

**Supplementary Table 4. Radioisotopic dating results.**

Run ID	Power (W)	<sup>40</sup> Ar (moles)	<sup>40</sup> Ar (nA)	± σ (nA)	<sup>39</sup> Ar (nA)	± σ (nA)	<sup>38</sup> Ar (nA)	± σ (nA)	<sup>37</sup> Ar (nA)	± σ (nA)	<sup>36</sup> Ar (nA)	± σ (nA)	<sup>40</sup> Ar*/ <sup>39</sup> Ar <sub>K</sub>	± σ	% <sup>40</sup> Ar*	Age (Ma)	± σ (Ma)
33764-01D	3	1.92E-14	3.13741	0.00491	0.00955	0.00017	0.00199	0.00004	0.03426	0.00024	0.01076	0.00010	-4.7878	4.2913	-1.45	-11.438	10.284
33764-01E	4	1.67E-14	2.72943	0.00431	0.03053	0.00025	0.00213	0.00005	0.09336	0.00084	0.00877	0.00009	4.5916	1.2014	5.12	10.901	2.844
33764-01F	5	6.01E-15	0.98311	0.00192	0.04986	0.00030	0.00124	0.00003	0.16123	0.00148	0.00292	0.00006	2.6133	0.4111	13.22	6.213	0.976
33764-01G	6	3.81E-15	0.62293	0.00162	0.11428	0.00047	0.00182	0.00004	0.36753	0.00359	0.00141	0.00005	2.0504	0.1335	37.53	4.876	0.317
33764-01H	7	3.85E-15	0.62959	0.00091	0.18128	0.00061	0.00247	0.00005	0.53120	0.01098	0.00127	0.00005	1.6341	0.0784	46.95	3.887	0.186
33764-01I	8	3.20E-15	0.52386	0.00142	0.14503	0.00030	0.00229	0.00005	0.47040	0.00659	0.00103	0.00003	1.7741	0.0706	49.01	4.220	0.168
33764-01J	9	3.85E-15	0.63008	0.00172	0.14058	0.00035	0.00217	0.00004	0.47718	0.00640	0.00149	0.00005	1.6031	0.1089	35.68	3.814	0.259
33764-01K	10	1.16E-15	0.19026	0.00087	0.05166	0.00018	0.00082	0.00003	0.18357	0.00144	0.00037	0.00003	1.8271	0.1733	49.48	4.346	0.412
33764-01L	11	1.27E-15	0.21002	0.00071	0.05318	0.00022	0.00079	0.00003	0.20326	0.00146	0.00047	0.00003	1.6202	0.1713	40.91	3.854	0.407
33764-02A	2	5.29E-15	0.84959	0.00203	0.00905	0.00011	0.00070	0.00003	0.04019	0.00046	0.00285	0.00006	0.9580	2.0278	1.02	2.280	4.823
33764-02B	3	6.71E-15	1.06916	0.00253	0.02335	0.00012	0.00091	0.00003	0.09477	0.00078	0.00326	0.00006	4.7857	0.8853	10.42	11.361	2.095
33764-02C	4	5.11E-15	0.81705	0.00188	0.03969	0.00016	0.00104	0.00004	0.15921	0.00088	0.00239	0.00004	3.0742	0.3189	14.89	7.306	0.756
33764-02D	5	2.54E-15	0.40067	0.00160	0.07145	0.00032	0.00119	0.00004	0.28515	0.00119	0.00099	0.00005	1.8431	0.1966	32.77	4.384	0.467
33764-02E	6	2.60E-15	0.41371	0.00161	0.12675	0.00037	0.00179	0.00004	0.49874	0.00165	0.00077	0.00005	1.7686	0.1085	54.02	4.207	0.258
33764-02F	7	2.53E-15	0.40611	0.00153	0.12199	0.00037	0.00185	0.00005	0.49308	0.00165	0.00073	0.00004	1.8892	0.1008	56.59	4.493	0.239
33764-02G	8	2.48E-15	0.40223	0.00211	0.08937	0.00035	0.00124	0.00004	0.35979	0.00119	0.00090	0.00005	1.8264	0.1688	40.46	4.344	0.401
33764-02H	10	4.88E-15	0.77820	0.00181	0.17227	0.00045	0.00278	0.00006	0.72932	0.00281	0.00181	0.00003	1.7431	0.0668	38.47	4.146	0.159
33764-02I	12	1.64E-15	0.26549	0.00188	0.05624	0.00017	0.00084	0.00003	0.33402	0.00094	0.00067	0.00003	1.6451	0.1617	34.70	3.913	0.384
33764-02J	14	4.03E-16	0.06768	0.00134	0.01305	0.00012	0.00024	0.00003	0.09418	0.00064	0.00018	0.00003	1.6235	0.6291	31.14	3.862	1.495
33764-02K	17	3.90E-16	0.06181	0.00134	0.01130	0.00011	0.00019	0.00003	0.12036	0.00079	0.00020	0.00003	0.9773	0.7286	17.73	2.326	1.733
33764-02L	20	2.33E-16	0.03712	0.00129	0.00614	0.00014	0.00012	0.00003	0.08613	0.00060	0.00011	0.00003	1.7126	1.3423	28.02	4.074	3.189

Samples were degassed in two aliquots (Run ID numbers 33764-01 and 33764-02) by incremental heating with a CO<sub>2</sub> laser beam conducted through an integrator lens for homogeneous heating. Each aliquot was approximately 50 mg of sample.  $J = 0.001320 \pm 0.000002$  based on replicate analyses of the 1.194 Ma ACs standard (Nomade et al., 2005). Isotope relative abundances are given in units of amplified ion beam current (nA), corrected for background, mass discrimination, radioactive decay. Discrimination was  $1.0063 \pm 0.0023$  per atomic mass unit, applied as a power law correction. Ages are computed from these data, corrected for interfering nuclear reactions summarized by Renne et al. (2005), using the constants summarized by Steiger and Jäger (1977). Age uncertainties do not include contributions from decay constants or the age of the standard. All uncertainties in this table are given at one standard deviation.