First series: Ooids from Malapa site (July 2013)

Sample: MP04 Ooid relative irradiation coordinate z: 39 mm Days after irradiation: 32.2
J-value: 0.008999 ± 0.000027 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	9.8	4.82E-13	5.9720	8.3E-03	0.03735	7.9E-05	0.00462	1.8E-05	0.02436	5.4E-05	0.01340	3.4E-05	460	3	30.8	743	23	2.4325	0.0218	0.0068	0.0002
2	10	4.51E-13	5.5774	4.8E-03	0.02595	3.8E-05	0.00067	1.4E-05	0.00411	1.3E-05	0.00053	9.7E-06	10950	386	21.4	1919	14	0.5906	0.0058	0.0026	0.0001
3	10.2	5.12E-13	6.3364	6.4E-03	0.02765	4.2E-05	0.00047	5.3E-06	0.00130	1.2E-05	0.00023	4.4E-06	28634	1055	22.8	2016	15	0.1751	0.0041	0.0018	0.0001
4	10.4	2.82E-13	3.4862	4.5E-03	0.01570	2.8E-05	0.00035	5.0E-06	0.00076	5.2E-06	0.00020	5.6E-06	18365	963	12.9	1971	16	0.1805	0.0033	0.0024	0.0001
5	10.7	1.21E-13	1.5023	2.5E-03	0.00738	2.1E-05	0.00026	6.9E-06	0.00096	9.9E-06	0.00018	7.6E-06	8790	744	6.1	1846	20	0.4857	0.0129	0.0037	0.0003
6	11	1.08E-13	1.3395	2.6E-03	0.00594	2.8E-05	0.00031	7.1E-06	0.00032	6.8E-06	0.00011	6.8E-06	12463	1665	4.9	1979	27	0.2000	0.0107	0.0058	0.0004
7	11.5	3.27E-14	0.4047	6.8E-04	0.00148	1.2E-05	0.00047	8.6E-06	0.00000	6.5E-06	0.00006	7.5E-06	7088	2326	1.2	2196	54	0.0000	0.0000	0.0364	0.0020

Sample: NHL 10/1 Ooid relative irradiation coordinate z: 36 mm Days after irradiation: 57.5
J-value: 0.008989 ± 0.000025 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	9.44	6.41E-15	0.0794	1.5E-04	0.00002	3.5E-06	0.00008	2.7E-06	0.00002	5.0E-06	0.00029	6.5E-06	279	12	0.0	0	5144	5.5047	4.6970	0.1465	0.0685
2	9.59	1.67E-12	20.6441	1.8E-02	0.02565	3.1E-05	0.01475	3.1E-05	0.01711	3.4E-05	0.07063	6.6E-05	302	1	26.6	131	112	4.0324	0.0306	0.0078	0.0002
3	9.73	2.43E-13	3.0065	2.3E-03	0.02671	5.4E-05	0.00171	1.5E-05	0.01418	2.4E-05	0.00324	1.3E-05	961	8	27.7	962	13	3.2083	0.0262	0.0049	0.0002
4	9.88	1.34E-13	1.6614	1.8E-03	0.01533	3.8E-05	0.00073	1.1E-05	0.00755	2.2E-05	0.00138	9.1E-06	1250	16	15.9	1008	15	2.9777	0.0315	0.0037	0.0002
5	10.02	1.07E-13	1.3251	1.7E-03	0.01317	3.1E-05	0.00067	6.8E-06	0.00686	1.9E-05	0.00127	9.7E-06	1077	16	13.7	914	15	3.1482	0.0318	0.0039	0.0001
6	10.17	6.78E-14	0.8391	1.5E-03	0.00806	2.2E-05	0.00040	7.5E-06	0.00407	1.9E-05	0.00078	8.0E-06	1110	23	8.4	947	19	3.0537	0.0431	0.0037	0.0002
7	10.31	4.31E-14	0.5338	9.1E-04	0.00437	1.5E-05	0.00022	5.5E-06	0.00203	1.4E-05	0.00042	4.8E-06	1328	31	4.5	1119	20	2.8079	0.0562	0.0040	0.0003
8	10.46	3.44E-14	0.4260	7.8E-04	0.00298	1.4E-05	0.00015	4.1E-06	0.00130	1.2E-05	0.00033	6.4E-06	1339	53	3.1	1256	34	2.6296	0.0659	0.0034	0.0003

Sample: NHL 10/2 Ooid relative irradiation coordinate z: 32 mm Days after irradiation: 56.2
J-value: 0.008909 ± 0.000026 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	9.6	7.65E-13	9.4712	4.5E-03	0.01768	2.5E-05	0.00786	2.0E-05	0.01217	2.8E-05	0.03212	3.8E-05	304	1	40.9	158	68	4.0567	0.1445	0.0129	0.0006
2	9.71	6.87E-14	0.8506	1.3E-03	0.00731	3.2E-05	0.00065	7.3E-06	0.00713	2.7E-05	0.00085	8.2E-06	1040	21	16.9	1007	26	5.7535	0.2173	0.0081	0.0004
3	9.82	5.04E-14	0.6243	8.6E-04	0.00461	2.3E-05	0.00035	3.2E-06	0.01320	3.5E-05	0.00055	7.1E-06	1195	33	10.7	1175	28	16.9637	0.6392	0.0064	0.0003
4	9.92	4.39E-14	0.5434	3.5E-04	0.00386	1.4E-05	0.00034	9.2E-06	0.00338	1.4E-05	0.00049	5.6E-06	1151	25	8.9	1195	24	5.1726	0.1937	0.0076	0.0006
5	10.03	1.23E-14	0.1519	2.8E-04	0.00113	9.7E-06	0.00009	3.5E-06	0.00085	9.2E-06	0.00017	4.2E-06	940	46	2.6	1083	53	4.4143	0.2146	0.0066	0.0007
6	10.14	1.23E-14	0.1517	2.9E-04	0.00099	5.9E-06	0.00008	2.1E-06	0.00068	5.6E-06	0.00014	4.4E-06	1116	72	2.3	1261	54	4.0573	0.1740	0.0061	0.0005
7	10.25	2.70E-14	0.3337	2.9E-04	0.00202	1.3E-05	0.00011	5.4E-06	0.00111	1.4E-05	0.00021	5.7E-06	1640	87	4.7	1433	40	3.2397	0.1570	0.0043	0.0005
8	10.36	2.02E-14	0.2500	3.5E-04	0.00151	1.0E-05	0.00010	3.8E-06	0.00083	1.0E-05	0.00016	4.0E-06	1595	77	3.5	1430	40	3.2551	0.1598	0.0053	0.0006
9	10.6	1.85E-14	0.2287	2.6E-04	0.00131	8.0E-06	0.00012	3.5E-06	0.00101	9.3E-06	0.00029	6.3E-06	825	32	3.0	1250	56	4.5479	0.2004	0.0063	0.0005
10	10.9	2.44E-14	0.3020	2.9E-04	0.00103	7.5E-06	0.00018	7.1E-06	0.00074	1.2E-05	0.00065	6.4E-06	483	9	2.4	1256	94	4.2040	0.2347	0.0067	0.0007
11	11.2	2.74E-14	0.3390	3.2E-04	0.00059	7.7E-06	0.00024	7.1E-06	0.00063	4.6E-06	0.00056	4.4E-06	629	10	1.4	2370	143	6.3301	0.3201	0.0280	0.0025
12	11.5	2.48E-13	3.0669	1.5E-03	0.00122	9.4E-06	0.00202	1.7E-05	0.00078	7.8E-06	0.01035	2.4E-05	306	1	2.8	780	1463	3.7816	0.1762	0.0102	0.0006

