Data repository item 2003153

ANALYTICAL PROCEDURE

Samples of 5 to 10kg were collected and zircons and apatites were extracted using common procedures for heavy mineral separation. These include crushing, sieving, magnetic- and heavy-liquid separation and eventually hand picking. Mineral concentrates were mounted in epoxy resin (apatite) and PFA Teflon (zircon). After polishing revelation of fossil tracks in apatite was achieved by etching in 6.5% HNO3(aq) at 20°C for 40 seconds. Zircons were etched in a eutectic mixture of NaOH/KOH at 210°C for 5 to 25 hours. For revelation of induced tracks the detector muscovites were etched in 40% HF(aq) at 20°C for 45 minutes. Thermal neutron irradiation was carried out at the High Flux Australian Reactor with the neutron fluxes monitored using CN5 (apatite) and SRM612 (zircon) dosimeter glasses.
Counting of fission tracks was carried out on a computer controlled Zeiss microscope, equipped with a Kinetec stage, and at magnifications of x1000 (apatite and dosimetry) and x1600 (zircon), respectively. Only grains with their prism planes parallel to the polished surface were used for age dating and track length measurements. Furthermore, the determination of track length distributions in apatite only used confined horizontal tracks. All samples have been analyzed using the external detector method (Gleadow, 1981). Ages were calculated using the zeta calibration method (Hurford and Green, 1983) with a zeta-value of 357±15 (apatite, CN5) and 348±8 (zircon, SRM612). The ages given in Fig. 2 are central ages (Galbraith and Laslett, 1993); errors are quoted as 1σ in table 1.

TABLE DR1. APATITE AND ZIRCON FISSION-TRACK DATA

Sample	Mineral (no. of crystals)	Latitude, longitude (°)	Altitude (m)	ρ_S, ×10^6 (n_S)	ρ_I, ×10^6 (n_I)	ρ_D, ×10^6 (n_D)	$P(\chi^2)$ %	FT age (Ma) ± 1σ	Track lengths (μm ± 1σ)	Std. dev. (no. of tracks)
WA 01	a (16)	45°36'35.4", 6°43'35.4"	1650	0.098 (38)	3.839 (1491)	1.305 (2291)	99	5.9 ± 1.0	12.93 ± 0.35	1.63 (22)
	z (15)			3.298 (937)	4.612 (1310)	0.138 (2282)	55	17.2 ± 0.8		
WA 02	**A (16)**	45°36'47.5", 6°44'29.5"	1320	0.080 (32)	3.913 (1558)	1.188 (1879)	98	4.3 ± 0.8		
	z (20)			5.424 (1494)	6.549 (1804)	0.134 (2240)	95	19.3 ± 0.8		
WA 2	**Z (9)**	45°17'33.0", 6°28'18.8"	2420	23.38 (1276)	6.742 (368)	0.152 (1097)	<5	89 ± 8		
WA 3	**A (7)**	45°15'41.2", 6°24'56.2"	1030	0.197 (86)	9.270 (4049)	1.233 (1922)	72	4.7 ± 0.5	12.83 ± 0.29	1.30 (20)
	Z (8)			16.71 (1111)	6.68 (444)	0.151 (1097)	20	65 ± 4		
