

Supplementary Information for Mozjisis et al.

“Oxygen-isotope evidence from ancient zircons for liquid water at the Earth’s surface 4300 Myr ago”

Each of the following tables is dedicated either to a standard (e.g. 91500 or kim5) or a data point (e.g., cf01\_95\_1). The name of this table means that it was a zircon from mount cf01, number 95 and the first spot analyzed for oxygen. Every oxygen data point reported in our paper is a duplicate measurement of the same spot.

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
5.838	0.1372	0.1372	0.018824	53.12412345	310.1386	0.000248
5.832	0.183	0.183	0.033489	29.86055123	174.1467	0.000441
5.8350				0.012050418	wmean	mstd
0.004			w_stderr	0.109774395	5.835841	0.000688
					total 2 s	
					0.000506	

cf01\_12\_1 7.275841 value after correction for isotopic fractionation by the standards  
 first spot analysis for oxygen isotopes, 2 measurements on the same spot

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
5.623	0.1291	0.1291	0.016667	59.999484	337.3771	1.625288
5.364	0.09778	0.09778	0.009561	104.5923532	561.0334	0.932348
5.501	0.1296	0.1296	0.016796	59.53741808	327.5153	0.107972
5.678	0.112	0.112	0.012544	79.71938776	452.6467	3.843891
5.4935				0.006075635	wmean	mstd
0.183			w_stderr	0.077946363	5.458415	0.852545
					total 2 s	
					0.155893	

cf01\_12\_2 6.898415 value after correction for isotopic fractionation by the standards  
second oxygen isotope analysis on grain JH992\_12, duplicated four times on the same sp

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
7.149	0.1044	0.1044	0.010899	91.74850633	655.9101	0.629206
6.758	0.2014	0.2014	0.040562	24.653641	166.6093	2.341589
6.993	0.1155	0.1155	0.01334	74.96111392	524.2031	0.401521
6.9535				0.008590907	wmean	mstd
0.276			w_stderr	0.092687145	7.066187	0.990265
					total 2 s	
					0.185374	

cf01\_12\_3 8.506187 value after correction for isotopic fractionation by the standards  
third oxygen isotope analysis on JH992\_12, duplicated 3 times on the same spot

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
8.388	0.1136	0.1136	0.012905	77.4895854	649.9826	1.254838
8.061	0.1128	0.1128	0.012724	78.59262613	633.5352	16.21734
8.618	0.09447	0.09447	0.008925	112.0500796	965.6476	1.182879
8.9	0.1063	0.1063	0.0113	88.49800304	787.6322	13.1003
8.4918				0.002804024	wmean	mstd
0.178			w_stderr	0.052953038	8.515254	10.58512
					total 2 s	
					0.344563	

cf01\_42\_1 9.955254 value after correction for isotopic fractionation by the standards  
first measurement of JH992\_42 duplicated 4 times on the same spot

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
7.692	0.1793	0.1793	0.032148	31.10566002	239.2647	0.550137
7.596	0.07981	0.07981	0.00637	156.9948399	1192.533	0.214798
7.691	0.1827	0.1827	0.033379	29.95869595	230.4123	0.521913
7.617	0.1412	0.1412	0.019937	50.15689075	382.045	0.168664
7.463	0.115	0.115	0.013225	75.61436673	564.31	0.697022
7.142	0.209	0.209	0.043681	22.89324878	163.5036	3.981095
7.5335				0.002726849	wmean	mstd
0.042			w_stderr	0.052219236	7.559011	1.226726
					total 2 s	
					0.115674	

cf01\_42\_2 8.999011 value after correction for isotopic fractionation by the standards  
second measurement of oxygen isotope value duplicated 6 times on the same spot

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
7.747	0.1098	0.1098	0.012056	82.94597563	642.5825	0.712378
7.558	0.1158	0.1158	0.01341	74.57321748	563.6244	0.691943
7.719	0.2913	0.2913	0.084856	11.78471355	90.9662	0.049292
8.025	0.2293	0.2293	0.052578	19.01918446	152.629	2.61322
7.578	0.1925	0.1925	0.037056	26.98600101	204.4999	0.157212
7.16	0.2811	0.2811	0.079017	12.65547088	90.61317	3.092469
7.6312				0.004386647	wmean	mstd
0.116			w_stderr	0.066231765	7.654326	1.219419
					total 2 s	
					0.146276	

cf01\_42\_3 9.094326 value after correction for isotopic fractionation by the standards  
third measurement of oxygen isotopic value duplicated 6 times on the same spot