Sample: NHL 10/3-1 Ooid relative irradiation coordinate z: 38 mm Days after irradiation: 76.4
J-value: 0.008996 ± 0.000027 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	10.32	2.75E-16	0.0034	5.1E-05	0.00001	2.5E-06	-0.00001	2.3E-06	-0.00001	3.9E-06	0.00002	2.8E-06	171	64	0.3	0	2236	0.0000	0.0000	0.0000	0.0000
2	10.45	2.76E-15	0.0342	1.3E-04	0.00022	5.2E-06	-0.00001	3.7E-06	0.00004	3.1E-06	0.00004	2.2E-06	993	132	5.5	1249	164	1.6820	0.3287	0.0000	0.0000
3	10.59	8.87E-15	0.1098	1.7E-04	0.00086	4.4E-06	0.00006	2.3E-06	0.00017	5.8E-06	0.00012	3.5E-06	924	49	22.0	1041	52	1.6789	0.1678	0.0054	0.0006
4	10.73	1.43E-14	0.1776	3.0E-04	0.00147	8.3E-06	0.00012	3.4E-06	0.00031	5.1E-06	0.00018	5.8E-06	1004	61	37.3	1032	51	1.8822	0.1220	0.0070	0.0006
5	10.86	7.33E-15	0.0907	1.2E-04	0.00071	5.5E-06	0.00006	3.2E-06	0.00016	3.5E-06	0.00014	5.9E-06	654	53	18.0	882	107	1.9595	0.1469	0.0050	0.0008
6	11	6.01E-15	0.0744	1.1E-04	0.00066	4.4E-06	0.00006	2.2E-06	0.00010	4.1E-06	0.00010	4.4E-06	749	65	16.9	862	88	1.3773	0.1491	0.0069	0.0008

Sample: NHL 10/3-2 Ooid relative irradiation coordinate z: 35 mm Days after irradiation: 76.2
J-value: 0.008910 ± 0.000026 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	9.5	5.21E-13	6.4467	6.7E-03	0.00570	2.0E-05	0.00428	1.9E-05	0.00182	1.2E-05	0.02184	4.7E-05	305	1	8.7	331	338	2.79	0.13	0.0049	0.0003
2	9.64	4.89E-13	6.0517	7.1E-03	0.02124	4.4E-05	0.00431	2.4E-05	0.00684	2.0E-05	0.01819	3.7E-05	343	2	32.5	521	49	2.81	0.12	0.0053	0.0003
3	9.77	1.68E-13	2.0823	2.4E-03	0.01454	3.2E-05	0.00081	8.8E-06	0.00569	2.1E-05	0.00134	8.0E-06	1612	19	22.3	1294	14	3.42	0.15	0.0046	0.0003
4	9.91	9.13E-14	1.1301	1.4E-03	0.01160	3.8E-05	0.00061	8.2E-06	0.00753	1.9E-05	0.00104	1.1E-05	1128	24	17.8	898	20	5.68	0.25	0.0043	0.0003
5	10.05	5.32E-14	0.6590	9.3E-04	0.00819	2.4E-05	0.00034	4.7E-06	0.00223	1.4E-05	0.00084	6.5E-06	813	12	12.5	680	16	2.38	0.11	0.0026	0.0002
6	10.18	2.37E-14	0.2930	4.7E-04	0.00207	1.2E-05	0.00013	3.9E-06	0.00043	6.7E-06	0.00026	4.6E-06	1156	42	3.2	1200	35	1.84	0.11	0.0044	0.0004
7	10.32	7.68E-15	0.0950	2.8E-04	0.00065	7.5E-06	0.00003	3.8E-06	0.00018	5.8E-06	0.00007	2.7E-06	1398	104	1.0	1288	71	2.46	0.23	0.0029	0.0010
8	10.45	1.83E-14	0.2262	4.1E-04	0.00130	1.1E-05	0.00009	3.4E-06	0.00040	5.0E-06	0.00018	4.1E-06	1296	57	2.0	1425	51	2.71	0.15	0.0052	0.0006

Sample: NHL 10/3-3 Ooid relative irradiation coordinate z: 38 mm Days after irradiation: 56.4
J-value: 0.008996 ± 0.000026 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	9.5	7.00E-13	8.6624	2.5E-03	0.00601	2.1E-05	0.00611	1.3E-05	0.00390	2.1E-05	0.03005	4.3E-05	298	1	8.8	-85	508	3.84	0.22	0.0110	0.0007
2	9.61	2.57E-13	3.1872	2.4E-03	0.02434	3.6E-05	0.00275	1.3E-05	0.01436	2.2E-05	0.00840	2.9E-05	392	3	35.5	450	21	3.49	0.19	0.0059	0.0004
3	9.73	1.10E-13	1.3661	2.0E-03	0.01228	2.4E-05	0.00065	9.6E-06	0.01262	1.4E-05	0.00095	8.8E-06	1506	28	17.9	1071	15	6.09	0.34	0.0047	0.0004
4	9.84	7.70E-14	0.9537	1.2E-03	0.00848	2.5E-05	0.00046	4.0E-06	0.01699	4.0E-05	0.00080	7.0E-06	1260	24	12.3	1043	17	11.91	0.66	0.0044	0.0003
5	9.96	4.56E-14	0.5649	5.9E-04	0.00498	1.9E-05	0.00029	6.5E-06	0.00268	1.5E-05	0.00048	6.4E-06	1230	32	7.3	1040	24	3.18	0.18	0.0047	0.0004
6	10.07	3.97E-14	0.4917	6.1E-04	0.00387	1.2E-05	0.00017	5.7E-06	0.00192	1.1E-05	0.00033	5.4E-06	1531	47	5.6	1185	22	2.94	0.17	0.0034	0.0004
7	10.19	2.08E-14	0.2570	4.2E-04	0.00171	9.9E-06	0.00007	6.1E-06	0.00072	7.0E-06	0.00012	4.2E-06	2172	146	2.5	1405	36	2.49	0.15	0.0032	0.0007
8	10.3	1.26E-14	0.1557	4.2E-04	0.00103	7.2E-06	0.00005	3.0E-06	0.00055	8.5E-06	0.00010	4.4E-06	1554	129	1.5	1345	47	3.13	0.22	0.0031	0.0005
9	10.42	1.12E-14	0.1390	2.6E-04	0.00094	7.2E-06	0.00004	3.4E-06	0.00074	9.6E-06	0.00011	4.2E-06	1330	100	1.4	1284	58	4.63	0.31	0.0027	0.0006
10	10.53	2.43E-14	0.3005	2.7E-04	0.00205	1.3E-05	0.00010	4.8E-06	0.00110	9.0E-06	0.00015	4.2E-06	2050	110	3.0	1372	35	3.18	0.19	0.0043	0.0006
11	10.65	2.06E-14	0.2555	2.7E-04	0.00212	1.0E-05	0.00012	5.1E-06	0.00122	8.1E-06	0.00022	4.2E-06	1223	45	3.1	1089	30	3.42	0.20	0.0047	0.0006
12	10.8	8.20E-15	0.1015	2.0E-04	0.00086	6.9E-06	0.00007	3.6E-06	0.00044	6.2E-06	0.00010	5.5E-06	1057	121	1.2	1033	80	3.07	0.21	0.0071	0.0010

