

Sample	Phase	$\delta^{18}\text{O}$ (‰/VPDB)	$\delta^{13}\text{C}$ (‰/VPDB)
Sua.40	host limestone	-4.16	1.48
Sua.41	host limestone	4.15	-1.58
Sua.43	host limestone	-4.33	0.79
SP.27	host limestone	-4.38	0.88
Sua.37	host limestone	-6.69	1.73
Sua.44	host limestone	-5.07	0.96
Sp.28	host limestone	-4.93	1.07
Sp.22	host limestone	-6.70	0.74
Sp.23	host limestone	-6.31	0.31
Sp.1	DI	-6.85	2.25
SP.2	DI	-6.77	1.22
SP.6	DS	-6.58	2.18
SP.16	DII	-6.95	-0.19
SP.18	DS	-6.56	2.24
Sua.1	DII	-7.47	2.09
Sua.4	DI	-6.67	1.73
Sua.5	DI	-6.92	0.85
Sua6	DI	-7.78	1.15
Sua7	DI	-7.49	1.94
Sua2	SS	-7.46	1.33
Sua10	DI	-7.95	0.83
Sua11	DI	-7.52	0.67
Sub1	DII	-6.75	1.73
Sub3	DI	-7.13	1.48
Sub6	DII	-7.43	1.14
Sua.1	DII	-7.06	2.28
SP.1	DI	-6.79	2.26
SP.19	DI	-6.74	2.49
Sua.3	DI	-7.26	1.29
SP.5	DII	-7.96	0.98
SP.2	SD1	-7.38	-8.74
Sp.4	SD2	-6.49	1.48
SP.5	SD	-6.64	1.88
SP.7	SD3	-6.84	2.02
SP.9	SD3	-6.29	1.75
SP.13	SD3	-8.20	-0.48
SP.17	SD2	-6.25	1.66
Sua.3	SD2	-7.15	1.58
Sua.3	SD3	-8.11	1.47
Sua.5	SD2	-7.76	1.44
Sua5	SD3	-8.04	0.61
Sua6	SD3	-7.16	0.64
Sub1	SD2	-7.13	1.53

Sub2	SD3	-8.03	1.87
Sua.4	SD1	-6.97	1.64
SP.22	SD1	-6.24	0.94
SP.11	SD	-7.01	-0.70
SP.17	SD2	-6.13	1.59
Sua.11	SD3	-8.39	1.51
Sub.2	SD3	-7.74	1.71
Sp.4	CII	-17.50	-5.06
Sp.5	CI	-14.12	-1.88
SP.17	CI	-16.36	-6.92
Sua.1	CII	-7.73	1.11
Sua.2	CI	-6.98	0.03
Sua.4	CI	-9.77	0.49
Sua8	CI	-10.15	0.57
Sua.33	CI	-9.74	0.52
Sua.39	CII	-9.83	0.50
SP.23	CI	-17.40	-5.86
SP.20	CI	-14.92	-2.26
Sua.8	CII	-9.88	0.80

Table 1. Stable oxygen and carbon isotopic data obtained on host limestone and cements filling the pore spaces and fractures. (n = 62). DI, DII = matrix dolomites, DS = saccharoidal dolomite, SD = saddle dolomites, CI, CII = blocky calcites.

