.84	3.32
Mn	1254.86	94.08	0.19	1308.30	97.24	0.17	942.74	71.06	0.18	859.33	65.92	0.22	1197.92	92.86	0.19	1161.18	94.10
Co	136.00	12.52	0.01	122.74	10.90	0.02	129.84	11.82	0.01	123.36	11.60	0.02	134.22	12.74	0.02	122.08	12.86
Ni	2476.16	173.98	0.05	2380.27	159.72	0.06	2817.17	191.28	0.09	2687.29	185.64	0.11	2932.25	201.36	0.12	2875.05	214.54
Cu	0.52	0.40	0.06	0.76	0.20	0.05	b.d	0.10	0.05	b.d	0.13	0.05	0.70	0.24	0.06	1.55	0.86
Zn	103.17	15.26	0.32	82.70	10.10	0.27	49.40	6.92	0.29	40.61	6.54	0.37	87.49	11.70	0.30	70.53	14.10
Sr	b.d	0.07	0.01	0.05	0.03	0.01	0.50	0.12	0.00	b.d	0.01	0.01	0.12	0.05	0.01	2.11	0.56
Y	b.d	0.05	0.01	b.d	0.01	0.01	b.d	0.03	0.01	b.d	0.00	0.01	0.01	0.01	0.00	b.d	0.00
Zr	0.19	0.17	0.02	0.15	0.06	0.01	0.06	0.05	0.01	b.d	0.05	0.02	0.17	0.08	0.01	0.35	0.30
Nb	1.48	0.38	0.00	1.14	0.16	0.00	4.50	0.52	0.01	4.89	0.62	0.01	1.30	0.20	0.01	1.22	0.44
Ba	b.d	0.36	0.04	b.d	0.12	0.05	0.36	0.26	0.05	b.d	0.13	0.06	b.d	0.19	0.07	5.17	2.20
La	b.d	0.00	0.01	b.d	0.01	0.00	0.05	0.03	0.00	b.d	0.01	0.01	0.02	0.02	0.01	b.d	0.05
Ce	b.d	0.01	0.01	b.d	0.01	0.01	b.d	0.01	0.01	b.d	0.02	0.01	b.d	0.01	0.01	b.d	0.08

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Supplementary Material - C

Table C3. Trace element concentration, limit of detection and uncertanties (2-sigma error) of olivine from TR-IV and LM-I. C - core; R - rim; I - intermediate; LOD - limit of detection; b.d - below detection.

Sample	LOD	LMI-B1	2σ error	LOD	LMI-B1	2σ error	LOD	LMI-B1	2σ error	LOD	LMI-B1	2σ error	LOD	LMI-C1	2σ error	LOD	LMI-C1
Grain/Analyses	03/06	04/07	04/07	04/07	04/08	04/08	04/08	05/09	05/09	05/09	05/10	05/10	05/10	06/11	06/11	06/11	06/12
Location	C	R	R	R	C	C	C	R	R	R	C	C	C	R	R	R	C
Li	0.15	1.83	0.42	0.22	b.d	0.38	0.12	1.85	0.80	0.13	1.70	0.44	0.12	2.21	0.54	0.09	1.84
Na	1.26	56.35	6.56	1.82	38.46	5.86	1.12	110.52	14.50	1.13	49.46	6.44	1.09	30.91	4.00	1.19	485.21
Al	0.33	5.61	0.92	0.47	12.77	2.26	0.30	38.39	5.32	0.29	20.58	2.38	0.28	7.21	1.36	0.33	34.28
P	9.78	128.77	25.80	14.16	b.d	23.62	8.62	b.d	31.94	8.82	b.d	16.28	8.37	b.d	20.54	9.74	b.d
Ca	157.45	b.d	257.30	223.75	561.26	378.58	138.37	b.d	454.62	139.07	511.79	243.28	131.38	b.d	306.92	152.09	b.d
Sc	0.08	2.30	0.30	0.11	2.39	0.54	0.07	2.73	0.72	0.07	2.06	0.34	0.06	1.78	0.38	0.07	2.00
Ti	0.32	116.17	11.46	0.58	11.07	4.48	0.30	8.14	4.90	0.27	6.80	2.30	0.28	102.40	13.14	0.35	91.32
V	0.07	3.31	0.40	0.10	1.90	0.48	0.06	4.72	0.98	0.06	3.95	0.54	0.05	2.12	0.40	0.06	1.78
Cr	0.38	107.82	10.88	0.54	31.58	3.90	0.34	129.97	14.84	0.34	141.65	15.78	0.33	44.85	3.78	0.38	44.00
Mn	0.19	1181.98	99.60	0.28	968.53	84.64	0.17	1004.68	90.84	0.18	960.67	87.66	0.17	1286.33	90.54	0.20	1235.94
Co	0.01	140.47	15.02	0.02	118.78	13.56	0.01	122.01	14.72	0.01	120.97	14.46	0.02	123.92	8.38	0.01	141.63
Ni	0.10	3112.21	222.84	0.19	2728.01	205.22	0.10	2727.36	213.76	0.12	2832.36	213.44	0.10	2753.53	193.12	0.13	3157.20
Cu	0.05	1.21	0.30	0.07	0.38	0.34	0.06	4.48	1.42	0.05	1.54	0.44	0.05	0.41	0.28	0.05	b.d
Zn	0.29	83.25	12.52	0.41	68.74	12.84	0.25	63.00	13.70	0.29	58.78	10.46	0.27	81.77	9.72	0.33	86.66
Sr	0.00	b.d	0.01	0.01	0.17	0.11	0.01	9.14	1.46	0.01	0.05	0.04	0.00	0.18	0.09	0.01	0.57
Y	0.00	b.d	0.02	0.01	b.d	0.05	0.01	b.d	0.08	0.01	0.03	0.03	0.01	b.d	0.00	0.01	0.05
Zr	0.01	0.40	0.12	0.02	b.d	0.13	0.01	1.14	0.50	0.02	0.34	0.14	0.01	0.32	0.17	0.01	0.67
Nb	0.01	0.16	0.06	0.01	1.98	0.44	0.01	3.02	0.70	0.01	0.34	0.11	0.01	0.76	0.20	0.01	0.96
Ba	0.08	b.d	0.11	0.09	1.22	0.80	0.07	38.24	7.06	0.06	b.d	0.14	0.06	b.d	0.26	0.06	1.17
La	0.01	b.d	0.01	0.01	b.d	0.05	0.01	0.66	0.26	0.01	b.d	0.02	0.01	b.d	0.03	0.01	0.07
Ce	0.01	b.d	0.02	0.01	b.d	0.03	0.01	1.33	0.38	0.01	b.d	0.01	0.01	0.05	0.05	0.01	0.05

