

Table S2. Details on measured AHe thermochronometric ages.

Sample_Aliquot	Longit ude (°)	Latitu de (°)	Elevati on (m)	eU ¹ (ppm)	mass ² (μg)	ser ³ (μm)	U _{total} (mol)	U _{total} 1 (mol)	232Th (mol)	232Th 1 (mol)	147Sm (mol)	147Sm 1 (mol)	4He (mol)	4He 1 (mol)	Uncorr . Age		Ft ⁴	Corr.		Mean age	Mean age 1
															age (Ma)	1 (Ma)		age (Ma)	1 (Ma)		
17PG006a_1	-72.74	-46.47	605	37	1.4	38.6	1.90E-13	1.03E-14	7.98E-14	4.72E-15	1.10E-14	3.69E-16	9.28E-16	2.09E-17	3.5	0.2	0.67	5.1	0.3	n.r.	
17PG006a_2				33	1.1	33.4	1.31E-13	7.50E-15	1.00E-13	4.83E-15	1.38E-14	3.05E-16	1.99E-15	3.63E-17	10.0	0.5	0.63	16.0	0.9		
17PG007a_1	-72.74	-46.46	444	25	2.0	41.5	1.85E-13	1.23E-14	8.34E-14	5.22E-15	1.15E-14	6.46E-16	1.52E-14	2.07E-16	57.8	3.5	0.77	74.8	4.4	n.r.	
17PG007a_2				43	0.6	28.7	9.25E-14	6.35E-15	6.86E-14	4.27E-15	9.48E-15	3.97E-16	4.97E-16	1.51E-17	3.6	0.2	0.57	6.4	0.5		
17PG009a_1	-72.61	-46.8	335	10	4.4	55.5	8.53E-14	4.48E-15	3.92E-13	1.33E-14	5.42E-14	1.05E-15	4.44E-15	6.28E-17	19.7	0.6	0.74	26.3	1.1	8.1	1.7
17PG009a_2				8	2.8	49.3	5.26E-14	3.76E-15	1.69E-13	8.23E-15	2.34E-14	5.35E-16	5.49E-16	1.42E-17	4.7	0.2	0.73	6.4	0.4		
17PG009a_3				8	4.6	54.6	9.04E-14	5.50E-15	3.10E-13	7.75E-15	4.28E-14	1.11E-15	1.55E-15	2.89E-17	7.5	0.3	0.76	9.9	0.4		
17PG009a_4				8	4.6	57.3	9.68E-14	5.04E-15	2.37E-13	8.53E-15	3.28E-14	8.42E-16	3.16E-15	4.56E-17	16.3	0.6	0.77	21.0	0.8		
17PG010a_1	-72.36	-46.63	437	18	20.9	91.1	9.64E-13	2.71E-14	2.74E-12	7.03E-14	3.80E-13	4.63E-15	6.85E-15	9.69E-17	3.3	0.1	0.86	3.9	0.1	3.2	0.4
17PG010a_2				20	5.9	56.8	2.76E-13	1.19E-14	9.63E-13	2.69E-14	1.33E-13	2.02E-15	1.52E-15	3.15E-17	2.4	0.1	0.77	3.1	0.1		
17PG010a_3				19	5.5	58.3	2.30E-13	8.03E-15	8.43E-13	2.25E-14	1.17E-13	1.87E-15	1.26E-15	2.69E-17	2.3	0.1	0.76	3.0	0.1		
17PG010a_4				26	5.1	55.9	2.71E-13	1.15E-14	1.17E-12	2.99E-14	1.61E-13	2.57E-15	1.54E-15	3.00E-17	2.2	0.1	0.76	2.9	0.1		
17PG015a_1	-72.93	-46.54	231	44	6.4	64.0	7.86E-13	2.43E-14	1.63E-12	4.59E-14	2.26E-13	3.14E-15	5.26E-15	7.47E-17	3.5	0.1	0.79	4.5	0.1	4.2	0.3
17PG015a_2				47	7.4	67.3	9.96E-13	2.88E-14	1.89E-12	4.26E-14	2.62E-13	3.48E-15	6.23E-15	8.10E-17	3.4	0.1	0.80	4.2	0.1		
17PG015a_3				46	5.8	55.4	7.15E-13	2.08E-14	1.69E-12	5.45E-14	2.34E-13	3.40E-15	4.69E-15	6.67E-17	3.3	0.1	0.76	4.3	0.1		
17PG015a_4				50	3.8	51.4	5.06E-13	1.79E-14	1.21E-12	3.34E-14	1.67E-13	2.01E-15	2.80E-15	4.07E-17	2.8	0.1	0.74	3.7	0.1		