Grain	²⁰⁶ Pb ^a	U ^b	Pb ^b	Th ^b	²³⁸ U ^c	±2σ	²⁰⁷ Pb ^c	±2σ
	(cps)	(ppm)	(ppm)	U	²⁰⁶ Pb	(%)	²⁰⁶ Pb	(%)
NIST-SRM 614								
NIST614 01	151223	0.81	2.37	0.96	1.241	1.8	0.8714	0.6
NIST614 02	152109	0.82	2.40	0.97	1.230	1.9	0.8711	0.6
Nist614 33	153445	0.81	2.37	0.93	1.240	1.8	0.8662	0.5
Nist614 34	150955	0.81	2.36	0.92	1.244	1.8	0.8730	0.6
Nist614 69	150536	0.81	2.36	0.93	1.246	1.9	0.8700	0.6
Nist614 70	154694	0.82	2.43	0.93	1.226	1.9	0.8705	0.5
Nist614 102	148233	0.80	2.34	0.94	1.237	1.8	0.8696	0.5
Nist614 103	149396	0.81	2.36	0.90	1.238	1.8	0.8714	0.6
Nist614 146	146500	0.80	2.33	0.96	1.240	1.9	0.8728	0.6
Nist614 147	149092	0.81	2.36	0.91	1.241	1.8	0.8693	0.5
Nist614 194	150754	0.82	2.42	0.91	1.234	1.8	0.8734	0.6
Nist614 193	144523	0.81	2.35	0.95	1.247	1.8	0.8766	0.6
Nist614 238	146867	0.81	2.39	0.88	1.232	1.8	0.8709	0.5
Nist614 237	147231	0.82	2.39	0.91	1.230	1.8	0.8651	0.6
NIST614 283	145071	0.82	2.40	0.90	1.237	1.8	0.8670	0.6
Nist614 282	144885	0.82	2.40	0.90	1.236	1.8	0.8719	0.6
NIST614 328	146642	0.84	2.46	0.87	1.240	1.9	0.8700	0.5
Nist614 327	141742	0.83	2.41	0.96	1.244	1.8	0.8751	0.6
NIST614 383	142172	0.84	2.45	0.90	1.243	1.8	0.8685	0.6

Nist614 382	141383	0.83	2.43	0.90	1.235	1.8	0.8713	0.6
NIST614 450	143098	0.86	2.51	0.92	1.235	1.8	0.8730	0.5
WC-1								
Calcite 04	57958	3.60	0.24	<0.001	21.30	2.7	0.1674	4.4
Calcite 03	57442	3.58	0.23	<0.001	21.11	2.1	0.1610	3.2
Calcite 30	53037	3.26	0.22	<0.001	20.98	3.0	0.1761	3.1
Calcite 35	55525	3.55	0.22	<0.001	21.22	2.3	0.1519	3.9
Calcite 36	52116	3.08	0.23	<0.001	20.15	4.0	0.1999	10.8
Calcite 67	60273	3.87	0.24	<0.001	21.96	2.3	0.1595	5.3
Calcite 68	50337	2.99	0.22	<0.001	19.87	3.3	0.2024	9.1
Calcite 102	61659	3.57	0.28	<0.001	19.54	2.7	0.2120	6.8
Calcite 103	55004	3.42	0.23	<0.001	20.82	2.3	0.1874	5.1
Calcite 146	53194	3.33	0.24	<0.001	20.20	4.5	0.1916	6.3
Calcite 147	47066	3.01	0.19	<0.001	21.37	2.5	0.1567	4.9
Calcite 195	53947	3.66	0.23	<0.001	21.43	2.6	0.1489	3.7
Calcite 196	52916	3.60	0.21	<0.001	22.27	2.3	0.1489	3.0
Calcite 239	54507	3.76	0.22	<0.001	22.09	2.3	0.1459	2.8
Calcite 240	56367	3.70	0.24	<0.001	21.39	2.2	0.1842	4.3
Calcite 329	53738	3.63	0.23	<0.001	21.39	2.5	0.1598	6.0
Calcite 384	50897	3.54	0.23	<0.001	21.21	2.6	0.1747	7.6
Calcite 451	51850	3.55	0.25	<0.001	19.98	4.1	0.1843	10.6
e 285	46761	3.18	0.19	<0.001	22.16	2.2	0.1625	5.2
Calcite 452	52066	3.76	0.24	<0.001	21.40	2.4	0.1612	3.2
Calcite 507	49116	3.34	0.24	<0.001	20.37	2.5	0.2071	6.5
Calcite 561	49407	3.65	0.23	<0.001	21.36	2.1	0.1661	4.2
Zechstein dolomite								
ZD 05	383976	2.17	3.12	0.02	2.27	5.5	0.7410	0.6
ZD 37	434820	1.59	3.88	0.02	1.35	4.4	0.7685	0.6
ZD 71	145036	2.03	1.15	0.02	5.22	4.2	0.6482	0.8
ZD 106	98172	1.87	0.82	0.03	6.51	3.2	0.6210	0.9
ZD 150	103377	0.88	0.99	0.05	2.89	2.6	0.7279	0.7
ZD 198	38804	0.90	0.36	0.07	6.60	2.4	0.6067	0.7
ZD 242	15608	0.07	0.16	0.12	1.54	4.2	0.7679	0.9
ZD 287	159760	0.86	1.80	0.08	1.64	8.4	0.7706	0.8
ZD 387	104283	4.59	0.80	0.01	13.05	2.9	0.4131	0.6
ZD 197	90226	2.21	0.72	0.02	8.17	3.9	0.5666	1.2
ZD 241	72961	2.16	0.53	0.02	10.03	3.9	0.4992	1.4
ZD 286	57874	2.37	0.37	0.02	13.71	5.2	0.3945	2.8
ZD 331	66408	2.24	0.49	0.00	10.76	2.4	0.4842	0.9
ZD 386	138406	2.21	1.21	0.02	5.72	3.0	0.6317	0.6
ZD 508	114549	2.26	1.08	0.02	5.96	7.7	0.6264	1.3
ZD 562	99812	2.70	0.90	0.02	8.06	3.5	0.5751	1.3
ZD 385	51470	3.65	0.21	0.00	22.01	2.3	0.1443	3.0