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Supplementary Material - C

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Sample	2σ error	LOD	LMI-C1	2σ error	LOD	LMI-C1	2σ error	LOD	LMI-C2	2σ error	LOD	LMI-C2	2σ error	LOD	LMI-C2	2σ error	LOD
Grain/Analyses	06/12	06/12	07/13	07/13	07/13	07/14	07/14	07/14	08/15	08/15	08/15	08/16	08/16	08/16	09/17	09/17	09/17
Location	C	C	R	R	R	C	C	C	R	R	R	C	C	C	R	R	R
Li	0.46	0.15	1.58	0.52	0.07	1.87	0.34	0.10	1.22	0.46	0.09	1.34	0.26	0.08	0.98	0.52	0.07
Na	41.58	1.91	39.91	5.02	0.96	28.58	2.88	1.32	25.17	3.88	1.17	23.97	2.32	1.08	46.22	6.04	1.00
Al	3.08	0.53	5.98	1.44	0.27	75.70	5.16	0.37	12.38	2.06	0.31	3.19	0.58	0.29	23.83	3.66	0.27
P	23.14	15.87	b.d	20.86	8.03	b.d	10.14	10.71	b.d	23.74	9.67	b.d	11.04	8.68	46.05	35.76	8.73
Ca	349.08	249.43	b.d	316.14	121.08	b.d	155.04	169.06	b.d	302.82	127.95	b.d	144.10	115.33	b.d	379.84	112.44
Sc	0.36	0.12	2.48	0.52	0.06	2.70	0.26	0.08	2.13	0.50	0.07	2.65	0.34	0.06	1.78	0.60	0.06
Ti	10.86	0.64	63.18	11.24	0.34	57.36	5.30	0.42	9.98	4.24	0.36	6.66	1.64	0.27	61.93	14.46	0.19
V	0.34	0.10	1.63	0.42	0.05	1.92	0.19	0.06	1.02	0.36	0.06	1.14	0.19	0.06	4.21	0.92	0.05
Cr	3.60	0.62	21.87	2.38	0.31	21.86	1.72	0.42	21.34	2.42	0.37	19.97	1.74	0.34	81.96	7.86	0.31
Mn	87.56	0.42	1365.15	98.84	0.17	1434.91	103.66	0.23	1154.43	90.44	0.19	1113.55	88.46	0.18	1174.73	99.12	0.17
Co	9.34	0.11	117.67	8.30	0.01	131.65	8.42	0.01	121.85	12.68	0.01	125.09	13.08	0.01	126.00	14.78	0.02
Ni	220.52	1.41	2139.69	156.38	0.06	2486.40	174.68	0.14	2678.36	240.44	0.14	2822.44	255.48	0.18	2405.17	239.14	0.07
Cu	0.19	0.09	b.d	0.22	0.05	b.d	0.09	0.06	b.d	0.26	0.05	b.d	0.11	0.06	0.69	0.56	0.04
Zn	9.42	0.57	72.58	10.10	0.26	78.00	7.28	0.31	66.49	9.02	0.27	55.51	5.18	0.30	84.11	13.06	0.24
Sr	0.14	0.01	0.18	0.11	0.00	0.13	0.03	0.01	0.25	0.13	0.01	0.04	0.02	0.01	0.31	0.19	b.d
Y	0.04	0.01	b.d	0.00	0.01	b.d	0.01	0.01	b.d	0.00	0.01	b.d	0.01	0.01	b.d	0.05	0.01
Zr	0.20	0.02	0.23	0.17	0.01	0.28	0.06	0.02	0.50	0.24	0.01	0.08	0.05	0.01	0.30	0.26	0.02
Nb	0.20	0.01	1.88	0.40	0.01	2.33	0.24	0.01	0.82	0.26	0.01	1.21	0.17	0.01	1.82	0.50	0.01
Ba	0.52	0.09	0.50	0.48	0.05	b.d	0.08	0.10	b.d	0.22	0.07	0.15	0.12	0.04	b.d	0.36	0.06
La	0.04	0.01	b.d	0.03	0.00	b.d	0.01	0.01	b.d	0.00	0.01	b.d	0.01	0.01	b.d	0.00	0.01
Ce	0.04	0.01	b.d	0.00	0.01	b.d	0.01	0.01	b.d	0.05	0.01	b.d	0.01	0.01	b.d	0.00	0.01