Sample: NHL 10/5-1 Ooid relative irradiation coordinate z: 34 mm Days after irradiation: 75.3
J-value: 0.008904 ± 0.000028 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	9.3	1.19E-15	0.014699	6.61E-05	-1.1E-05	2.35E-06	1.03E-05	1.77E-06	1.13E-05	3.34E-06	6.18E-05	4.02E-06	246	34	-0.05	2262.88	4294	0	0	0	0
2	9.4	6.72E-17	0.000831	6.39E-05	-6.2E-06	2.26E-06	-1.9E-07	1.79E-06	-3.7E-06	3.12E-06	7.16E-06	3.33E-06	120	620	-0.026	1871.12	3751	3.541236	8.02859	0.02917	0.67108
3	9.5	1.98E-13	2.454493	0.001941	0.001168	9.56E-06	0.004522	1.43E-05	0.006449	2.42E-05	0.008282	3.05E-05	306	2	5.148	693.67	1326	33.32594	1.60155	0.30762	0.01788
4	9.6	1.07E-13	1.326763	2.22E-03	0.003769	1.44E-05	0.007315	1.62E-05	0.016931	3.71E-05	0.004222	1.59E-05	325	3	29.91	422.851	118.8	27.04401	1.19206	0.20777	0.01146
5	9.7	2.55E-14	0.315136	4.89E-04	0.002864	1.31E-05	0.003011	2.36E-05	0.011174	2.76E-05	0.00048	1.06E-05	691	31	12.62	812.183	49.71	23.45637	1.04603	0.12213	0.00713
6	9.8	4.24E-14	0.524952	7.08E-04	0.006006	2.46E-05	0.007538	3.04E-05	0.036763	5.51E-05	0.001061	7.38E-06	526	10	26.47	536.016	31.35	37.01283	1.63059	0.14721	0.00822
7	9.9	9.09E-15	0.112513	3.95E-04	0.001661	1.56E-05	0.001192	1.42E-05	0.009113	3.21E-05	0.000132	5.28E-06	935	83	7.318	633.902	53.3	33.11819	1.63185	0.08452	0.00553
8	10	6.39E-15	0.079062	2.03E-04	0.000999	6.22E-06	0.000744	8.47E-06	0.004598	1.69E-05	9.1E-05	4.28E-06	937	98	4.403	720.88	63.98	27.72394	1.2822	0.08737	0.00547
9	10.1	6.32E-15	0.078286	1.78E-04	0.000732	8.88E-06	0.000528	6.89E-06	0.003042	1.19E-05	0.000112	4.62E-06	736	61	3.227	823.509	103.2	24.98972	1.32037	0.08297	0.00574
10	10.2	7.27E-15	0.08995	1.38E-04	0.000841	6.64E-06	0.000495	1.03E-05	0.003306	1.75E-05	9.58E-05	6.23E-06	998	139	3.709	937.758	95.58	23.62813	1.14881	0.06788	0.00518
11	10.4	5.90E-15	0.073033	9.86E-05	0.000481	6.42E-06	0.000247	5.62E-06	0.001325	1.29E-05	3.73E-05	4.95E-06	2085	719	2.12	1405.17	108.5	16.50413	0.96873	0.05952	0.00498
12	10.7	2.02E-14	0.249565	2.70E-04	0.00117	9.08E-06	0.000625	3.96E-06	0.00263	1.77E-05	0.000177	4.75E-06	1478	81	5.154	1683.35	54.19	13.45728	0.66693	0.06039	0.00358

Sample: NHL 10/5-3 Ooid relative irradiation coordinate z: 33 mm Days after irradiation: 57.3
J-value: 0.008984 ± 0.000026 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	9.3	1.19E-15	0.0147	6.6E-05	-0.00001	2.4E-06	0.00001	1.8E-06	0.00001	3.3E-06	0.00006	4.0E-06	246	32	-0.1	2270	3961	0.0	0.0	0.0000	0.0000
2	9.4	6.72E-17	0.0008	6.4E-05	-0.00001	2.3E-06	0.00000	1.8E-06	0.00000	3.1E-06	0.00001	3.3E-06	120	1018	0.0	1878	3441	3.6	8.1	0.0292	0.6711
3	9.5	1.98E-13	2.4545	1.9E-03	0.00117	9.6E-06	0.00452	1.4E-05	0.00645	2.4E-05	0.00828	3.1E-05	306	2	7.3	697	1493	33.7	2.3	0.3077	0.0244

4	9.7	2.55E-14	0.3151	4.9E-04	0.00286	1.3E-05	0.00301	2.4E-05	0.01117	2.8E-05	0.00048	1.1E-05	691	30	18.0	816	53	23.7	1.6	0.1221	0.0097
5	9.8	4.24E-14	0.5250	7.1E-04	0.00601	2.5E-05	0.00754	3.0E-05	0.03676	5.5E-05	0.00106	7.4E-06	526	10	37.8	539	31	37.4	2.5	0.1472	0.0114
6	9.9	9.09E-15	0.1125	4.0E-04	0.00166	1.6E-05	0.00119	1.4E-05	0.00911	3.2E-05	0.00013	5.3E-06	936	80	10.4	637	60	33.5	2.3	0.0845	0.0072
7	10	6.39E-15	0.0791	2.0E-04	0.00100	6.2E-06	0.00074	8.5E-06	0.00460	1.7E-05	0.00009	4.3E-06	937	97	6.3	724	57	28.0	1.9	0.0874	0.0072
8	10.1	6.32E-15	0.0783	1.8E-04	0.00073	8.9E-06	0.00053	6.9E-06	0.00304	1.2E-05	0.00011	4.6E-06	737	63	4.6	827	86	25.2	1.8	0.0830	0.0073
9	10.2	7.27E-15	0.0900	1.4E-04	0.00084	6.6E-06	0.00049	1.0E-05	0.00331	1.7E-05	0.00010	6.2E-06	999	137	5.3	942	93	23.9	1.6	0.0679	0.0064
10	10.4	5.90E-15	0.0730	9.9E-05	0.00048	6.4E-06	0.00025	5.6E-06	0.00133	1.3E-05	0.00004	5.0E-06	2085	696	3.0	1411	106	16.7	1.3	0.0595	0.0059
11	10.7	2.02E-14	0.2496	2.7E-04	0.00117	9.1E-06	0.00063	4.0E-06	0.00263	1.8E-05	0.00018	4.7E-06	1478	75	7.4	1690	53	13.6	0.9	0.0604	0.0048