Table 2: Concentration of U-Pb and U-Th-Pb isotopes of reference standards.

Spot size = 213 μm . $^{238}\text{U}/^{206}\text{Pb}$ error is the quadratic additions of the within run precision (2 SE) and excess of variance of 2% (2 SD) . $^{207}\text{Pb}/^{206}\text{Pb}$ uncertainty propagation as described in Gerdes & Zeh (2009).

^a Within run background-corrected mean ²⁰⁶Pb signal in cps (counts per second).

^b U and Pb content and Th/U ratio were calculated relative to NIST SRM614 reference.

^c corrected for background, within-run Pb/U fractionation (in case of ²⁰⁶Pb/²³⁸U) and subsequently normalised to NIST SRM 614 and carbonate matrix effect of 4% for ²⁰⁶Pb/²³⁸U.

Grain	Sample name	Phase	²⁰⁶ Pb ^a	U ^b	Pb ^b	Th ^b	²³⁸ U ^d	±2s	²⁰⁷ Pb ^d	±2s
			(cps)	(ppm)	(ppm)	U	²⁰⁶ Pb	(%)	²⁰⁶ Pb	(%)
A06	Sub.1	Saddle dolomite	2445	0.059	0.024	0.071	8.315	7.9	0.7873	3.1
A07			3219	0.074	0.030	0.180	8.089	10.7	0.7679	3.5
A08			2957	0.040	0.029	0.155	4.764	4.5	0.8165	3.1
A09			1591	0.038	0.014	0.144	9.024	5.4	0.7837	3.4
A10			1163	0.027	0.011	0.145	8.299	5.5	0.7889	4
A11			1738	0.021	0.017	0.180	4.405	6.6	0.8059	3.5
A12			2295	0.019	0.023	0.162	2.936	6.6	0.8353	3.1
A13			3834	0.062	0.039	0.183	5.622	4.4	0.8043	3
A14			1778	0.065	0.016	0.163	13.04	4.0	0.7439	3.3
A15			799	0.032	0.007	0.131	15.00	6.4	0.7307	3.6
A16			1351	0.039	0.013	0.136	10.29	4.1	0.7782	3.5
A17			908	0.045	0.008	0.144	17.07	6.6	0.7265	3.7
A19			12853	0.055	0.131	0.165	1.497	3.4	0.8384	1.6
A20			3502	0.063	0.034	0.188	6.346	2.9	0.7881	3
A21			2260	0.062	0.023	0.218	9.468	4.9	0.7824	2.5
A22			2539	0.080	0.024	0.199	11.04	3.5	0.7477	2.7
A23			2877	0.066	0.025	0.404	8.954	4.3	0.7561	2.4
A24			2275	0.068	0.023	0.208	10.42	4.8	0.7795	3
A26			4751	0.092	0.048	0.304	6.769	4.6	0.8051	2.3
A27			9624	0.052	0.096	0.172	1.919	2.5	0.8437	1.5
A28			3690	0.033	0.037	0.143	3.145	4.4	0.8272	2.4
A29			1481	0.068	0.014	0.399	16.32	4.8	0.7216	3.8
A30			1658	0.056	0.016	0.147	11.91	4.7	0.7606	3.7
A31			2452	0.076	0.025	0.180	10.65	5.7	0.7752	2.5
A32			3631	0.077	0.057	0.149	6.848	9.1	0.7924	3.1
A38			830	0.020	0.008	0.158	8.335	6.7	0.773	3.9
A39			6960	0.006	0.071	0.072	0.3165	4.7	0.8477	2.3
A40			2322	0.006	0.024	0.074	0.9185	3.7	0.8455	2.8
A41			5201	0.004	0.053	0.057	0.2457	4.2	0.8593	2
A42			12219	0.005	0.124	0.043	0.1347	3.2	0.864	1.4
A43			4844	0.031	0.048	0.126	2.305	2.9	0.8369	2.8
A44			3867	0.046	0.038	0.193	4.243	4.6	0.8131	2.7