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Supplementary Material - C

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Sample	LMI-C2	2σ error	LOD	TRIV-5	2σ error	LOD	TRIV-5	2σ error	LOD	TRIV-5	2σ error	LOD	TRIV-5	2σ error	LOD	TRIV-5	2σ error
Grain/Analyses	09/18	09/18	09/18	01/01	01/01	01/01	01/02	01/02	01/02	02/03	02/03	02/03	02/04	02/04	02/04	03/05	03/05
Location	C	C	C	R	R	R	C	C	C	R	R	R	C	C	C	R	R
Li	1.64	0.44	0.07	2.26	0.44	0.08	2.57	0.62	0.07	2.13	0.54	0.07	2.56	0.72	0.09	2.05	0.84
Na	40.13	4.10	1.02	63.57	5.16	1.08	57.51	5.50	0.95	53.52	5.14	0.99	55.08	6.12	1.26	61.15	8.12
Al	13.41	1.72	0.27	23.00	2.38	0.29	7.57	1.60	0.26	6.93	1.48	0.27	10.64	2.20	0.33	14.57	3.30
P	b.d	17.24	8.44	b.d	16.50	9.24	b.d	22.22	8.08	b.d	20.48	8.56	b.d	29.14	11.26	68.77	50.04
Ca	b.d	224.52	111.11	b.d	205.98	114.81	b.d	268.28	103.13	b.d	256.04	107.53	443.36	355.30	133.13	b.d	494.48
Sc	1.92	0.40	0.06	0.87	0.24	0.06	0.61	0.28	0.05	0.60	0.26	0.06	0.40	0.30	0.08	1.15	0.56
Ti	50.59	8.38	0.30	2.73	1.62	0.22	2.09	2.08	0.35	b.d	1.52	0.23	b.d	2.32	0.38	5.16	4.56
V	3.80	0.58	0.06	4.70	0.60	0.06	3.61	0.66	0.05	2.70	0.54	0.05	2.59	0.64	0.07	1.33	0.60
Cr	70.80	6.32	0.31	130.53	9.72	0.34	99.38	7.98	0.30	92.98	7.50	0.32	97.42	8.32	0.40	84.78	8.38
Mn	1264.57	109.52	0.17	937.92	69.54	0.18	884.59	66.92	0.16	854.59	65.42	0.17	940.80	73.88	0.21	1459.11	123.68
Co	134.73	16.10	0.01	141.41	15.82	0.02	124.08	14.46	0.01	125.32	14.94	0.01	141.45	17.60	0.02	134.57	19.24
Ni	2690.79	272.02	0.14	3209.11	308.52	0.17	2971.54	294.30	0.06	3067.45	309.60	0.10	3240.70	339.46	0.07	2555.60	303.04
Cu	0.72	0.34	0.05	0.37	0.22	0.04	b.d	0.24	0.05	1.04	0.48	0.03	1.16	0.64	0.06	0.67	0.66
Zn	88.22	9.70	0.23	60.77	7.16	0.29	53.59	8.20	0.25	46.43	7.22	0.26	63.63	10.40	0.33	97.36	16.78
Sr	0.10	0.06	0.01	0.70	0.17	0.01	0.14	0.10	0.01	0.13	0.09	0.01	0.13	0.11	0.01	0.43	0.26
Y	0.03	0.03	0.01	b.d	0.03	0.01	0.06	0.06	b.d	b.d	0.04	0.00	b.d	0.06	0.01	b.d	0.10
Zr	0.52	0.20	0.01	0.13	0.09	0.02	b.d	0.10	0.01	b.d	0.05	0.01	0.20	0.18	0.01	b.d	0.13
Nb	1.83	0.32	0.01	0.51	0.15	0.01	0.86	0.26	0.01	0.11	0.09	0.01	0.19	0.14	0.01	b.d	0.11
Ba	0.36	0.34	0.07	1.20	0.54	0.06	1.86	0.90	0.03	b.d	0.04	0.06	b.d	0.40	0.09	1.95	1.38
La	b.d	0.00	0.00	0.09	0.05	0.01	b.d	0.03	0.01	b.d	0.00	0.01	b.d	0.01	0.01	b.d	0.01
Ce	b.d	0.02	0.01	0.22	0.08	0.01	b.d	0.03	0.00	b.d	0.00	0.01	b.d	0.05	0.01	b.d	0.01

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Supplementary Material - C

Table C3. Trace element concentration, limit of detection and uncertanties (2-sigma error) of olivine from TR-IV and LM-I. C - core; R - rim; I - intermediate; LOD - limit of detection; b.d - below detection.