Monitors for first series: all single step fusion, laser at 14 A, 5 min. heating

^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs		relative z coordinate (mm)	days after irradiation
6.82E-13	8.447	6.1E-03	0.2217	1.3E-04	0.06370	7.8E-05	0.30284	2.6E-04	0.000627	9.3E-06	MMhb_J_1_1step	41	28.7
5.97E-13	7.392	5.9E-03	0.1926	1.6E-04	0.05395	6.7E-05	0.24276	1.4E-04	0.000413	8.3E-06	MMhb_D_1_1step	-1	32.7
5.83E-13	7.219	5.7E-03	0.1917	1.6E-04	0.05761	9.3E-05	0.24171	2.4E-04	0.000467	8.3E-06	MMhb_D_2_1step	-1	32.7
5.70E-13	7.060	7.4E-03	0.1865	1.8E-04	0.04279	1.1E-04	0.23348	2.0E-04	0.000474	7.4E-06	MMhb_J_2_1step	41	32.8
1.25E-12	15.483	1.1E-02	0.1638	1.4E-04	0.25021	1.7E-04	0.25894	1.7E-04	0.00133	8.2E-06	HB3GR_E_2_1step	0	32.8
1.94E-12	23.969	1.2E-02	0.2666	1.9E-04	0.14967	1.7E-04	0.11235	7.9E-05	0.001078	9.6E-06	HB3GR_K_2_1step	42	32.8
1.16E-12	14.406	1.0E-02	0.1570	7.9E-05	0.24580	1.6E-04	0.27816	1.3E-04	0.000323	5.6E-06	HB3GR_E_1_1step	0	28.6
8.21E-13	10.167	1.0E-02	0.1129	1.2E-04	0.16581	1.9E-04	0.18994	1.8E-04	0.000357	6.9E-06	HB3GR_K_1_1step	42	29.7
7.36E-13	9.114	9.9E-03	4.1640	3.7E-03	0.74138	8.2E-04	0.10490	1.1E-04	0.005918	2.5E-05	FCs_I_3_1step	40	32.9
2.61E-13	3.233	5.3E-03	1.4908	1.6E-03	0.25067	4.4E-04	0.02136	4.8E-05	0.001688	1.3E-05	FCs_C_3_1step	-2	32.9
2.86E-13	3.542	5.5E-03	1.4721	1.5E-03	0.27078	4.0E-04	0.04664	7.7E-05	0.003019	1.3E-05	FCs_C_2_1step	-2	32.9
5.82E-13	7.206	1.4E-02	2.9283	4.3E-03	0.49012	8.6E-04	0.04713	1.0E-04	0.006776	2.6E-05	FCs_I_2_1step	40	32.9

Second series (Sterkfontein and Rising Star, November 2014)

Sample: BH2-5-2 Ooid relative irradiation coordinate z: 5.6 mm Days after irradiation: 52.6

J-value: 0.002503 ± 0.000006 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	9.7	6.79E-14	0.6514	3.5E-04	0.00117	5.5E-06	0.00038	2.2E-06	0.00433	1.7E-05	0.00113	8.2E-06	598	9	3.3	968	39	22.0	8.1	0.0187	0.0079
2	9.91	2.56E-13	2.4568	5.1E-03	0.00316	1.4E-05	0.00038	4.8E-06	0.04204	8.7E-05	0.00072	7.1E-06	3714	106	9.0	1896	28	80.6	29.6	0.0103	0.0043
3	10.12	2.16E-13	2.0748	2.5E-04	0.00304	1.2E-05	0.00037	5.9E-06	0.18074	5.9E-05	0.00151	9.3E-06	1566	69	12.5	1743	34	407.5	149.8	0.0056	0.0023
4	10.33	3.43E-13	3.2850	4.5E-04	0.00421	1.2E-05	0.00048	5.3E-06	0.30224	1.2E-04	0.00204	9.7E-06	1883	98	12.0	1982	31	508.9	187.1	0.0053	0.0022
5	10.54	4.30E-13	4.1223	6.5E-04	0.00486	1.1E-05	0.00016	3.5E-06	0.03374	3.7E-05	0.00031	5.1E-06	15092	781	13.9	2061	16	41.5	15.2	0.0029	0.0012
6	10.75	4.38E-13	4.1953	6.3E-04	0.00482	1.5E-05	0.00016	4.3E-06	0.00074	5.6E-06	0.00038	4.4E-06	11503	254	13.8	2065	19	0.90	0.33	0.0023	0.0010
7	10.95	3.71E-13	3.5566	8.0E-04	0.00415	1.5E-05	0.00011	3.3E-06	0.00041	6.8E-06	0.00018	6.7E-06	19958	1373	11.9	2060	21	0.59	0.22	0.0022	0.0009
8	11.16	2.52E-13	2.4184	3.0E-03	0.00282	7.4E-06	0.00007	5.0E-06	0.00030	4.4E-06	0.00008	5.8E-06	31840	5149	8.1	2065	18	0.63	0.23	0.0023	0.0011
9	11.4	8.18E-14	0.7841	1.9E-04	0.00095	7.1E-06	0.00004	3.0E-06	0.00016	3.3E-06	0.00009	3.9E-06	9532	868	2.7	1997	38	0.99	0.37	0.0037	0.0017
10	11.75	1.74E-13	1.6722	5.0E-04	0.00218	9.0E-06	0.00012	2.4E-06	0.00021	4.1E-06	0.00011	4.0E-06	16445	1274	6.2	1922	23	0.55	0.21	0.0059	0.0025
11	12	6.22E-14	0.5958	2.5E-04	0.00075	6.2E-06	0.00005	2.0E-06	0.00005	2.9E-06	0.00007	3.3E-06	9116	855	2.1	1945	44	0.39	0.15	0.0060	0.0026
12	12.5	1.27E-13	1.2190	3.8E-04	0.00151	7.0E-06	0.00009	3.7E-06	0.00010	3.7E-06	0.00005	3.9E-06	23075	3339	4.3	1986	25	0.37	0.14	0.0066	0.0029

Sample: BH2-5-4 Ooid relative irradiation coordinate z: 5.6 mm Days after irradiation: 35.6

J-value: 0.002503 ± 0.000006 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	9.6	7.50E-15	0.0719	7.9E-05	0.00026	4.6E-06	0.00002	3.1E-06	0.00106	6.4E-06	0.00013	4.1E-06	592	36	0.5	536	93	17.1	6.5	0.0000	0.0000
2	9.82	2.47E-13	2.3632	9.9E-04	0.00395	1.1E-05	0.00024	3.4E-06	0.02595	3.7E-05	0.00060	4.2E-06	4183	75	7.8	1592	15	27.9	10.5	0.0042	0.0018
3	10.04	4.74E-13	4.5444	8.1E-04	0.00626	1.6E-05	0.00034	4.9E-06	0.29419	9.4E-05	0.00111	4.5E-06	4957	356	12.3	1904	20	214.5	81.2	0.0037	0.0016
4	10.25	6.77E-13	6.4892	9.0E-04	0.00757	1.6E-05	0.00021	6.0E-06	0.17675	8.7E-05	0.00060	5.0E-06	13324	1070	14.9	2100	15	102.0	38.6	0.0021	0.0009
5	10.47	1.01E-12	9.6991	2.7E-03	0.01118	1.9E-05	0.00016	3.8E-06	0.00290	9.2E-06	-0.00001	3.8E-06	-980925	2.E+07	22.0	2093	15	1.089	0.413	0.0018	0.0008
6	10.69	9.47E-13	9.0734	1.3E-03	0.01056	1.9E-05	0.00015	2.8E-06	0.00126	8.6E-06	-0.00004	3.0E-06	-254091	41941	20.7	2083	14	0.501	0.190	0.0019	0.0008
7	10.91	5.16E-13	4.9471	1.5E-03	0.00573	1.2E-05	0.00009	4.2E-06	0.00059	5.3E-06	0.00006	4.2E-06	89568	14902	11.3	2083	15	0.435	0.165	0.0019	0.0008

8	11.13	1.17E-13	1.1168	4.6E-04	0.00130	6.3E-06	0.00004	4.4E-06	0.00017	3.0E-06	0.00003	3.1E-06	33248	6971	2.6	2071	26	0.534	0.204	0.0030	0.0016
9	11.35	7.78E-14	0.7461	3.2E-04	0.00083	9.6E-06	0.00001	3.4E-06	0.00014	2.5E-06	0.00001	3.9E-06	78052	446475	1.6	2130	62	0.704	0.269	0.0016	0.0013
10	11.56	8.15E-14	0.7811	3.4E-04	0.00090	5.8E-06	0.00001	2.1E-06	0.00021	4.2E-06	0.00000	3.4E-06	672376	2.E+07	1.8	2099	35	0.962	0.368	0.0013	0.0009
11	11.78	1.63E-13	1.5584	3.8E-04	0.00178	8.0E-06	0.00007	3.6E-06	0.00038	5.9E-06	0.00003	2.5E-06	57986	11551	3.5	2100	25	0.907	0.345	0.0046	0.0020
12	12	5.24E-14	0.5019	6.4E-04	0.00060	6.2E-06	0.00001	4.0E-06	0.00009	3.9E-06	0.00000	4.8E-06	310424	2.E+07	1.2	2055	54	0.650	0.256	0.0011	0.0020