A45			2696	0.065	0.027	0.154	8.406	3.7	0.7796	2.3
A46			3347	0.074	0.032	0.478	7.864	5.5	0.7901	2.7
A47		Dolomite	27456	0.731	0.240	0.034	9.286	6.6	0.69	1.8

A48		matrix	30549	0.750	0.311	0.041	8.788	3.8	0.6903	1.4
A49			18500	0.771	0.161	0.045	14.56	4.5	0.6581	1.6
A50			35559	0.886	0.326	0.036	8.409	6.2	0.7084	1.2
A51			28086	0.733	0.242	0.040	9.486	4.1	0.6948	1.5
A52			23446	0.798	0.203	0.038	11.78	5.3	0.6728	1.3
A53			25007	0.760	0.228	0.042	10.24	6.0	0.6876	1.4
A55			29040	0.767	0.260	0.042	9.229	5.5	0.7041	1.2
A56			31901	1.208	0.283	0.030	12.6	6.1	0.672	1.2
A57			25437	1.024	0.233	0.030	13.68	6.3	0.6616	1.7
A58			29474	0.881	0.255	0.034	10.53	6.5	0.6837	1.2
A59			63440	0.833	0.547	0.042	4.871	5.6	0.7279	0.93
A60			36322	1.042	0.334	0.032	9.749	3.4	0.7005	1.1
A61			41734	0.793	0.383	0.042	6.556	3.8	0.7166	1
A62			36893	0.826	0.346	0.038	7.53	4.6	0.7072	1.4
A63	Sua.1	Blocky calcite (CII)	2260	0.024	0.013	0.588	6.391	26.6	0.844	5
A64			358	0.034	0.003	0.643	35.47	7.6	0.7854	6.1
A65			434	0.027	0.004	0.403	21.79	11.7	0.774	7.4
A66			374	0.015	0.004	0.608	14.48	10.0	0.8186	4.9
A72			819	0.032	0.009	0.475	13.27	7.6	0.8289	6
A73			388	0.034	0.003	0.407	40.11	6.3	0.7343	8.9
A74			425	0.019	0.004	0.122	15.82	6.2	0.7917	7
A75			480	0.007	0.004	0.438	6.301	6.2	0.8117	5
A76			268	0.008	0.002	0.944	14.85	10.2	0.779	5.8
A77			327	0.013	0.003	1.538	15.13	6.5	0.8118	6
A78			3056	0.007	0.026	1.125	0.9784	10.6	0.8375	2.8
A79			437	0.028	0.004	0.335	23.32	6.3	0.7703	6.5
A80			219	0.013	0.002	0.231	22.01	11.4	0.8009	7
A81			2849	0.080	0.028	0.065	9.484	3.0	0.7898	3.4
A82			1387	0.009	0.014	0.833	2.191	5.5	0.8133	4
A83			286	0.010	0.003	0.291	11.92	9.2	0.7848	6.4
A84			1549	0.047	0.015	0.620	10.41	3.8	0.8246	3.9
A85			3045	0.053	0.031	1.156	6.188	5.1	0.8448	3.2
A86			7459	0.051	0.072	1.375	2.535	2.7	0.843	2.4
A87			678	0.044	0.006	1.174	23.46	4.8	0.8002	4.5
A88		Blocky calcite (CI)	731	0.021	0.007	0.220	10.5	5.0	0.7924	4.4
A89			549	0.012	0.005	1.009	9.02	7.4	0.7871	6.7
A90			499	0.035	0.005	0.314	26.65	8.4	0.7201	9.1
A091			700	0.030	0.006	0.472	17.52	11.4	0.7494	6.4
A92			820	0.045	0.007	0.697	23.22	7.7	0.7397	7.3
A93			481	0.043	0.004	0.359	34.01	8.0	0.6675	11
A94			2185	0.046	0.021	0.646	7.664	6.5	0.8016	3.2
A95			414	0.029	0.003	0.204	33.98	8.6	0.6905	10
A96			4949	0.050	0.048	0.270	3.549	2.5	0.7817	2.3
A97			944	0.074	0.009	0.261	27.32	4.5	0.693	6.9
A98			9249	0.027	0.048	0.233	1.988	7.2	0.811	2