WA 5	**Z (4)**	45°21'35.4", 6°28'41.5"	2080	17.13 (382)	6.32 (141)	0.150 (1097)	72	70 ± 7		
WA 6	**Z (11)**	45°21'14.6", 6°29'16.7"	2150	16.61 (2165)	4.627 (603)	0.149 (1097)	11	92 ± 6		
WA 7	**Z (5)**	45°22'36.7", 6°29'59.7"	1330	9.081 (740)	2.405 (196)	0.148 (1094)	<5	80 ± 18		
WA 8	**A (6)**	45°12'46.5", 6°25'27.4"	1670	0.463 (128)	9.023 (2466)	1.234 (1922)	62	11.4 ± 1.1	13.2 ± 0.41	1.86 (21)
	Z (13)			16.72 (2713)	5.221 (847)	0.147 (1097)	<5	78 ± 11		
WA 9	**A (14)**	45°13'28.4", 6°25'25.9"	1417	0.153 (99)	3.683 (2381)	1.235 (1922)	73	9.2 ± 1.0	12.81 ± 0.37	1.32 (13)
	Z (20)			5.249 (1822)	5.900 (2048)	0.146 (1097)	75	23 ± 1		
WA 10	**A (10)**	45°13'36.3", 6°24'47.0"	1350	0.174 (102)	7.220 (4235)	1.235 (1922)	83	5.3 ± 0.5	12.94 ± 0.22	1.49 (46)
	Z (12)			13.39 (1760)	4.648 (611)	0.145 (1097)	<5	70 ± 7		
WA 11	**Z (12)**	45°14'21.0", 6°24'59.0"	1080	5.208 (1099)	2.417 (510)	0.144 (1094)	<5	54 ± 4		
WA 13	**Z (18)**	45°39'44.7", 6°46'23.6"	1370	4.759 (1522)	8.151 (2607)	0.144 (1097)	78	14.6 ± 0.6		
WA 15	**A (16)**	45°29'58.4", 6°32'26.9"	940	0.042 (42)	1.876 (1896)	1.237 (1922)	97	4.9 ± 0.8	11.81 ± 0.56	1.76 (10)
	Z (7)			5.032 (236)	7.506 (352)	0.142 (1097)	36	16.6 ± 1.6		
WA 16	**Z (4)**	45°30'15.4", 6°32'32.8"	990	2.323 (200)	3.310 (285)	0.132 (1094)	86	16.1 ± 1.6		
WA 17	**A (8)**	45°30'29.5", 6°32'36.2"	1200	0.058 (28)	5.909 (2876)	1.238 (1922)	64	2.2 ± 0.4	12.28 ± 0.37	1.48 (16)
	Z (19)			3.475 (1026)	5.836 (1723)	0.141 (1097)	89	14.6 ± 0.7		
WA 18	**A (10)**	45°29'37.8", 6°32'13.8"	790	0.086 (45)	7.709 (4036)	1.239 (1922)	93	2.5 ± 0.4	12.93 ± 0.25	1.12 (20)
	Z (20)			4.774 (2072)	7.712 (3347)	0.140 (1097)	20	15.0 ± 0.6		
WA 19	**A (11)**	45°36'06.1", 6°47'01.5"	1220	0.169 (113)	3.145 (2100)	1.241 (1922)	67	11.9 ± 1.2	12.59 ± 0.35	1.87 (28)
	Z (14)			4.739 (1319)	6.083 (1693)	0.139 (1097)	93	18.8 ± 0.9		
WA 20	**A (5)**	45°35'55.7", 6°48'01.2"	1734	0.237 (71)	3.923 (1175)	1.242 (1922)	78	13.4 ± 1.7	12.42 ± 0.23	1.61 (48)
	Z (12)			7.361 (1610)	7.329 (1603)	0.136 (1097)	<5	23 ± 1		
WA 21	**A (20)**	45°35'54.5", 6°47'41.7"	1590	0.152 (183)	3.133 (3773)	1.243 (1922)	99	10.8 ± 0.8	12.37 ± 0.28	1.68 (37)
	Z (13)			5.439 (1357)	5.439 (1357)	0.135 (1097)	29	23 ± 1		
WA 22	**A (14)**	45°36'18.7", 6°46'24.2"	920	0.318 (298)	5.525 (5171)	1.243 (1922)	62	12.7 ± 0.8	12.38 ± 0.50	2.20 (19)
WA 23	**Z (10)**	45°41'59.0", 6°52'28.2"	2040	12.25 (976)	16.69 (1329)	0.132 (1097)	72	16.9 ± 0.9		