Sample: BH2-12 Ooid relative irradiation coordinate z: 6.3 mm Days after irradiation: 52.8
J-value: 0.002504 ± 0.000006 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	9.7	3.39E-13	3.2542	1.2E-02	0.00633	1.7E-05	0.00051	9.5E-06	0.00242	8.8E-06	0.00126	9.3E-06	2667	39	40.7	1384	21	2.251	0.748	0.0055	0.0021
2	9.91	3.05E-13	2.9204	2.0E-03	0.00449	7.5E-06	0.00027	2.8E-06	0.00141	6.3E-06	0.00084	6.4E-06	3587	52	28.9	1658	13	1.856	0.617	0.0032	0.0012
3	10.12	1.51E-13	1.4478	2.9E-04	0.00199	8.4E-06	0.00012	3.3E-06	0.00050	6.8E-06	0.00032	4.4E-06	4744	129	12.8	1809	22	1.472	0.491	0.0040	0.0016
4	10.33	1.20E-13	1.1499	2.5E-04	0.00149	9.2E-06	0.00009	3.7E-06	0.00026	4.9E-06	0.00023	5.3E-06	5248	230	9.6	1879	32	1.027	0.345	0.0039	0.0015
5	10.45	3.21E-14	0.3073	6.8E-04	0.00046	5.6E-06	0.00003	3.0E-06	0.00009	4.4E-06	0.00009	4.5E-06	3466	342	3.0	1680	63	1.100	0.391	0.0038	0.0017
6	10.75	1.57E-14	0.1505	1.5E-04	0.00023	4.1E-06	0.00002	3.7E-06	0.00004	2.8E-06	0.00005	5.2E-06	2963	644	1.5	1634	99	0.939	0.360	0.0054	0.0032
7	10.95	2.71E-14	0.2601	1.8E-04	0.00038	5.5E-06	0.00004	2.8E-06	0.00008	4.5E-06	0.00007	4.4E-06	3849	500	2.5	1706	75	1.182	0.428	0.0077	0.0033
8	11.16	8.37E-15	0.0802	1.6E-04	0.00010	3.2E-06	0.00001	2.0E-06	0.00002	2.9E-06	0.00003	4.5E-06	2532	1119	0.6	1898	188	1.277	0.611	0.0049	0.0031
9	11.37	3.04E-15	0.0292	4.6E-05	0.00007	2.9E-06	-0.00001	3.3E-06	0.00000	3.4E-06	0.00000	4.0E-06	-20173	48069	0.4	1313	208	0.203	0.697	0.0000	0.0000

Sample: BH3-4-1 Ooid relative irradiation coordinate z: 7.0 mm Days after irradiation: 38.6
J-value: 0.002504 ± 0.000006 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	10.05	6.36E-15	0.0610	3.5E-05	0.00052	3.3E-06	0.00001	2.5E-06	0.00007	3.4E-06	0.00001	3.2E-06	4320	30892	0.6	441	28	0.589	0.194	0.0030	0.0016
2	10.27	7.60E-14	0.7286	1.4E-04	0.00349	8.0E-06	0.00008	3.0E-06	0.00031	5.1E-06	0.00013	4.1E-06	5915	382	4.3	732	8	0.395	0.122	0.0019	0.0007
3	10.49	3.32E-13	3.1822	4.1E-04	0.00620	1.7E-05	0.00012	4.4E-06	0.00044	3.7E-06	0.00008	2.8E-06	43787	3333	7.6	1493	14	0.313	0.096	0.0021	0.0008
4	10.72	7.22E-13	6.9201	9.1E-04	0.00871	1.5E-05	0.00021	4.7E-06	0.00062	6.9E-06	0.00015	4.2E-06	48272	2652	10.6	1979	14	0.316	0.097	0.0027	0.0010
5	10.94	1.17E-12	11.2373	1.0E-03	0.01311	2.0E-05	0.00034	4.8E-06	0.00090	5.3E-06	0.00054	6.1E-06	21651	472	16.3	2061	14	0.307	0.094	0.0023	0.0008
6	11.16	3.90E-12	37.3836	1.6E-03	0.04317	3.5E-05	0.00274	1.0E-05	0.00233	8.5E-06	0.00900	1.3E-05	4287	12	53.6	2003	12	0.241	0.074	0.0032	0.0011
7	11.38	4.71E-13	4.5174	1.1E-03	0.00541	1.4E-05	0.00045	3.1E-06	0.00018	3.3E-06	0.00142	7.6E-06	3279	34	6.7	1930	19	0.148	0.046	0.0045	0.0016
8	11.61	1.91E-14	0.1835	9.9E-05	0.00020	4.0E-06	0.00012	4.6E-06	0.00005	3.6E-06	0.00032	5.0E-06	594	18	0.2	1393	197	1.046	0.380	0.0370	0.0136
9	11.83	6.74E-15	0.0647	1.4E-04	0.00008	3.3E-06	0.00005	3.0E-06	0.00001	3.7E-06	0.00013	3.9E-06	515	29	0.1	1117	426	0.539	0.536	0.0423	0.0166

Sample: BH3-4-2 Ooid relative irradiation coordinate z: 7.0 mm Days after irradiation: 52.9
J-value: 0.002504 ± 0.000006 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	9.7	5.87E-14	0.5623	1.3E-04	0.00114	7.4E-06	0.00015	4.2E-06	0.00025	5.5E-06	0.00021	4.4E-06	2796	111	34.6	1347	31	1.30	0.52	0.0121	0.0056
2	9.91	5.63E-14	0.5397	5.4E-04	0.00054	5.1E-06	0.00008	4.5E-06	0.00027	4.5E-06	0.00015	3.1E-06	3672	150	16.2	2173	51	2.99	1.20	0.0114	0.0054
3	10.12	3.70E-14	0.3547	4.6E-03	0.00046	3.7E-06	0.00008	5.4E-06	0.00086	7.0E-06	0.00003	1.8E-05	13314	3.E+06	13.9	1933	101	11.16	4.47	0.0201	0.0098
4	10.33	4.11E-14	0.3940	1.5E-04	0.00049	3.0E-06	0.00009	3.8E-06	0.00080	4.0E-06	0.00018	4.9E-06	2315	129	14.7	1852	40	9.72	3.89	0.0143	0.0067
5	10.54	2.22E-14	0.2133	1.6E-04	0.00029	4.2E-06	0.00000	2.0E-06	0.00032	4.7E-06	-0.00004	4.8E-06	-6134	2537	8.9	1936	68	6.34	2.55	0.0000	0.0000
6	10.75	1.96E-14	0.1879	1.3E-04	0.00024	3.7E-06	0.00003	2.9E-06	0.00018	3.8E-06	0.00003	3.0E-06	7556	2195	7.3	1921	80	4.33	1.75	0.0113	0.0060
7	10.95	1.26E-14	0.1212	1.0E-04	0.00015	3.3E-06	0.00002	2.8E-06	0.00013	4.0E-06	0.00002	4.4E-06	5904	21406	4.4	1972	124	5.24	2.15	0.0099	0.0062