A99			754	0.050	0.007	0.227	22.88	6.4	0.7282	6.8
A100			1353	0.041	0.013	0.387	10.53	4.7	0.7758	4.6
A101			705	0.039	0.006	0.378	19.94	5.7	0.725	5
A107			476	0.010	0.006	0.221	4.894	9.9	0.8231	5.2
A108			692	0.006	0.007	0.116	3.153	6.8	0.7969	6.9
A109			146	0.015	0.007	0.120	35.44	11.3	0.6633	11
A110			973	0.032	0.009	0.177	11.45	8.4	0.7576	7
A111			207	0.033	0.002	0.173	57.37	7.6	0.5805	9.2
A112			431	0.042	0.003	0.188	40.77	6.5	0.6418	12
A113			1814	0.051	0.017	0.195	9.568	3.5	0.7623	4.1
A114			10657	0.128	0.086	0.068	4.157	3.5	0.7733	0.98
A115			3394	0.077	0.019	0.127	9.399	3.6	0.7614	1.2
A116	Sua.9	Limestone	77441	1.427	0.734	0.023	6.382	2.2	0.7533	0.64
A117			84705	1.562	0.804	0.029	6.344	2.6	0.7505	0.7
A119			80071	1.546	0.760	0.029	6.632	2.2	0.7464	0.49
A120			86624	1.691	0.824	0.025	6.729	2.5	0.751	0.61
A121			80257	1.641	0.760	0.024	7.042	2.3	0.7464	0.69
A122			93620	1.591	0.888	0.027	5.884	2.6	0.7533	0.59
A123			79601	1.496	0.756	0.026	6.457	2.1	0.7489	0.6
A124			88597	1.720	0.830	0.026	6.755	2.3	0.7498	0.61
A125			95505	1.792	0.906	0.025	6.486	2.2	0.7517	0.61
A126			124604	2.042	1.188	0.023	5.628	3.8	0.7547	0.56
A127			102476	1.693	0.975	0.024	5.695	2.2	0.7518	0.49
A128			86270	1.836	0.821	0.024	7.331	2.4	0.7512	0.53
A129			102424	1.423	0.993	0.026	4.77	3.1	0.7564	0.61
A130			101328	1.771	1.107	0.029	4.715	2.6	0.7663	0.53
A131			92863	1.603	0.893	0.028	5.917	2.3	0.7576	0.59
A132			31328	0.194	0.280	0.002	2.342	3.2	0.7871	1.5
A133			67182	0.572	0.598	0.001	3.176	2.3	0.772	1.4
A134			73644	0.539	0.679	0.001	2.659	4.6	0.7758	1.4
A135			42265	0.810	0.349	0.022	7.323	3.2	0.7219	1.6
A136			138074	1.873	1.024	0.019	6.923	3.3	0.7384	1.4
A137			64875	1.688	0.536	0.019	9.827	2.3	0.7079	1.3
A138			113585	1.545	0.978	0.026	5.071	4.9	0.7575	1.3
A139			65458	2.136	0.532	0.021	12.23	2.6	0.6845	1.3
A140			90684	1.146	0.779	0.032	4.756	3.7	0.75	1.3
A141			29438	0.132	0.266	0.001	1.644	4.7	0.7801	1.7
A142			45686	0.305	0.403	0.007	2.523	2.9	0.7891	1.4
A143			127852	0.804	1.109	0.007	2.405	2.1	0.7659	1.3
A144			87191	1.260	0.764	0.031	5.357	3.2	0.7446	1.3
A145			68485	0.556	0.605	0.014	3.038	2.4	0.7622	1.4
A151			58856	1.096	0.509	0.028	6.922	2.5	0.7282	1.4
A152			56623	1.199	0.485	0.030	7.905	2.2	0.7241	1.4
A153			110123	1.004	0.961	0.025	3.428	2.3	0.7772	1.3
A154			38114	0.644	0.339	0.014	6.231	2.3	0.7414	1.7