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
13.285	0.1104	0.1104	0.012188	82.0468389	1089.992	8.101599
13.525	0.1462	0.1462	0.021374	46.78485144	632.7651	0.257823
13.815	0.2017	0.2017	0.040683	24.58035798	339.5776	1.144328
13.935	0.1184	0.1184	0.014019	71.33400292	994.0393	8.042067
13.6400				0.004449466	wmean	mstd
0.146			w_stderr	0.066704321	13.59923	8.772908
					total 2 s	
					0.395144	

cf01\_42\_4 15.03923 value after correction for isotopic fractionation by the standards  
fourth measurement of oxygen isotope value measured on the same spot and duplicated 4



d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
6.31	0.144	0.144	0.020736	48.22530864	304.3017	0.295905
6.403	0.07756	0.07756	0.006016	166.2357393	1064.407	4.87979
6.439	0.2465	0.2465	0.060762	16.45758674	105.9704	0.707455
5.991	0.2506	0.2506	0.0628	15.9234756	95.39754	0.922305
5.74	0.1256	0.1256	0.015775	63.38999554	363.8586	15.32374
6.218	0.1426	0.1426	0.020335	49.17687743	305.7818	0.009187
6.1835				0.002782346	wmean	mswd
0.110			w_stderr	0.052747944	6.231668	4.427676
					total 2 s	
					0.221985	

cf01\_48\_1 7.671668 value after correction for isotopic fractionation by the standards  
first measurement of oxygen isotope value of the same spot duplicated 6 times

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
7.349	0.4887	0.4887	0.238828	4.187119174	30.77114	5.900855
6.725	0.2773	0.2773	0.076895	13.00469769	87.45659	4.124051
5.998	0.2003	0.2003	0.04012	24.92516841	149.5012	0.669291
5.355	0.3135	0.3135	0.098282	10.17477724	54.48593	6.62411
6.3568				0.019123471	wmean	mstd
0.866			w_stderr	0.138287638	6.161866	5.772769
					total 2 s	
					0.664516	

cf01\_48\_2 7.601866 value after correction for isotopic fractionation by the standards  
second measurment of the oxygen isotope value for the same spot duplicated 4 times

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
5.683	0.1859	0.1859	0.034559	28.93618154	164.4443	0.403356
5.559	0.0664	0.0664	0.004409	226.8108579	1260.842	0.007987
5.515	0.1553	0.1553	0.024118	41.46265314	228.6665	0.103384
5.5857				0.003364628	wmean	mstd
0.062			w_stderr	0.058005412	5.564934	0.257364
					total 2 s	
					0.058854	

cf01\_76\_1 6.594934 value after correction for isotopic fractionation by the standards  
first measurement of the oxygen isotope value for the same spot duplicated 3 times

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
5.513	0.1448	0.1448	0.020967	47.69390434	262.9365	15.49031
4.598	0.1098	0.1098	0.012056	82.94597563	381.3856	9.878374
4.993	0.1859	0.1859	0.034559	28.93618154	144.4784	0.072051
5.0347				0.006266604	wmean	mstd
0.265			w_stderr	0.079161885	4.9431	25.44073
					total 2 s	
					0.798566	

cf01\_76\_2      5.9731 value after correction for isotopic fractionation by the standards  
second measurment of the oxygen isotope value for the same spot duplicated 3 times

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
4.846	0.1145	0.1145	0.01311	76.27619611	369.6344	18.606
3.917	0.1131	0.1131	0.012792	78.17624208	306.2163	14.80025
4.288	0.1324	0.1324	0.01753	57.04584661	244.6126	0.234449
4.3503				0.004728171	wmean	mstd
0.270			w_stderr	0.068761695	4.352108	16.82035
					total 2 s	
					0.564019	

cf01\_76\_3 5.382108 value after correction for isotopic fractionation by the standards  
third measurement of the oxygen isotope value of the same spot duplicated 3 times

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
5.37	0.1095	0.1095	0.01199	83.40109672	447.8639	22.05328
4.743	0.118	0.118	0.013924	71.81844298	340.6349	0.913449
4.521	0.0981	0.0981	0.009624	103.9111103	469.7821	11.64597
4.8780				0.003859057	wmean	mstd
0.254			w_stderr	0.06212131	4.855778	34.6127
					total 2 s	
					0.730951	

cf01\_88\_1 5.885778 value after correction for isotopic fractionation by the standards  
first measurement on spot 1 duplicated 3 times

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
5.625	0.1265	0.1265	0.016002	62.49121217	351.5131	8.846667
5.37	0.1095	0.1095	0.01199	83.40109672	447.8639	1.226194
5.379	0.06939	0.06939	0.004815	207.6855232	1117.14	3.523579
4.893	0.07657	0.07657	0.005863	170.5621673	834.5607	21.58561
5.3168				0.001907887	wmean	mstd
0.153			w_stderr	0.043679368	5.248747	17.59103
					total 2 s	
					0.366397	

cf01\_88\_3 6.278747 value after correction for isotopic fractionation by the standards