Sample	LOD	TRIV-5	2σ error	LOD	TRIV-5	2σ error	LOD	TRIV-5	2σ error	LOD	TRIV-5-3	2σ error	LOD	TRIV-5-3	2σ error	LOD	TRIV-5-3
Grain/Analyses	03/05	03/06	03/06	03/06	04/07	04/07	04/07	04/08	04/08	04/08	05/09	05/09	05/09	05/10	05/10	05/10	06/11
Location	R	C	C	C	R	R	R	C	C	C	R	R	R	C	C	C	R
Li	0.13	3.19	0.70	0.09	1.53	0.30	0.09	1.34	0.24	0.09	3.13	0.52	0.09	3.52	0.60	0.09	0.94
Na	1.70	81.34	7.30	1.22	14.32	2.00	1.13	18.70	2.00	1.26	298.26	19.06	0.97	319.52	20.56	0.95	26.78
Al	0.46	7.14	1.56	0.31	8.29	1.04	0.30	8.29	0.90	0.32	143.10	10.44	0.25	165.49	12.20	0.25	78.16
P	14.06	b.d	26.10	10.37	b.d	13.34	9.90	b.d	11.38	10.86	73.57	22.34	7.64	62.94	22.92	7.63	b.d
Ca	171.49	b.d	289.32	129.92	b.d	158.46	117.47	b.d	136.36	128.94	b.d	214.80	109.72	653.21	242.16	107.98	b.d
Sc	0.10	1.99	0.46	0.07	0.62	0.16	0.06	0.58	0.12	0.06	1.68	0.32	0.06	2.05	0.38	0.05	0.58
Ti	0.44	84.65	13.24	0.38	6.61	1.86	0.39	b.d	0.58	0.39	224.53	20.12	0.27	222.36	21.02	0.26	4.99
V	0.10	2.24	0.50	0.07	5.38	0.60	0.06	4.73	0.50	0.06	8.11	0.82	0.05	8.95	0.94	0.05	1.28
Cr	0.53	87.59	7.74	0.38	142.00	11.82	0.35	133.60	11.32	0.39	128.14	9.78	0.29	136.57	10.60	0.29	58.22
Mn	0.28	1616.63	138.10	0.20	810.96	70.74	0.19	782.88	70.26	0.20	1088.51	72.14	0.15	1111.99	74.26	0.15	737.12
Co	0.03	141.46	20.50	0.01	138.17	20.68	0.02	135.27	21.18	0.03	167.60	13.02	0.01	169.10	13.36	0.01	109.53
Ni	0.09	2729.85	327.36	0.16	3042.63	375.16	0.12	3143.08	403.14	0.17	2392.20	195.34	0.11	2431.98	202.24	0.09	2367.49
Cu	0.09	0.50	0.36	0.05	1.06	0.28	0.06	1.12	0.24	0.05	8.49	1.36	0.05	8.70	1.48	0.06	1.06
Zn	0.44	86.03	11.84	0.30	49.44	5.94	0.29	49.83	5.68	0.34	107.22	12.20	0.24	103.48	12.40	0.24	43.33
Sr	0.01	0.55	0.19	0.01	b.d	0.02	0.01	0.20	0.05	0.01	1.06	0.20	0.01	0.13	0.07	0.01	0.81
Y	0.01	0.01	0.03	0.01	b.d	0.01	0.01	b.d	0.00	0.00	b.d	0.02	0.00	b.d	0.03	0.01	b.d
Zr	0.02	0.57	0.26	0.01	b.d	0.02	0.01	b.d	0.02	0.02	0.55	0.19	0.01	0.14	0.10	0.01	b.d
Nb	0.01	2.14	0.42	0.01	b.d	0.02	0.00	b.d	0.01	0.00	0.15	0.08	0.01	0.05	0.05	0.01	b.d
Ba	0.11	1.46	0.78	0.08	b.d	0.08	0.05	b.d	0.06	0.05	2.42	0.74	0.03	b.d	0.22	0.04	2.05
La	0.01	b.d	0.03	0.01	b.d	0.01	0.01	b.d	0.01	0.01	0.17	0.07	0.01	b.d	0.02	0.00	0.12
Ce	0.02	b.d	0.02	0.01	b.d	0.01	0.01	b.d	0.01	0.00	0.32	0.09	0.00	b.d	0.00	0.01	b.d

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Supplementary Material - C

Table C3. Trace element concentration, limit of detection and uncertanties (2-sigma error) of olivine from TR-IV and LM-I. C - core; R - rim; I - intermediate; LOD - limit of detection; b.d - below detection.