A155			49473	0.931	0.430	0.026	7.061	2.9	0.7358	1.4
A156			67404	1.516	0.576	0.019	8.415	3.2	0.7268	1.4
A157			89767	1.108	0.797	0.014	4.622	2.5	0.7569	1.3
A158			46855	1.650	0.387	0.029	13.14	2.5	0.686	1.6
A159			4726	1.021	0.017	0.007	74.61	2.4	0.1143	4.9
A160			5206	1.068	0.022	0.006	69.96	2.7	0.1669	4.2
A161			4938	1.146	0.017	0.005	80.46	2.4	0.1041	3.7
A162			5029	1.175	0.017	0.002	80.1	2.4	0.1029	4.4
A163			3964	0.836	0.014	0.002	73.62	2.5	0.1323	5
A164			4118	0.957	0.015	0.003	78.82	2.5	0.1211	4.9
A165			3369	0.743	0.012	0.002	75.45	2.3	0.1222	5
A166			4222	0.976	0.015	0.004	79.13	2.3	0.1063	5.1
A167			4065	0.905	0.014	0.005	79.55	2.6	0.103	6.6
A168			4601	1.043	0.017	0.007	78.13	2.5	0.123	4.2
A169			4683	1.086	0.017	0.008	79.48	2.4	0.1214	6.2
A222	Sua.5	Saddle dolomite SD1	4712	0.062	0.050	0.409	4.401	2.9	0.8102	1.7
A223			2988	0.075	0.032	0.344	8.4	3.9	0.8542	2.6
A224			1444	0.075	0.015	0.483	17.23	4.8	0.7922	4.7
A225			3314	0.067	0.035	0.418	6.764	5.6	0.8394	2.6
A226			2596	0.078	0.027	0.365	9.996	4.8	0.8187	2.9
A227			2774	0.070	0.028	0.326	8.476	3.1	0.7913	3
A228			4563	0.037	0.048	0.276	2.731	3.3	0.8531	2.3
A229			2739	0.037	0.029	0.286	4.567	3.2	0.841	3.4
A230			3748	0.035	0.039	0.319	3.129	5.8	0.8265	2.3
A231			6474	0.041	0.067	0.310	2.123	4.9	0.8195	1.8
A232		Saddle dolomite SD2	5412	0.039	0.058	0.414	2.408	4.2	0.8261	2.7
A233			6532	0.022	0.079	0.193	0.9812	26.4	0.8547	3.2
A234			404	0.037	0.005	0.530	30.92	6.6	0.6242	10
A235			2286	0.040	0.024	0.368	5.78	5.9	0.8198	3.1
A236			7451	0.081	0.079	0.341	3.628	3.0	0.8425	1.3
A237			146611	0.570	1.580	0.065	1.302	2.0	0.867	0.43
A243			6168	0.091	0.067	0.363	4.909	2.9	0.7879	1.9
A244			1025	0.041	0.010	0.308	13.31	11.0	0.697	5.8
A245			4364	0.043	0.047	0.310	3.294	5.0	0.8101	2.3
A246			5863	0.046	0.063	0.434	2.632	4.2	0.8402	2.2
A247			1319	0.040	0.014	0.452	10.15	5.3	0.7545	3.8
A248			8597	0.037	0.090	0.374	1.46	5.3	0.8387	1.7
A249			12234	0.033	0.128	0.359	0.8985	2.7	0.827	1.3
A252			23639	0.082	0.264	0.032	1.13	3.4	0.795	1.3
A253			1968	0.035	0.021	0.410	5.962	4.2	0.8236	3
A254			7605	0.027	0.082	0.208	1.167	2.6	0.8294	1.6
A255			10752	0.037	0.112	0.425	1.147	3.3	0.8062	1.3
A306		Saddle dolomite SD2	8941	0.108	0.086	0.000	5.251	10.1	0.8487	1.5
A307			8026	0.053	0.087	0.000	2.188	2.9	0.8466	1.8
A308			7183	0.131	0.083	0.000	5.912	4.3	0.8484	1.7