WA 24	**Z (12)**	45°42'03.8",, 6°52'11.9"	2260	8.639 (1252)	13.07 (1894)	0.131 (1097)	32	15.1 ± 0.7		
WA 30	a (14)	45°11'37.5", 6°27'03.2"	1480	0.289 (133)	3.120 (1434)	1.028 (3089)	99	17.0 ± 1.6	12.76 ± 0.36	1.79 (24)
	z (20)			13.61 (1350)	4.375 (434)	0.137 (2282)	99	74 ± 4		
WA 31	**A (22)**	45°12'07.5", 6°27'50.9"	1200	0.366 (283)	5.920 (4581)	1.653 (2291)	25	18.4 ± 1.3	12.25 ± 0.28	2.01 (51)
	z (13)			13.52 (3725)	3.587 (988)	0.133 (2240)	<5	90 ± 21		
WA 32	**A (20)**	45°12'47.8", 6°28'24.1"	720	0.248 (162)	4.553 (2980)	1.631 (2291)	99	15.8 ± 1.3	12.69 ± 0.37	1.94 (27)
	z (12)			15.84 (1135)	3.696 (271)	0.136 (2282)	23	98 ± 8		
WA 33	a (20)	45°16'18.7", 6°23'03.7"	855	0.111 (100)	6.827 (6149)	1.237 (1879)	99	3.6 ± 0.4	13.16 ± 0.27	1.72 (42)
	z (14)			6.271 (2276)	6.996 (2539)	0.131 (2240)	<5	20 ± 1		
WA 35	**A (20)**	45°18'16.5", 6°20'47.1"	510	0.042 (49)	3.039 (3577)	1.610 (2291)	100	3.9 ± 0.6	14.02 ± 0.24	1.38 (33)
	z (13)			4.554 (985)	8.877 (1920)	0.130 (2240)	<5	10.6 ± 0.8		
WA 36	a (11)	45°18'55.1", 6°19'42.3"	500	0.037 (47)	1.992 (2547)	1.106 (1879)	99	3.6 ± 0.5	14.00 ± 0.27	1.44 (28)
	z (20)			1.502 (934)	2.737 (1702)	0.134 (2282)	12	12.7 ± 0.7		
WA 43	**A (10)**	45°40'59.3", 6°53'48.4"	2380	0.086 (50)	3.088 (1792)	1.588 (2291)	57	7.9 ± 1.1		
	z (10)			1.522 (797)	1.567 (821)	0.136 (2282)	95	23 ± 1		
WA 49	z (20)	45°26'45.1", 6°38'17.6"	930	5.842 (468)	6.454 (517)	0.130 (2240)	84	20.4 ± 1.4		
WA 50	**A (11)**	45°26'59.8", 6°36'40.6"	984	0.116 (65)	3.599 (2021)	1.566 (2291)	31	9.0 ± 1.1		
	z (20)			5.376 (636)	4.404 (521)	0.131 (2282)	99	28 ± 2		
WA 51	a (11)	45°27'47.6", 6°34'39.8"	1040	0.136 (58)	3.482 (1486)	1.021 (3089)	85	7.1 ± 1.0	13.73 ± 0.36	1.26 (12)
	z (15)			10.50 (1469)	4.525 (633)	0.129 (2282)	<5	50 ± 6		
WA 53	a (17)	45°31'43.0", 6°29'12.8"	740	0.043 (28)	3.372 (2178)	1.544 (2291)	86	3.5 ± 0.7		
	z (20)			1.776 (684)	4.386 (1689)	0.128 (2282)	38	8.9 ± 0.5		
WA 54	a (17)	45°31'37.3", 6°29'25.7"	560	0.097 (56)	6.041 (3483)	1.073 (1879)	93	3.1 ± 0.4	12.99 ± 0.52	1.37 (7)
	z (20)			1.478 (489)	4.291 (1420)	0.127 (2240)	97	7.6 ± 0.4		
WA 62	a (20)	45°45'51.6", 6°48'57.9"	2620	0.263 (208)	12.57 (9964)	1.523 (2291)	99	5.7 ± 0.4	12.99 ± 0.25	1.80 (52)
WA 64	z (14)	45°45'45"6", 6°49'18.8"	2560	1.727 (298)	2.452 (423)	0.127 (2282)	46	15.5 ± 1.2		
WA 67	a (7)	45°40'21.5", 6°53'03.6"	2285	0.086 (52)	2.229 (1348)	1.501 (2291)	99	10.3 ± 1.5		
	z (13)			4.988 (670)	5.553 (746)	0.126 (2282)	31	19.6 ± 1.2		
WA 84	z (13)	45°43'29.1", 6°45'53.1"	1800	2.642 (503)	5.604 (1067)	0.126 (2240)	78	10.3 ± 0.6		