Sample	2σ error	LOD	TRIV-5-3	2σ error	LOD	TRIV-5-3	2σ error	LOD	TRIV-5-3	2σ error	LOD	TRIV-5-3	2σ error	LOD	TRIV-5-3	2σ error	LOD
Grain/Analyses	06/11	06/11	06/12	06/12	06/12	07/13	07/13	07/13	07/14	07/14	07/14	08/15	08/15	08/15	08/16	08/16	08/16
Location	R	R	C	C	C	R	R	R	C	C	C	R	R	R	C	C	C
Li	0.66	0.12	1.37	0.26	0.09	1.02	0.42	0.09	1.33	0.44	0.09	0.78	0.38	0.10	0.60	0.24	0.11
Na	6.10	1.42	31.68	2.64	1.09	37.43	4.36	1.00	40.33	4.20	0.97	39.58	4.36	1.06	48.94	4.00	1.33
Al	8.86	0.36	7.39	0.90	0.29	11.00	1.98	0.27	8.51	1.58	0.26	21.93	2.82	0.29	28.08	2.64	0.36
P	44.00	12.33	b.d	11.54	9.36	b.d	24.20	8.50	b.d	21.78	8.22	b.d	22.04	8.56	b.d	17.16	11.30
Ca	548.24	165.55	b.d	158.96	124.69	b.d	306.84	116.59	b.d	274.08	113.05	b.d	305.90	124.66	1061.72	250.24	151.84
Sc	0.46	0.08	1.14	0.19	0.07	0.98	0.34	0.06	0.63	0.26	0.06	2.66	0.54	0.06	2.74	0.40	0.08
Ti	4.58	0.20	7.05	1.70	0.20	1.98	1.94	0.22	b.d	1.22	0.24	3.28	2.32	0.23	1.21	0.94	0.25
V	0.60	0.08	1.49	0.22	0.05	4.73	0.76	0.05	4.44	0.68	0.05	1.26	0.38	0.06	1.73	0.30	0.07
Cr	6.22	0.43	60.47	4.78	0.34	91.38	7.94	0.32	84.65	7.40	0.30	32.39	3.40	0.33	48.13	4.44	0.41
Mn	52.16	0.23	801.15	53.90	0.18	742.92	51.62	0.17	813.59	56.86	0.16	955.96	68.80	0.17	953.15	68.90	0.23
Co	10.18	0.02	128.74	10.32	0.01	120.97	10.50	0.01	129.74	11.32	0.01	135.10	12.48	0.02	149.07	13.74	0.02
Ni	214.48	0.15	2872.86	245.32	0.09	2601.43	234.60	0.13	2878.95	265.24	0.08	2734.17	270.12	0.10	3506.16	353.70	0.21
Cu	0.82	0.07	1.26	0.30	0.05	1.21	0.58	0.04	0.99	0.46	0.04	b.d	0.24	0.05	0.34	0.20	0.07
Zn	10.66	0.39	42.61	5.20	0.31	50.17	8.62	0.26	49.82	8.18	0.24	44.01	7.98	0.28	38.03	5.90	0.32
Sr	0.36	0.00	b.d	0.01	0.01	0.25	0.13	0.01	17.35	1.48	0.02	0.75	0.22	0.01	0.24	0.08	0.01
Y	0.00	0.01	b.d	0.00	0.00	b.d	0.00	0.01	b.d	0.05	0.01	b.d	0.03	0.01	b.d	0.01	0.01
Zr	0.01	0.02	b.d	0.02	0.01	0.24	0.18	0.01	b.d	0.07	b.d	0.13	0.12	0.01	b.d	0.02	0.01
Nb	0.01	0.01	0.04	0.03	0.01	0.18	0.12	0.01	b.d	0.00	0.00	b.d	0.06	0.01	b.d	0.02	0.01
Ba	1.48	0.06	b.d	0.12	0.07	0.51	0.50	0.05	1.90	0.84	0.06	2.43	1.00	0.03	b.d	0.05	0.09
La	0.13	0.01	0.01	0.01	0.00	b.d	0.00	0.00	b.d	0.02	0.01	b.d	0.02	0.01	b.d	0.02	0.01
Ce	0.09	0.01	b.d	0.01	0.01	b.d	0.00	0.01	0.07	0.06	0.01	b.d	0.05	0.01	0.05	0.03	0.01

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Supplementary Material - C

Table C4. Trace element concentration, limits of detection and uncertanties (2-sigma error) of perovskite from TR-IV and LM-I samples.

C - core region (average composition); LOD - limit of detection; b.d - below detection.