A309	Sp.4		11238	0.092	0.123	0.000	2.661	3.2	0.8514	1.5
A311			3426	0.153	0.037	0.000	14.67	5.0	0.8298	2.8
A312			3461	0.072	0.036	0.000	7.049	3.7	0.84	2.2
A313			5455	0.109	0.059	0.000	6.509	4.2	0.842	2.7
A315			7404	0.059	0.081	0.004	2.62	5.0	0.8455	1.7
A316			6282	0.204	0.067	0.000	10.95	2.7	0.8388	1.6
A317			16681	0.501	0.158	0.000	11.88	7.2	0.834	1.6
A318			3790	0.416	0.038	0.012	34.49	4.9	0.7889	2.5
A320		Saddle dolomite SD3	2936	0.152	0.031	0.026	16.8	3.3	0.8272	2.7
A322			15866	0.181	0.175	0.005	3.687	3.5	0.8571	1.2
A323			5936	0.080	0.065	0.020	4.352	3.9	0.8511	2
A327			142348	0.841	2.111	0.069	1.437	2.0	0.8771	0.42
A336			3516	0.244	0.037	0.005	22.52	3.6	0.8079	3.4
A337			5773	0.114	0.068	0.016	6.2	4.5	0.8558	1.7
A338			7789	0.132	0.087	0.020	5.403	3.5	0.8553	2
A339			7670	0.082	0.085	0.010	3.445	4.3	0.843	2.7
A340			32294	0.183	0.351	0.096	1.944	10.8	0.8508	1.3
A341			123631	0.359	1.208	0.134	1.066	9.1	0.8448	0.47
A342			169451	0.392	1.867	0.087	0.7532	8.0	0.8448	0.61
A344			448	0.617	0.003	0.001	450.6	8.0	0.3648	11

Table 3: Concentration of U-Pb and U-Th-Pb isotopes of host limestone, early dolomite matrix, saddle dolomites, blocky calcites, calcrete, and chert nodules sample by small-scale isochron (SSI) using LA-ICP-MS approach. Spelek- Sulauk areas. NE-Iraq-Kurdistan Region. (n = 190).