ALSO:

d18O 1 s.e location

5.625 0.1265 spot4

NOTE: THIS WAS ADDED TO ABOVE DATA SET

measurement was duplicated for the same spot a total of 4 times

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
5.568	0.1426	0.1426	0.020335	49.17687743	273.8169	22.98351
5.57	0.1685	0.1685	0.028392	35.22087894	196.1803	16.55743
4.434	0.1154	0.1154	0.013317	75.09108549	332.9539	15.23026
4.354	0.1393	0.1393	0.019404	51.53446445	224.3811	14.49568
4.951	0.08152	0.08152	0.006646	150.4775314	745.0143	0.668262
4.794	0.1166	0.1166	0.013596	73.55342479	352.6151	0.600553
4.9452				0.002298564	wmean	mstd
0.217			w_stderr	0.04794334	4.88436	14.10714
					total 2 s	
					0.360145	

cf01\_90\_1 5.91436 value after correction for isotopic fractionation by the standards  
duplicate measurments of spot 1 repeated 6 times



d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
5.324	0.1231	0.1231	0.015154	65.9908761	351.3354	0.236318
5.483	0.08364	0.08364	0.006996	142.9459817	783.7728	6.845948
5.106	0.1127	0.1127	0.012701	78.73216028	402.0064	1.969401
5.127	0.08551	0.08551	0.007312	136.7622342	701.18	2.572812
5.141	0.175	0.175	0.030625	32.65306122	167.8694	0.495278
5.2362				0.00218778	wmean	mstd
0.073			w_stderr	0.046773712	5.264158	4.039919
					total 2 s	
					0.188026	

cf01\_95\_1 6.294158 value after correction for isotopic fractionation by the standards  
5 duplicate measurements of spot 1

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
5.022	0.1209	0.1209	0.014617	68.41438043	343.577	17.11188
5.172	0.08436	0.08436	0.007117	140.5163492	726.7506	17.22517
5.874	0.06495	0.06495	0.004219	237.050944	1392.437	29.35135
5.3560				0.002242245	wmean	mstd
0.263			w_stderr	0.047352345	5.522121	63.6884
					total 2 s	
					0.755791	

cf01\_95\_2 6.552121 value after correction for isotopic fractionation by the standards  
3 duplicate measurements of spot 2

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
5.022	0.1209	0.1209	0.014617	68.41438043	343.577	4.645808
5.759	0.1302	0.1302	0.016952	58.98995047	339.7231	13.38877
5.14	0.1178	0.1178	0.013877	72.06251567	370.4013	1.465159
5.3070				0.005013364	wmean	mstd
0.229			w_stderr	0.070805116	5.28259	19.49974
					total 2 s	
					0.62533	

cf01\_95\_3      6.31259 value after correction for isotopic fractionation by the standards  
3 duplicate measurements of spot 3

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
8.707	0.2824	0.2824	0.07975	12.53922269	109.179	2.269093
8.985	0.3133	0.3133	0.098157	10.18777184	91.53713	5.040527
8.16	0.1153	0.1153	0.013294	75.22139537	613.8066	1.112385
8.3	0.2659	0.2659	0.070703	14.14370942	117.3928	0.004785
8.486	0.3291	0.3291	0.108307	9.233029761	78.35149	0.385726
8.23	0.316	0.316	0.099856	10.01442077	82.41868	0.026671
7.955	0.2935	0.2935	0.086142	11.60870537	92.34725	1.238322
7.969	0.441	0.441	0.194481	5.141890467	40.97573	0.50248
7.874	0.5615	0.5615	0.315282	3.171761176	24.97445	0.526966
7.59	0.3283	0.3283	0.107781	9.278082599	70.42065	4.437888
9.084	0.3278	0.3278	0.107453	9.306408281	84.53941	5.991795
7.547	0.21	0.21	0.0441	22.67573696	171.1338	12.23689
9.248	0.5082	0.5082	0.258267	3.871958364	35.80787	3.616085
9.408	0.5861	0.5861	0.343513	2.911096199	27.38759	3.693489
9.136	0.2186	0.2186	0.047786	20.92664875	191.1859	15.27621
8.164	0.2616	0.2616	0.068435	14.61249988	119.2964	0.20211
8.115	0.1072	0.1072	0.011492	87.01826687	706.1532	2.415429
8.373	0.1029	0.1029	0.010588	94.44288614	790.7703	0.78886
8.4073				0.002402082	wmean	mswd
0.134			w_stderr	0.049011041	8.281606	3.51563
					total 2 s	
						0.183792