Sample	LMI-C2	2σ error	LOD	LMI-C2	2σ error	LOD	LMI-C2	2σ error	LOD	LMI-C2	2σ error	LOD	LMI-C2	2σ error	LOD
Grain/Analyses	01/01	01/01	01/01	02/02	02/02	02/02	03/03	03/03	03/03	04/04	04/04	04/04	05/05	05/05	05/05
Location	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Mg	9219.63	980.64	0.38	1530.24	166.46	0.38	6811.59	748.54	0.38	248.86	29.84	0.31	819.04	97.16	0.28
Al	367.23	37.06	1.13	319.63	31.94	1.25	818.72	79.24	1.29	275.26	28.24	1.05	391.51	40.62	0.98
Sc	5.83	1.14	0.19	5.27	0.96	0.21	21.05	2.46	0.24	3.76	0.78	0.19	4.54	0.98	0.18
V	144.21	22.82	0.27	130.40	20.88	0.32	269.38	43.78	0.29	113.56	19.40	0.21	118.09	21.14	0.23
Mn	221.60	44.32	0.79	219.59	44.68	0.87	961.66	200.22	0.94	132.91	29.04	0.73	190.02	43.20	0.70
Fe	10924.46	2329.02	5.77	9768.59	2117.38	6.23	68475.43	15222.16	6.63	7503.51	1721.82	5.29	10863.76	2586.42	4.95
Sr	3336.73	661.04	0.11	3124.18	631.70	0.03	2930.42	610.68	0.06	2841.73	614.06	0.04	2921.37	658.32	0.05
Y	332.13	60.80	0.05	393.11	73.20	0.04	377.69	72.46	0.03	290.18	57.70	0.02	294.79	61.14	0.03
Zr	1291.36	257.28	0.35	1240.11	252.10	0.22	2122.53	444.48	0.26	906.97	198.08	0.17	849.62	194.36	0.21
Nb	4736.98	644.70	0.17	5178.63	716.40	0.02	7207.96	1023.66	0.10	4789.32	702.02	0.04	3860.21	587.62	0.05
Ba	31.96	8.78	0.26	20.12	5.78	0.24	16.63	5.24	0.39	17.10	5.22	0.29	20.39	6.52	0.14
La	8686.76	1479.80	0.27	10516.87	1833.46	0.04	10626.62	1913.84	0.07	10534.31	1971.22	0.05	8189.69	1601.44	0.08
Ce	22978.16	4175.06	0.55	28511.54	5303.34	0.04	29099.32	5593.12	0.08	30563.22	6106.54	0.10	24145.33	5042.96	0.16
Pr	3250.54	604.86	0.20	3913.39	746.24	0.02	3832.44	755.98	0.04	4182.15	858.42	0.03	3506.55	753.22	0.06
Nd	12462.24	2012.10	1.12	14642.16	2420.80	0.29	13847.76	2368.52	0.29	16894.11	3005.32	0.30	14508.41	2701.46	0.38
Sm	1563.64	221.78	0.50	1729.42	249.16	0.15	1539.25	228.88	0.21	1868.77	287.00	0.19	1635.85	262.56	0.16
Eu	346.12	34.28	0.12	362.07	36.06	0.05	315.67	32.30	0.07	365.46	38.16	0.05	353.77	38.36	0.05
Gd	786.63	62.02	0.46	802.06	62.60	0.13	675.59	53.98	0.15	787.42	63.00	0.12	713.45	59.08	0.12
Tb	73.52	6.34	0.07	67.06	5.72	0.03	58.87	5.16	0.02	66.13	5.80	0.02	57.81	5.32	0.02
Dy	245.19	19.02	0.35	229.31	17.14	0.11	204.59	15.76	0.15	208.56	15.74	0.09	189.12	15.18	0.13
Ho	25.66	2.66	0.05	25.71	2.56	0.02	24.36	2.50	0.03	21.71	2.26	0.02	19.54	2.20	0.02
Er	37.04	3.96	0.11	41.57	4.00	0.08	41.03	4.06	0.07	33.01	3.34	0.08	29.84	3.36	0.06
Tm	3.15	0.54	0.02	3.15	0.48	0.02	3.16	0.48	0.03	2.11	0.36	0.02	1.86	0.38	0.01
Yb	11.42	2.68	0.16	12.35	2.48	0.15	14.04	2.80	0.15	7.93	1.86	0.14	8.43	2.18	0.15
Lu	0.88	0.28	0.02	1.23	0.28	0.01	0.99	0.26	0.03	0.76	0.22	0.02	0.71	0.24	0.02
Hf	59.89	7.02	0.16	63.44	6.88	0.07	93.61	9.74	0.15	45.39	5.32	0.14	43.77	5.62	0.09
Ta	557.86	50.14	0.27	703.33	63.58	0.02	416.05	38.58	0.03	994.91	93.60	0.03	870.91	84.50	0.12
Pb	31.75	4.02	0.14	33.90	3.90	0.12	37.21	4.30	0.11	81.88	8.18	0.05	60.09	6.66	0.12
Th	2114.28	154.62	0.77	2314.00	169.34	0.02	1931.47	143.22	0.03	7838.06	585.14	0.06	5195.31	395.16	0.57
U	189.31	15.78	0.19	241.60	19.80	b.d	134.41	11.46	0.01	217.50	18.36	0.01	172.09	15.10	0.12