Sample: BH2-5-1 mudstone relative irradiation coordinate z: 0.7 mm Days after irradiation: 31.7
J-value: 0.002498 ± 0.000005 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	9.7	3.62E-13	3.4725	8.2E-04	0.00476	1.5E-05	0.00014	4.8E-06	0.00067	5.8E-06	0.00015	3.6E-06	23793	1074	44.9	1868	17	0.544	0.188	0.0030	0.0012
2	10	3.83E-13	3.6751	1.6E-03	0.00392	9.3E-06	0.00010	3.3E-06	0.00047	4.2E-06	0.00010	3.9E-06	39990	3234	36.1	2178	17	0.464	0.160	0.0027	0.0011
3	10.3	9.89E-14	0.9483	2.4E-04	0.00144	9.7E-06	0.00003	2.9E-06	0.00012	2.7E-06	0.00004	2.8E-06	21896	2752	13.6	1752	30	0.333	0.116	0.0022	0.0010
4	10.6	2.92E-14	0.2802	8.3E-05	0.00038	4.5E-06	0.00002	2.3E-06	0.00002	3.5E-06	0.00002	2.7E-06	14198	4697	3.6	1865	57	0.161	0.103	0.0053	0.0026

5	10.9	9.06E-15	0.0868	9.5E-05	0.00012	3.5E-06	0.00001	3.1E-06	0.00001	3.0E-06	0.00000	3.7E-06	61696	708284	1.1	1880	154	0.322	0.266	0.0096	0.0086
6	11.2	3.44E-15	0.0330	5.1E-05	0.00004	3.4E-06	0.00000	3.3E-06	-0.00001	3.4E-06	0.00002	4.7E-06	1901	18974	0.4	1711	460	0.000	0.000	0.0000	0.0000
7	11.5	1.58E-15	0.0151	6.1E-05	0.00003	4.6E-06	0.00003	4.7E-06	0.00003	4.7E-06	0.00001	4.0E-06	1327	137316	0.3	1200	782	3.782	2.363	0.1133	0.0739

Sample: BH2-5-3 mudstone relative irradiation coordinate z: 0.7 mm Days after irradiation: 42.8
J-value: 0.002497 +/- 0.000006 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	9.6	2.11E-13	2.0245	5.1E-04	0.00276	7.6E-06	0.00019	3.0E-06	0.00035	3.3E-06	0.00063	6.2E-06	3322	63	33.0	1779	18	0.613	0.219	0.0033	0.0013
2	9.82	3.05E-13	2.9213	3.2E-04	0.00274	9.9E-06	0.00015	4.5E-06	0.00027	4.2E-06	0.00046	4.6E-06	6585	130	32.7	2294	24	0.485	0.174	0.0032	0.0013
3	10.04	1.54E-13	1.4772	2.5E-04	0.00157	7.2E-06	0.00022	5.6E-06	0.00019	2.7E-06	0.00088	5.9E-06	1729	22	18.8	1959	29	0.586	0.210	0.0046	0.0019
4	10.25	7.83E-14	0.7504	2.1E-04	0.00061	4.8E-06	0.00022	2.8E-06	0.00005	3.7E-06	0.00101	6.0E-06	764	9	7.3	1918	64	0.360	0.147	0.0060	0.0025
5	10.47	4.20E-13	4.0289	4.4E-04	0.00015	2.8E-06	0.00254	7.7E-06	-0.00001	3.0E-06	0.01347	2.0E-05	309	1	1.8	2095	3432	0.000	0.000	0.0425	0.0174
6	10.69	2.38E-13	2.2857	4.4E-04	0.00042	5.6E-06	0.00135	1.0E-05	0.00000	3.4E-06	0.00678	1.4E-05	348	1	5.0	1947	582	0.043	0.095	0.0299	0.0122
7	10.91	1.19E-13	1.1449	1.8E-04	0.00007	2.1E-06	0.00071	9.1E-06	-0.00002	2.4E-06	0.00372	1.0E-05	318	2	0.8	2324	3436	0.000	0.000	0.0462	0.0192
8	11.13	5.62E-14	0.5389	2.5E-04	0.00004	2.0E-06	0.00033	2.9E-06	0.00006	4.1E-06	0.00171	8.6E-06	326	3	0.5	2504	3968	7.326	3.064	0.0517	0.0221
9	11.35	5.10E-14	0.4891	7.7E-05	0.00002	3.5E-06	0.00029	5.8E-06	0.00000	2.7E-06	0.00162	5.9E-06	312	2	0.2	2458	6122	0.928	1.848	0.0000	0.0000
10	11.56	2.52E-14	0.2414	1.2E-04	-0.00001	1.8E-06	0.00015	2.1E-06	0.00000	3.5E-06	0.00081	6.8E-06	308	5	-0.1	0	7502	0.000	0.000	0.0000	0.0000
11	11.78	1.96E-14	0.1881	1.4E-04	0.00000	2.9E-06	0.00011	3.9E-06	-0.00001	2.5E-06	0.00060	7.1E-06	323	7	0.0	0	11540	13.47	52.01	0.0000	0.0000
12	12	2.21E-14	0.2118	1.4E-04	0.00000	2.3E-06	0.00013	3.6E-06	0.00002	3.5E-06	0.00073	7.9E-06	298	6	0.0	666	10532	0.000	0.000	0.0000	0.0000

Sample: BH2-12 mudstone relative irradiation coordinate z: 1.4 mm Days after irradiation: 31.9
J-value: 0.002498 ± 0.000006 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	9.64	7.53E-14	0.7219	2.2E-04	0.00209	1.1E-05	0.00012	5.0E-06	0.00982	2.0E-05	0.00019	4.7E-06	4095	223	5.7	1072	21	18.43	5.89	0.0051	0.0019
2	9.78	7.12E-13	6.8299	1.9E-03	0.00761	1.1E-05	0.00036	6.4E-06	0.02848	3.1E-05	0.00041	7.7E-06	18032	745	20.6	2119	14	14.67	4.69	0.0048	0.0018
3	10.11	1.28E-12	12.3162	7.8E-04	0.01202	1.9E-05	0.00039	8.8E-06	0.02696	3.5E-05	0.00028	5.1E-06	47636	1942	32.6	2298	15	8.77	2.80	0.0036	0.0013
4	10.35	4.62E-13	4.4324	6.7E-04	0.00629	1.2E-05	0.00028	5.9E-06	0.01272	1.7E-05	0.00015	3.5E-06	31124	1406	17.1	1833	14	7.90	2.52	0.0050	0.0019
5	10.58	2.71E-13	2.5940	4.2E-04	0.00393	1.5E-05	0.00020	3.9E-06	0.00887	1.5E-05	0.00021	4.4E-06	13027	551	14.4	1745	20	8.83	2.82	0.0053	0.0020
6	10.82	1.15E-13	1.1047	2.1E-04	0.00147	4.9E-06	0.00007	3.8E-06	0.00202	6.3E-06	0.00012	3.8E-06	9427	591	4.0	1877	19	5.35	1.71	0.0043	0.0017
7	11.05	7.79E-14	0.7469	2.1E-04	0.00103	6.2E-06	0.00006	4.2E-06	0.00105	5.5E-06	0.00006	4.4E-06	13176	1975	2.8	1847	31	3.99	1.28	0.0064	0.0026
8	11.29	6.21E-14	0.5954	1.3E-04	0.00079	5.4E-06	0.00003	4.0E-06	0.00097	7.6E-06	0.00010	3.4E-06	6091	405	2.1	1864	35	4.81	1.54	0.0025	0.0012
9	11.53	1.71E-14	0.1640	1.5E-04	0.00021	3.4E-06	0.00001	3.4E-06	0.00032	4.4E-06	0.00005	3.8E-06	3443	596	0.6	1838	85	5.84	1.89	0.0014	0.0011
10	11.76	7.65E-15	0.0733	6.8E-05	0.00008	2.8E-06	0.00000	4.6E-06	0.00020	4.6E-06	0.00003	4.5E-06	2814	3692	0.2	2093	217	10.37	3.49	0.0000	0.0000