WA 90	z (20)	45°40'15.2", 6°41'34.6"	2170	2.714 (1224)	6.494 (2929)	0.125 (2240)	77	9.1 ± 0.4		
WA 92	z (20)	45°40'42.6", 6°42'03.6"	2020	3.192 (1316)	5.725 (2360)	0.114 (2240)	29	12.1 ± 0.5		
WA 93	z (20)	45°41'07.9", 6°42'11.2"	2000	2.629 (839)	5.508 (1758)	0.123 (2240)	52	10.2 ± 0.5		
WA 94	z (12)	45°40'26.6", 6°52'50.2"	2150	2.499 (559)	3.527 (789)	0.124 (2282)	<5	14.4 ± 1.2		
WA 99	z (20)	45°30'49.0", 6°35'27.0"	1200	2.903 (644)	4.463 (990)	0.123 (2240)	39	13.8 ± 0.8		

WA 101	**A (10)**	45°30’14.2”, 6°34’31.3”	715	0.064 (33)	5.958 (3086)	1.479 (2291)	88	2.8 ± 0.5		
	z (20)			1.698 (903)	2.492 (1325)	0.123 (2282)	98	14.6 ± 0.7		
WA 102	a (30)	45°18’20.1”, 6°19’25.1”	1390	0.101 (67)	5.934 (3936)	1.089 (1879)	100	3.3 ± 0.4	12.93 ± 0.35	1.63 (22)
	z (18)			3.128 (451)	6.422 (926)	0.122 (2282)	9	10.3 ± 0.8		
WA 103	a (20)	45°17’52.8”, 6°19’44.3”	1465	0.136 (129)	7.748 (7326)	1.457 (2291)	99	4.6 ± 0.4	13.40 ± 0.21	1.53 (54)
	z (10)			3.594 (299)	5.061 (421)	0.121 (2240)	71	14.9 ± 1.2		
WA 110	**A (20)**	45°27’34.8”, 6°30’50.7”	800	0.077 (91)	2.900 (3420)	1.436 (2292)	80	6.8 ± 0.7	12.95 ± 0.35	1.62 (22)
	z (20)			2.106 (811)	3.633 (1399)	0.120 (2240)	80	12.1 ± 0.6		
WA 114	a (20)	45°40’51.3”, 6°54’09.0”	2640	0.187 (207)	4.071 (4505)	1.018 (3089)	88	8.3 ± 0.6	13.30 ± 0.42	1.79 (18)
	z (20)			3.898 (1566)	3.895 (1565)	0.121 (2282)	19	21 ± 1		
WA 130	**A (20)**	45°21’00.4”, 6°24’44.3”	2350	0.166 (129)	4.553 (3540)	1.371 (2291)	99	8.9 ± 0.8	13.33 ± 0.38	1.42 (14)
	z (20)			6.159 (1241)	3.896 (785)	0.119 (2282)	40	32 ± 2		
WA 138	z (20)	45°36’16.2”, 6°38’19.2”	1780	2.465 (717)	4.442 (1292)	0.118 (2282)	86	11.3 ± 0.6		
WA 140	**A (1)**	45°42’00.3”, 6°51’32.3”	2550	0.009 (1)	1.115 (120)	1.327 (2291)	100	2.0 ± 2.0		
	z (10)			7.024 (593)	9.322 (787)	0.115 (2240)	88	15.1 ± 0.9		

Second column: A (apatite), Z (zircon), bold capital letters refer to samples from Fügenschuh et al. (1999). Numbers in parenthesis give number of individual grains dated using the external detector method with muscovite detectors. RhoD, RhoS, and RhoI are dosimeter, spontaneous and induced track densities respectively. Numbers in parentheses give numbers of tracks counted. P(χ^2), probability (Galbraith, 1981; Green, 1981). Ages are quoted as central ages (Galbraith and Laslett, 1993) and have been calculated using the zeta calibration method (Hurford and Green, 1983) with zeta values of 348 ± 9 (SRM 612 and FCT zircon) and 357 ± 15 (CN 5 and Durango apatite).