

Table S7. Details on measured ZFT thermochronometric ages.

Sample ID	VG11-LL-10
pd (tracks/cm2)	5.4074E+05
Relative error (%)	1.16
U content fucose monitor (ppm)	50
Zeta (yr cm2)	121
Zeta SE	5
Counter square size (cm2)	1.0E-06

Grain #	Ns	Ni	ps (cm-2)	pi (cm-2)	squares	U (ppm)
1	11	61	1.83E+05	1.02E+06	60	94
2	12	54	2.00E+05	9.00E+05	60	83
3	7	42	2.33E+05	1.40E+06	30	129
4	11	89	1.57E+05	1.27E+06	70	118
5	9	68	1.29E+05	9.71E+05	70	90
6	7	65	1.75E+05	1.63E+06	40	150
7	20	123	2.22E+05	1.37E+06	90	126
8	16	90	2.39E+05	1.34E+06	67	124
9	8	82	2.05E+05	2.10E+06	39	194
10	12	74	2.40E+05	1.48E+06	50	137
11	29	99	1.81E+06	6.19E+06	16	572
12	19	112	3.39E+05	2.00E+06	56	185
13	5	57	1.25E+05	1.43E+06	40	132
14	3	39	1.00E+05	1.30E+06	30	120
15	2	6	3.33E+05	1.00E+06	6	92
16	3	15	1.88E+05	9.38E+05	16	87
17	1	12	1.11E+05	1.33E+06	9	123
18	12	73	1.33E+05	8.11E+05	90	75
19	15	58	2.14E+05	8.29E+05	70	77
20	11	62	2.75E+05	1.55E+06	40	143
21	11	53	2.75E+05	1.33E+06	40	123
22	4	8	3.33E+05	6.67E+05	12	62
23	7	49	1.75E+05	1.23E+06	40	113
24	3	14	1.88E+05	8.75E+05	16	81
25	9	41	1.84E+05	8.37E+05	49	77
26	4	35	2.00E+05	1.75E+06	20	162
27	15	34	1.00E+06	2.27E+06	15	210
28	8	17	3.81E+05	8.10E+05	21	75

Sample ID VG12-CM-03
pd (tracks/cm2) 5.4152E+05
Relative error (%) 1.16
U content fucose monitor (ppm) 50
Zeta (yr cm2) 121
Zeta SE 5
Counter square size (cm2) 1.0E-06

Grain #	Ns	Ni	ps (cm-2)	pi (cm-2)	squares	U (ppm)
1	41	128	5.13E+06	1.60E+07	8	1477
2	73	230	3.65E+06	1.15E+07	20	1062
3	21	58	2.33E+06	6.44E+06	9	595
4	17	37	2.13E+06	4.63E+06	8	427
5	52	113	2.60E+06	5.65E+06	20	522
6	38	63	4.22E+06	7.00E+06	9	646
7	57	161	2.85E+06	8.05E+06	20	743
8	24	32	6.00E+06	8.00E+06	4	739
9	57	92	1.90E+06	3.07E+06	30	283
10	49	146	2.45E+06	7.30E+06	20	674
11	40	79	2.00E+06	3.95E+06	20	365
12	38	104	1.90E+06	5.20E+06	20	480
13	31	110	2.58E+06	9.17E+06	12	846
14	138	284	6.90E+06	1.42E+07	20	1311
15	106	428	3.53E+06	1.43E+07	30	1317
16	73	179	1.83E+06	4.48E+06	40	413
17	51	161	1.82E+06	5.75E+06	28	531
18	101	294	3.61E+06	1.05E+07	28	970
19	41	79	3.42E+06	6.58E+06	12	608
20	59	78	2.95E+06	3.90E+06	20	360
21	54	125	2.25E+06	5.21E+06	24	481
22	113	267	3.77E+06	8.90E+06	30	822
23	123	313	4.10E+06	1.04E+07	30	963
24	109	249	4.54E+06	1.04E+07	24	958
25	51	105	2.55E+06	5.25E+06	20	485