Sample: BH3-4 mudstone relative irradiation coordinate z: 2.1 mm Days after irradiation: 32.6
J-value: 0.002499 ± 0.000005 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	9.95	2.15E-14	0.2057	1.6E-04	0.00080	7.2E-06	0.00011	7.3E-06	0.00334	9.1E-06	0.00031	4.6E-06	698	21	2.5	569	39	16.5	6.4	0.0080	0.0038
2	10.18	7.60E-14	0.7284	3.3E-04	0.00248	9.5E-06	0.00021	5.8E-06	0.00938	1.8E-05	0.00036	5.0E-06	2088	58	7.6	889	16	15.0	5.8	0.0073	0.0033
3	10.41	8.48E-14	0.8132	1.4E-04	0.00165	6.1E-06	0.00012	5.1E-06	0.00829	2.3E-05	0.00011	3.7E-06	7702	536	5.1	1425	19	20.0	7.8	0.0074	0.0034
4	10.64	2.01E-13	1.9241	4.0E-04	0.00288	9.7E-06	0.00018	4.1E-06	0.02777	2.4E-05	0.00021	5.2E-06	10272	609	8.8	1764	18	38.7	15.1	0.0063	0.0028
5	10.86	1.86E-13	1.7786	4.5E-04	0.00282	1.1E-05	0.00014	4.0E-06	0.07315	4.0E-05	0.00025	4.3E-06	8655	722	8.7	1723	21	106.9	41.6	0.0047	0.0021
6	11.09	1.31E-13	1.2570	7.8E-04	0.00219	6.1E-06	0.00011	2.7E-06	0.08820	5.3E-05	0.00028	6.1E-06	5603	516	6.7	1627	19	170.3	66.3	0.0044	0.0020
7	11.32	1.53E-13	1.4702	1.3E-03	0.00286	8.6E-06	0.00016	5.1E-06	0.19739	5.9E-05	0.00041	6.7E-06	4960	671	8.8	1555	24	306.7	119.4	0.0051	0.0023
8	11.55	9.23E-13	8.8438	1.1E-03	0.01574	2.5E-05	0.00080	4.2E-06	0.78107	1.9E-04	0.00201	1.0E-05	5723	574	48.3	1623	16	213.3	83.1	0.0044	0.0019
9	11.77	4.00E-14	0.3836	9.3E-05	0.00052	6.5E-06	0.00011	3.3E-06	0.00016	4.7E-06	0.00046	3.8E-06	861	14	1.6	1439	80	1.206	0.479	0.0063	0.0028
10	12	3.77E-14	0.3611	2.9E-04	0.00065	5.5E-06	0.00007	3.5E-06	0.00020	4.1E-06	0.00016	5.2E-06	2389	158	2.0	1448	43	1.218	0.479	0.0090	0.0041

Sample: UW101-SO31 Peloid relative irradiation coordinate z: 7.7 mm Days after irradiation: 53.6
J-value: 0.002505 ± 0.000006 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	9.7	5.82E-14	0.5578	2.0E-04	0.00131	4.6E-06	0.00012	3.7E-06	0.00022	3.6E-06	0.00029	5.0E-06	2004	67	2.7	1173	20	0.997	0.411	0.0061	0.0029
2	9.91	3.72E-13	3.5623	9.3E-04	0.00378	1.3E-05	0.00027	4.1E-06	0.00048	4.8E-06	0.00064	5.7E-06	5752	96	7.8	2131	22	0.753	0.310	0.0051	0.0024
3	10.12	5.70E-13	5.4676	1.1E-03	0.00559	1.6E-05	0.00021	6.9E-06	0.00035	3.8E-06	0.00051	2.7E-06	11160	115	11.5	2210	20	0.370	0.152	0.0025	0.0012
4	10.33	8.26E-13	7.9191	1.1E-03	0.00869	1.3E-05	0.00020	4.3E-06	0.00025	4.7E-06	0.00031	4.8E-06	26323	785	17.9	2140	14	0.169	0.070	0.0020	0.0010
5	10.54	6.31E-13	6.0520	8.1E-04	0.00708	1.5E-05	0.00010	5.1E-06	0.00015	3.6E-06	0.00007	6.4E-06	83841	15567	14.6	2071	16	0.125	0.052	0.0016	0.0008
6	10.75	3.91E-13	3.7519	2.8E-03	0.00442	1.5E-05	0.00007	2.5E-06	0.00008	3.3E-06	0.00012	2.8E-06	33618	1595	9.1	2054	20	0.104	0.044	0.0013	0.0006
7	10.95	1.07E-12	10.2833	7.3E-04	0.01229	1.9E-05	0.00018	4.4E-06	0.00022	4.8E-06	0.00008	5.3E-06	130691	16854	25.3	2046	14	0.108	0.045	0.0017	0.0008
8	11.16	4.73E-13	4.5333	1.0E-03	0.00537	1.5E-05	0.00005	2.7E-06	0.00020	6.3E-06	0.00001	3.2E-06	666853	4.E+07	11.1	2060	17	0.221	0.092	0.0011	0.0005
9	11.37	2.40E-15	0.0230	8.3E-05	0.00004	3.4E-06	-0.00001	2.8E-06	0.00001	3.3E-06	-0.00004	4.8E-06	-658	212	0.1	2183	428	1.011	1.424	0.0000	0.0000

Sample: UW101-SO34 Peloid relative irradiation coordinate z: 8.4 mm Days after irradiation: 39.6
J-value: 0.002506 ± 0.000006 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	9.6	3.77E-14	0.3589	1.5E-04	0.00179	8.1E-06	0.00009	3.9E-06	0.00018	5.1E-06	0.00024	4.1E-06	1567	49	2.2	621	15	0.448	0.200	0.0029	0.0015
2	9.82	1.39E-12	13.2350	8.0E-04	0.02099	1.4E-05	0.00062	7.5E-06	0.00120	7.8E-06	0.00079	5.9E-06	17299	245	25.7	1700	10	0.259	0.114	0.0028	0.0014
3	10.04	1.97E-12	18.7663	3.9E-03	0.02009	1.9E-05	0.00035	4.4E-06	0.00056	4.7E-06	0.00031	5.4E-06	62058	2022	24.9	2180	13	0.126	0.056	0.0018	0.0009
4	10.25	1.32E-12	12.5599	7.3E-04	0.01469	2.1E-05	0.00021	4.7E-06	0.00028	3.4E-06	0.00020	3.7E-06	65365	2293	18.3	2070	13	0.088	0.039	0.0015	0.0008
5	10.47	7.18E-13	6.8381	4.2E-03	0.00834	2.0E-05	0.00015	4.9E-06	0.00009	4.6E-06	0.00004	5.5E-06	166651	63630	10.4	2022	15	0.048	0.022	0.0021	0.0011
6	10.69	8.22E-13	7.8308	1.1E-03	0.00973	3.8E-05	0.00017	2.4E-06	0.00016	6.3E-06	0.00007	4.7E-06	119267	16284	12.1	2000	23	0.075	0.034	0.0021	0.0010
7	10.9	2.52E-13	2.3979	2.4E-04	0.00306	1.1E-05	0.00007	2.7E-06	0.00015	4.3E-06	0.00003	4.3E-06	96810	132060	3.8	1967	19	0.222	0.099	0.0025	0.0013
8	11.12	1.04E-13	0.9923	3.3E-04	0.00128	7.2E-06	0.00003	3.6E-06	0.00026	4.0E-06	0.00003	3.3E-06	33965	9057	1.6	1945	28	0.934	0.412	0.0026	0.0015
9	11.34	3.70E-14	0.3527	1.3E-04	0.00042	4.9E-06	0.00005	3.2E-06	0.00052	4.9E-06	0.00015	4.6E-06	2359	133	0.5	1892	67	5.601	2.469	0.0061	0.0032
10	11.56	1.19E-14	0.1133	4.7E-04	0.00013	3.3E-06	0.00000	2.3E-06	0.00006	4.2E-06	-0.00003	3.8E-06	-3613	998	0.2	2235	131	2.049	0.983	0.0093	0.0163
11	11.78	1.51E-14	0.1437	1.6E-04	0.00019	4.4E-06	0.00000	4.9E-06	0.00002	3.4E-06	-0.00001	4.3E-06	-12278	249063	0.2	1937	108	0.412	0.265	0.0030	0.0152