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Sample	LMI-C2	2σ error	LOD	LMI-C2	2σ error	LOD	LMI-C2	2σ error	LOD	LMI-C2	2σ error	LOD	LMI-C2	2σ error	LOD
Grain/Analyses	06/06	06/06	06/06	07/07	07/07	07/07	08/08	08/08	08/08	09/09	09/09	09/09	10/10	10/10	10/10
Location	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Mg	228.01	31.58	0.28	284.49	40.96	0.26	701.17	98.64	0.51	414.02	61.10	0.37	1387.47	207.62	0.29
Al	205.97	24.00	1.22	289.38	34.26	1.08	266.29	31.26	0.98	209.29	25.48	1.06	229.00	28.16	0.99
Sc	6.85	1.32	0.24	9.00	1.74	0.21	4.32	1.00	0.19	3.64	0.88	0.19	5.14	1.06	0.19
V	153.18	31.14	0.30	144.24	31.02	0.21	129.67	29.00	0.23	137.94	32.24	0.24	132.31	32.36	0.22
Mn	153.26	40.14	0.85	145.34	40.10	0.76	152.31	43.82	0.70	172.67	51.96	0.74	173.49	54.62	0.68
Fe	9217.09	2487.82	5.88	11400.31	3215.90	5.20	8906.89	2623.08	4.78	8345.01	2565.30	4.97	7763.10	2488.84	4.66
Sr	3087.88	799.76	0.03	3888.94	1056.96	0.03	3201.86	911.84	0.04	3177.16	947.70	0.04	2437.82	760.84	0.04
Y	343.49	81.58	0.02	432.23	107.66	b.d	309.22	80.64	0.02	347.36	94.76	0.02	318.05	90.72	0.03
Zr	1836.10	483.20	0.22	2207.42	611.00	0.08	1004.78	292.48	0.19	1432.34	436.82	0.22	1166.80	373.16	0.19
Nb	7885.10	1359.92	0.03	10141.74	1828.72	0.07	4535.48	853.24	0.03	5607.11	1100.60	0.04	5149.99	1053.98	0.05
Ba	20.29	7.16	0.12	23.30	8.78	0.22	13.06	5.30	0.25	16.73	6.54	0.17	11.88	5.04	0.16
La	12664.83	2865.92	0.04	15314.18	3647.02	0.07	10294.13	2576.28	0.06	10948.69	2879.26	0.05	8906.64	2458.98	0.07
Ce	36864.10	8919.94	0.06	41712.41	10623.44	0.11	30294.74	8110.00	0.09	30162.46	8485.38	0.11	26218.47	7743.40	0.11
Pr	5111.41	1276.28	0.04	5133.87	1350.98	0.04	4207.20	1165.24	0.04	4134.08	1204.86	0.04	3438.42	1053.56	0.05
Nd	19520.27	4222.46	0.40	21113.63	4813.50	0.24	16342.56	3919.92	0.32	16448.37	4150.78	0.32	13709.46	3636.66	0.28
Sm	2270.27	416.90	0.26	2294.09	442.86	0.18	1802.74	364.20	0.14	1864.02	394.38	0.18	1532.60	339.66	0.20
Eu	460.83	55.52	0.06	462.90	58.36	0.06	354.10	46.28	0.04	386.29	52.46	0.05	330.09	46.72	0.05
Gd	947.58	83.02	0.13	1050.98	95.38	0.13	776.73	71.80	0.11	846.67	79.96	0.11	678.51	66.08	0.12
Tb	83.38	8.10	0.03	87.59	8.88	0.02	66.94	6.92	0.02	74.50	7.86	0.02	61.16	6.68	0.02
Dy	269.14	21.18	0.16	288.97	23.74	0.08	207.13	16.94	0.11	256.68	20.46	0.11	223.08	18.08	0.09
Ho	29.51	3.42	0.03	32.16	3.92	0.02	24.18	3.00	0.02	27.54	3.46	0.02	22.88	3.00	0.02
Er	44.88	4.84	0.05	52.50	5.94	0.06	38.19	4.32	0.06	44.68	4.92	0.06	41.42	4.64	0.05
Tm	3.16	0.54	0.02	3.41	0.64	0.02	3.10	0.52	0.02	3.12	0.52	0.01	3.00	0.50	0.02
Yb	14.37	3.24	0.13	15.79	3.86	0.09	9.89	2.54	0.16	11.70	2.82	0.14	13.15	3.04	0.07
Lu	1.27	0.34	0.03	1.16	0.38	0.03	1.16	0.32	0.02	0.93	0.26	0.01	1.00	0.28	0.02
Hf	103.85	12.16	0.13	129.00	15.70	0.07	61.41	8.10	0.08	70.97	9.28	0.05	63.14	8.54	0.06
Ta	900.28	96.20	0.03	801.86	89.20	0.03	1035.40	118.70	0.04	679.43	80.88	0.03	590.77	72.96	0.04
Pb	61.18	7.24	0.09	49.28	6.56	0.10	77.75	9.24	0.06	45.02	5.84	0.07	42.74	5.66	0.06
Th	5133.68	413.12	b.d	3945.71	326.36	0.04	6773.23	568.84	0.09	3400.31	292.36	0.06	3852.60	338.86	0.11
U	159.49	15.08	b.d	182.34	17.86	b.d	195.11	19.20	0.01	241.19	24.22	0.01	147.22	15.36	0.02

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OXYGEN FUGACITY OF THE ALTO PARANAÍBA KIMBERLITES AND DIAMOND INSTABILITY: TRÊS RANCHOS IV AND LIMEIRA I INTRUSIONS
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Supplementary Material - C

Table C4. Trace element concentration, limits of detection and uncertanties (2-sigma error) of perovskite from TR-IV and LM-I samples.

C - core region (average composition); LOD - limit of detection; b.d - below detection.