17PG016a_1	-72.98	-46.52	190	62	3.1	45.6	5.27E-13	2.53E-14	1.21E-12	2.74E-14	1.67E-13	2.80E-15	3.00E-15	3.67E-17	2.9	0.1	0.72	4.1	0.1	4.1	0.3
17PG016a_2				70	2.4	42.5	4.56E-13	1.31E-14	1.05E-12	3.30E-14	1.46E-13	3.52E-15	2.66E-15	3.62E-17	3.0	0.1	0.70	4.3	0.1		
17PG016a_3				29	3.0	49.7	3.17E-13	1.57E-14	1.89E-13	9.21E-15	2.62E-14	1.02E-15	1.21E-15	1.95E-17	2.6	0.1	0.75	3.5	0.2		
17PG016a_4				24	3.4	53.1	2.78E-13	1.29E-14	2.59E-13	1.18E-14	3.58E-14	8.88E-16	1.45E-15	2.99E-17	3.4	0.1	0.76	4.4	0.2		
17PG017a_1	-73.05	-46.52	133	16	2.9	47.5	9.41E-14	8.82E-15	3.94E-13	2.98E-14	5.45E-14	9.92E-16	1.74E-15	3.77E-17	7.3	0.5	0.72	10.2	0.6	n.r.	
17PG017a_2				14	1.3	35.6	3.81E-14	3.17E-15	1.41E-13	6.29E-15	1.95E-14	5.15E-16	1.04E-15	2.03E-17	11.5	0.6	0.63	18.4	1.0		
17PG017a_3				18	1.4	35.4	4.78E-14	3.40E-15	2.19E-13	6.29E-15	3.04E-14	5.84E-16	7.13E-16	2.19E-17	5.6	0.3	0.63	9.0	0.4		
17PG017a_4				81	1.7	41.9	4.19E-13	1.38E-14	7.10E-13	1.90E-14	9.82E-14	1.53E-15	2.04E-15	3.46E-17	2.7	0.1	0.69	3.9	0.1		
17PG019a_1	-73.15	-46.5	155	24	1.7	39.7	7.24E-14	5.50E-15	4.18E-13	1.52E-14	5.78E-14	1.20E-15	8.88E-16	1.96E-17	4.1	0.2	0.66	6.2	0.3	6.1	2.4
17PG019a_2				17	2.5	42.4	8.92E-14	7.03E-15	3.71E-13	9.64E-15	5.13E-14	1.05E-15	1.41E-15	2.53E-17	6.3	0.3	0.70	9.0	0.4		
17PG019a_4				8	1.8	43.0	1.91E-14	2.96E-15	1.84E-13	8.15E-15	2.55E-14	3.94E-15	1.67E-16	8.03E-18	2.1	0.2	0.68	3.1	0.2		
17PG020a_1	-73.21	-46.47	60	22	2.6	46.1	1.68E-13	9.55E-15	3.14E-13	1.15E-14	4.34E-14	1.83E-15	7.46E-16	1.60E-17	2.4	0.1	0.72	3.4	0.2	3.7	0.8
17PG020a_2				37	2.4	44.4	2.67E-13	1.59E-14	4.53E-13	1.02E-14	6.27E-14	2.25E-15	1.14E-15	2.13E-17	2.4	0.1	0.71	3.4	0.2		
17PG020a_3				51	2.7	46.2	4.66E-13	2.31E-14	5.20E-13	1.63E-14	7.19E-14	2.88E-15	2.73E-15	4.48E-17	3.6	0.1	0.72	5.0	0.2		
17PG020a_4				16	4.3	53.1	1.87E-13	8.44E-15	4.40E-13	1.32E-14	6.08E-14	2.28E-15	9.21E-16	2.09E-17	2.5	0.1	0.81	3.1	0.1		

1: Effective uranium;
eU=[U]+0.235[Th]; eU calculated using
the mass determined geometrically
with 3D-He (Glotzbach et al., 2019)

2: Mass determined with 3D-He
(assumed density of 3.2 g/cm3)

3: Sphere-equivalent radius;
determined with 3D-He

4: Ft correction factor
determined with 3D-He

5: n.r.=single -grain
ages not replicating

Red: error >25%

*single-grain age rejected based on
AFT age (~15.9 Ma)