Sample: UW101-SO39 Peloid relative irradiation coordinate z: 9.1 mm Days after irradiation: 39.8
J-value: 0.002507 ± 0.000006 Heating time: 5 min

Step #	A laser	^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	^{40}Ar/^{36}Ar	± 2SE	%^{39}Ar	Age Ma	± 95%	Ca/K	± 2SE	Cl/K	± 2SE
1	9.6	3.55E-15	0.0336	6.4E-05	0.00028	4.2E-06	0.00001	2.6E-06	0.00001	3.4E-06	0.00001	3.8E-06	3002	23168	0.3	430	61	0.150	0.151	0.0025	0.0024
2	9.82	1.06E-12	10.0401	1.0E-03	0.02084	3.1E-05	0.00062	7.7E-06	0.00173	6.5E-06	0.00086	9.3E-06	12008	240	21.7	1412	9	0.379	0.170	0.0028	0.0014
3	10.04	1.67E-12	15.8557	6.0E-03	0.01702	2.0E-05	0.00035	7.5E-06	0.00068	5.7E-06	0.00033	6.1E-06	50393	1827	17.8	2176	14	0.182	0.082	0.0021	0.0011
4	10.25	7.10E-13	6.7260	5.2E-04	0.00830	2.2E-05	0.00012	2.5E-06	0.00020	3.1E-06	0.00009	3.2E-06	81041	5810	8.7	2006	17	0.112	0.050	0.0015	0.0008
5	10.47	8.34E-13	7.8988	7.9E-04	0.01024	1.6E-05	0.00015	6.7E-06	0.00023	4.7E-06	0.00006	5.0E-06	129139	21115	10.7	1948	13	0.104	0.047	0.0018	0.0009
6	10.96	1.13E-12	10.6732	9.7E-04	0.01408	2.4E-05	0.00018	4.7E-06	0.00030	4.3E-06	0.00007	3.2E-06	169374	16489	14.6	1929	13	0.096	0.043	0.0015	0.0008
7	10.91	5.57E-13	5.2748	8.5E-04	0.00697	1.7E-05	0.00010	3.0E-06	0.00015	4.7E-06	0.00004	3.4E-06	137243	26208	7.2	1925	15	0.098	0.045	0.0016	0.0008
8	11.13	9.40E-13	8.8970	1.3E-03	0.01225	2.0E-05	0.00023	4.9E-06	0.00026	4.3E-06	0.00013	5.9E-06	69277	5990	12.7	1875	13	0.097	0.044	0.0021	0.0011
9	11.45	2.95E-13	2.7909	9.9E-04	0.00428	1.0E-05	0.00012	3.5E-06	0.00018	3.7E-06	0.00009	3.8E-06	31715	2473	4.4	1747	14	0.189	0.085	0.0031	0.0016
10	11.75	6.60E-14	0.6253	1.8E-04	0.00102	8.3E-06	0.00005	2.6E-06	0.00010	2.7E-06	0.00005	3.3E-06	12005	1484	1.1	1659	37	0.454	0.206	0.0050	0.0026
11	12.1	4.07E-14	0.3855	1.6E-04	0.00062	5.2E-06	0.00006	2.2E-06	0.00008	3.7E-06	0.00008	4.2E-06	4958	531	0.6	1631	42	0.621	0.287	0.0090	0.0047
12	12.5	9.05E-15	0.0857	7.6E-05	0.00013	2.5E-06	0.00002	3.7E-06	0.00005	2.6E-06	0.00001	2.9E-06	11376	163931	0.1	1698	89	1.688	0.792	0.0150	0.0109

Monitors for second series: total gas from multistep runs; up to fusion at 14 A laser; heating times all 5 min.

^{40}Ar M	^{40}Ar (nA)	±2SE Abs	^{39}Ar (nA)	±2SE Abs	^{38}Ar (nA)	±2SE Abs	^{37}Ar(nA)	±2SE Abs	^{36}Ar (nA)	±2SE Abs	Monitor	relative z coordinate (mm)	days after irradiation
5.68E-13	5.3806	6.4E-04	0.75984	1.5E-04	0.13021	8.1E-05	0.01408	2.5E-05	0.00210	1.4E-05	FCs-3_C_Tube2 (8 steps)	0	26.8
5.68E-13	5.3797	5.3E-04	0.59396	1.5E-04	0.10192	5.2E-05	0.01151	2.2E-05	0.00574	1.6E-05	FCs-1_F_Tube2 (6 steps)	14	25.9
6.40E-13	6.0645	8.4E-04	0.01864	2.6E-05	0.02536	4.2E-05	0.02748	2.9E-05	0.00009	8.2E-06	Hb3Gr-1_B_Tube2 (6 steps)	-1	25.7
7.30E-13	6.9126	7.8E-04	0.05127	4.0E-05	0.01535	2.7E-05	0.07607	5.4E-05	0.00011	1.0E-05	MMhb-3_D_Tube2 (9 steps)	13	24.9
7.26E-13	6.8749	9.1E-04	0.05072	4.7E-05	0.01265	2.8E-05	0.07484	5.9E-05	0.00037	1.1E-05	MMhb-1_A_Tube2 (9 steps)	-2	24.7

Exponential fractionation factor: -0.321
All values regressed to time of gas inlet into mass spectrometer.

Blank measurements carried out after 3 or 4 step measurements using exactly same protocol.
Measured signals were blank corrected, using blank time functions, before regression.

Constants used:

Atmospheric argon ratios:		
$(^{40}Ar/^{36}Ar)_A$	298.56 ± 0.31	Lee et al., 2006
$(^{38}Ar/^{36}Ar)_A$	0.1885 ± 0.0003	Lee et al., 2006
Interfering isotope production ratios:		
$(^{39}Ar/^{37}Ar)_{Ca}$	(8.6 ± 0.1)E-4	Own calibrations of position B2W in Safari1 reactor
$(^{36}Ar/^{37}Ar)_{Ca}$	(2.8 ± 1.1)E-4	Own calibrations of position B2W in Safari1 reactor
$(^{40}Ar/^{39}Ar)_K$	0.0426 ± 0.0041	Own calibrations of position B2W in Safari1 reactor
Decay constants:		
^{40}K		
total	(5.541 ± 0.014)E-10 a^{-1}	Kossert and Günther 2004
^{39}Ar	0.00258 ± 0.00003 a^{-1}	Stoenner et al. (1965)
^{37}Ar	0.01975 ± 0.0005 day^{-1}	Renne and Norman (2001)