Sample	LMI-C2	2σ error	LOD	TRIV-5	2σ error	LOD	TRIV-5	2σ error	LOD	TRIV-5	2σ error	LOD	TRIV-5-3	2σ error	LOD
Grain/Analyses	11/11	11/11	11/11	01/01	01/01	01/01	02/02	02/02	02/02	03/03	03/03	03/03	04/04	04/04	04/04
Location	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Mg	2182.95	337.28	0.46	771.16	128.92	0.35	875.84	152.28	0.35	2022.66	392.06	0.52	4005.62	405.04	0.26
Al	523.07	62.54	1.15	199.22	35.14	1.00	313.65	56.36	1.14	236.93	47.56	1.21	620.84	63.22	1.03
Sc	3.05	0.72	0.22	6.38	1.62	0.18	4.66	1.34	0.21	4.28	1.28	0.24	9.22	1.22	0.18
V	117.72	30.04	0.30	38.46	8.28	0.23	37.65	8.44	0.26	43.39	10.66	0.27	37.06	3.66	0.27
Mn	156.52	51.46	0.79	91.09	17.38	0.72	164.83	32.30	0.76	252.99	55.76	0.85	198.28	14.70	0.68
Fe	7358.99	2457.48	5.29	8993.24	874.24	4.63	9828.50	982.78	5.25	8307.99	904.22	5.60	11549.50	1354.20	5.28
Sr	2528.02	824.22	0.05	6112.51	1343.90	0.03	6815.82	1577.70	0.06	6205.63	1646.60	0.06	6623.87	484.48	0.04
Y	262.23	78.08	0.03	185.61	42.86	0.03	235.20	56.96	0.03	217.08	60.04	0.02	199.14	20.62	0.03
Zr	890.01	297.88	0.22	1485.25	252.80	0.22	1177.58	210.82	0.26	813.87	166.04	0.32	2151.43	172.36	0.18
Nb	3940.22	839.58	0.03	11720.19	2087.66	0.02	9184.22	1717.88	0.07	7316.96	1560.04	0.07	11794.30	1110.64	0.05
Ba	27.09	10.10	0.32	83.06	17.92	0.15	110.66	23.70	0.25	70.37	17.08	0.24	290.17	44.52	0.18
La	9079.98	2628.22	0.06	25408.83	3496.78	0.02	24859.72	3561.10	0.11	22397.19	3590.66	0.12	21709.87	3883.70	0.06
Ce	27453.06	8500.48	0.07	53633.45	5668.94	0.03	52774.90	5765.30	0.19	50530.84	6078.84	0.13	45697.62	6756.08	0.09
Pr	3848.53	1238.04	0.03	5262.64	781.34	0.02	5304.20	820.42	0.07	5653.26	980.54	0.05	4779.28	705.64	0.03
Nd	15731.23	4379.74	0.31	18143.84	2708.94	0.28	20046.45	3121.20	0.48	19790.77	3464.80	0.35	17839.40	2401.04	0.21
Sm	1739.55	402.48	0.21	1615.06	210.06	0.18	1729.38	233.74	0.26	1806.90	272.42	0.15	1553.68	157.98	0.15
Eu	354.72	52.02	0.04	309.68	44.48	0.05	357.17	53.28	0.05	340.16	56.68	0.05	295.86	43.54	0.04
Gd	760.78	75.20	0.15	774.80	91.10	0.14	885.74	107.68	0.16	794.49	107.02	0.14	687.93	116.44	0.11
Tb	65.30	7.24	0.03	54.79	7.12	0.02	63.82	8.52	0.03	56.70	8.32	0.03	48.65	7.86	0.02
Dy	204.14	16.22	0.10	155.33	28.60	0.11	192.96	36.72	0.11	170.52	36.38	0.11	148.48	20.52	0.10
Ho	23.10	3.04	0.02	14.63	2.54	0.02	18.32	3.22	0.02	15.69	3.04	0.03	14.50	2.02	0.01
Er	36.60	4.04	0.05	23.72	4.54	0.08	28.25	5.44	0.04	28.51	5.92	0.09	27.72	3.80	0.05
Tm	2.57	0.40	0.02	1.52	0.42	0.02	1.74	0.46	0.03	1.59	0.42	0.03	1.38	0.30	0.01
Yb	9.81	2.28	0.13	4.67	1.82	0.10	6.44	2.24	0.13	7.40	2.44	0.18	6.83	1.64	0.11
Lu	0.67	0.19	0.02	0.53	0.24	0.02	0.61	0.26	0.02	0.62	0.24	0.03	0.51	0.18	0.02
Hf	53.82	7.28	0.09	68.71	11.00	0.10	53.13	9.06	0.10	40.99	7.66	0.08	93.90	13.72	0.07
Ta	841.73	107.46	0.03	1564.97	251.04	0.02	1227.51	205.92	0.07	1193.75	226.18	0.05	871.68	109.84	0.03
Pb	67.10	8.34	0.08	120.74	16.62	0.10	77.02	11.32	0.13	89.20	13.94	0.11	66.62	5.80	0.06
Th	5737.75	515.26	0.05	7477.90	827.30	0.02	5572.01	636.90	0.20	5711.78	718.16	0.16	3808.97	316.38	0.06
U	192.99	20.38	0.02	212.98	23.84	b.d	186.25	21.58	0.05	197.59	24.98	0.02	213.96	17.76	0.02

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Table C4. Trace element concentration, limits of detection and uncertanties (2-sigma error) of perovskite from TR-IV and LM-I samples.

C - core region (average composition); LOD - limit of detection; b.d - below detection.

Sample	TRIV-5-3	2σ error	LOD
Grain/Analyses	05/05	05/05	05/05
Location	C	C	C
Mg	5256.41	602.90	0.30
Al	1586.65	176.98	1.05
Sc	2.49	0.66	0.20
V	46.35	4.32	0.25
Mn	168.37	13.20	0.72
Fe	8592.28	1264.36	5.47
Sr	4918.99	396.78	0.02
Y	161.72	20.32	0.03
Zr	463.47	45.02	0.21
Nb	5616.00	631.22	0.02
Ba	74.62	15.82	0.21
La	18922.63	4341.50	0.03
Ce	43498.28	8128.98	0.02
Pr	5149.95	965.08	0.03
Nd	18398.01	3093.02	0.30
Sm	1506.56	182.18	0.18
Eu	280.17	52.00	0.03
Gd	670.60	144.08	0.14
Tb	42.88	8.76	0.01
Dy	129.99	22.34	0.10
Ho	11.70	2.00	0.01
Er	20.54	3.44	0.06
Tm	1.15	0.28	0.02
Yb	4.07	1.30	0.13
Lu	0.35	0.15	0.02
Hf	21.18	4.38	0.08
Ta	1147.64	180.04	0.03
Pb	101.95	8.50	0.07
Th	8123.66	771.52	0.01
U	147.78	13.98	b.d