022500/91500\_oxy  
zircon oxygen isotope standard

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
8.132	0.1121	0.1121	0.012566	79.57722213	647.122	1.611512
8.231	0.0956	0.0956	0.009139	109.4168519	900.6101	6.371173
8.012	0.0866	0.0866	0.0075	133.341156	1068.329	0.066343
8.037	0.07671	0.07671	0.005884	169.9401646	1365.809	0.380297
7.787	0.1653	0.1653	0.027324	36.59774214	284.9866	1.503617
8.075	0.09098	0.09098	0.008277	120.8114606	975.5525	0.879153
8	0.05093	0.05093	0.002594	385.5250904	3084.201	0.040946
7.806	0.1926	0.1926	0.037095	26.95798544	210.434	0.909659
8.245	0.2347	0.2347	0.055084	18.15406227	149.6802	1.1833
8.344	0.1202	0.1202	0.014448	69.21354038	577.5178	8.688551
7.903	0.09388	0.09388	0.008813	113.4628892	896.6972	0.852776
8.334	0.1512	0.1512	0.022861	43.74177655	364.544	5.185431
8.277	0.1284	0.1284	0.016487	60.65546724	502.0453	5.00678
7.685	0.06768	0.06768	0.004581	218.3128503	1677.734	20.26786
7.782	0.06996	0.06996	0.004894	204.3150689	1589.98	8.813522
7.877	0.1175	0.1175	0.013806	72.43096424	570.5387	0.919873
8.245	0.1149	0.1149	0.013202	75.7460417	624.5261	4.937203
7.834	0.1824	0.1824	0.03327	30.05732533	235.4691	0.728611
8.0337				0.000508064	wmean	mstd
0.050			w_stderr	0.022540265	7.989694	4.556441
					total 2 s	
					0.096228	

022600/91500\_oxy

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
3.105	0.08416	0.08416	0.007083	141.1849962	438.3794	115.8791
3.588	0.06412	0.06412	0.004111	243.2276662	872.7009	43.51195
2.943	0.1381	0.1381	0.019072	52.43395812	154.3131	59.80278
4.541	0.1061	0.1061	0.011257	88.83195747	403.3859	24.9568
4.398	0.09056	0.09056	0.008201	121.9346602	536.2686	18.26595
4.449	0.08672	0.08672	0.00752	132.972386	591.5941	25.51479
2.861	0.2874	0.2874	0.082599	12.10671928	34.63732	16.00998
2.978	0.3547	0.3547	0.125812	7.948361719	23.67022	8.480928
3.935	0.1324	0.1324	0.01753	57.04584661	224.4754	0.329137
4.609	0.3963	0.3963	0.157054	6.367249315	29.34665	2.27727
2.766	0.4919	0.4919	0.241966	4.132818709	11.43138	6.405545
3.423	0.1872	0.1872	0.035044	28.53568559	97.67765	9.86465
4.846	0.3442	0.3442	0.118474	8.440696175	40.90361	5.885649
3.928	0.3598	0.3598	0.129456	7.724629921	30.34235	0.053162
4.511	0.09964	0.09964	0.009928	100.7239067	454.3655	25.18516
4.37	0.1104	0.1104	0.012188	82.0468389	358.5447	10.57672
4.373	0.08258	0.08258	0.006819	146.6392541	641.2535	19.2206
4.35	0.09263	0.09263	0.00858	116.545812	506.9743	13.39684
3.8874				0.00073592	wmean	mstd
0.166			w_stderr	0.027127845	4.010959	23.85982
					total 2 s	
					0.26502	

022500/kim5\_oxy  
zircon oxygen isotope standard

d18O	stdev	total stdev	variance	1/variance	d18O/var	chi
3.965	0.1546	0.1546	0.023901	41.83897351	165.8915	5.647734
3.457	0.07063	0.07063	0.004989	200.4571666	692.9804	3.962355
2.948	0.1207	0.1207	0.014568	68.64129364	202.3545	28.9647
3.615	0.1455	0.1455	0.02117	47.23609783	170.7585	0.014312
3.879	0.173	0.173	0.029929	33.41240937	129.6067	2.645912
3.286	0.07151	0.07151	0.005114	195.553883	642.5901	18.98645
3.388	0.09741	0.09741	0.009489	105.3884248	357.056	4.629663
4.137	0.08901	0.08901	0.007923	126.2183208	522.1652	36.72438
3.548	0.2018	0.2018	0.040723	24.55600291	87.1247	0.060396
3.541	0.08493	0.08493	0.007213	138.636553	490.912	0.444032
3.687	0.1275	0.1275	0.016256	61.514802	226.8051	0.491718
3.534	0.1287	0.1287	0.016564	60.37302075	213.3583	0.244158
3.786	0.08119	0.08119	0.006592	151.7032613	574.3485	5.385
3.744	0.07068	0.07068	0.004996	200.1736546	749.4502	4.290683
3.762	0.1189	0.1189	0.014137	70.73531482	266.1063	1.911935
3.6185				0.000655119	wmean	mstd
0.075			w_stderr	0.025595301	3.597594	8.171673
					total 2 s	
					0.146334	

022600/kim5\_oxy