DR2004021

Online Appendix: analytical techniques

$^{40}Ar/^{39}Ar$ Age determinations

$^{40}Ar/^{39}Ar$ Age data for the Vindtop Fm Step heating experiments were performed on approximately 100 mg of fast-neutron irradiated plagioclase phenocrysts using a Heine double vacuum furnace and a small-volume extraction line attached to a MAP 215-50 mass spectrometer. Sample ages were calculated relative to the biotite monitor mineral FCT-3, with an assigned age of 28.03 ± 0.18, calibrated against Mmhb-1 hornblende at 523.5 Ma (Renne et al., 1994).

Isotopes analyses: sample materials, digestion and chemical separation

Sr-Nd-Pb isotopic analyses were performed on the same sample aliquot. Approximately 0.15 g of hand-picked rock chips (0.5-2.0 mm) were leached in 6 M HCl for one hour on a hotplate (150 deg C) and subsequently rinsed repeatedly in MQ water. The leached chips were then digested using HF-HNO_3 digestion techniques. Pb was separated from the dissolved sample by standard anion exchange techniques. The elutant from Pb chemistry was evaporated and, after driving off excess Br by attack with concentrated nitric acid, subjected to conventional cation exchange chemistry where Sr (2 M HCl) and the REE (6 M HCl) were collected after elution of the sample matrix, Rb and Ba. Sr was further purified by use of Eichrom Sr-spec resin on mini-columns. All digestions and chemical separations were performed in a class 100 clean laboratory using distilled acids and ultra-clean MQ water. Total procedural blanks were < 200 pg, < 400 pg and < 60 pg of Sr, Nd and Pb, respectively. These blanks are insignificant compared to the amounts of Sr, Nd and Pb processed in this study.

Mass Spectrometry

All isotopic analyses were carried out on a VG AXIOM multiple-collector inductively coupled plasma mass spectrometer (MC-ICPMS) at the Danish Lithosphere Centre (DLC; Copenhagen). Sr isotope ratios were determined using a Micromist nebuliser, whereas Nd and Pb were determined using a Cetac Aridus desolvating nebuliser. Sr isotopic procedures followed those described in Waight et al. (2002) and Waight et al. (submitted). Nd isotopic analyses were determined on bulk REE cuts, using methods similar to those described by Luais et al. (1997). Pb isotopic analyses were determined using a ^{207}Pb-^{204}Pb double spike, following a modified procedure of that described by Thirlwall (2002).

Standard data

Sr isotopic data are reported relative to a value of 0.710250 for the SRM987 standard. This standard has yielded a mean and external reproducibility of 0.710255 ± 20 (2 sd; n = 100). Nd isotopic data were measured interspersed with an in-house Nd standard prepared from high purity AMES metal. This yielded a mean $^{143}Nd/^{144}Nd$ of 0.51213 ± 1 (2 sd).This standard has been cross-calibrated against La Jolla and is equivalent to 0.512855 for this international standard. The mean values obtained for the SRM981 Pb standard using the double spike method in the DLC MC-ICPMS laboratory are: $^{206}Pb/^{204}Pb$ = 16.9416 ± 13; $^{207}Pb/^{204}Pb$ = 15.4994 ± 13; $^{208}Pb/^{204}Pb$ = 36.7237 ± 35 (2 sd; n = 85).These Pb isotope ratios are identical to those obtained by Thirlwall (2002) on SRM981 using similar double spike techniques.

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Table DR1 40Ar/39Ar age data for the Vindtop Formation.

Step	Temp. °C	Age (Ma)	1s	$\%^{40}Ar_R$	% total ^{39}Ar
436144 - plagioclase; J = 0.0016391 ± 0.000014746					
1	800	13.6	0.4	55.3	21.7
2	950	13.3	0.4	60.5	28.2
3	1100	13.4	0.4	84.2	26.7
4	1250	18.0	0.6	84.7	15.4
5	1400	25.1	0.6	69.1	7.9

Plateau age (steps 1 - 3; 76.6% ^{39}Ar released) = 13.4 ± 0.2 Ma
Inverse isochron (steps 1 -3) = 13.6 ± 0.3 Ma; $^{40}Ar/^{36}Ar_i$ = 294.4 ± 8.9

Step	Temp. °C	Age (Ma)	1s	$\%^{40}Ar_R$	% total ^{39}Ar
436153 - plagioclase; J = 0.0016786 ± 0.000013338					
1	800	16.3	0.6	73.2	27.0
2	1000	14.0	0.4	90.9	38.3
3	1150	14.7	0.9	72.8	16.6
4	1300	21.3	1.0	70.5	10.3
5	1400	20.9	1.7	54.0	7.7

Plateau age (steps 2 - 3; 54.9% ^{39}Ar released) = 14.2 ± 0.4 Ma
Inverse isochron (steps 1 -3) = 13.6 ± 0.5 Ma; $^{40}Ar/^{36}Ar_i$ = 425.7 ± 56.8.

Table DR2. Major (wt-%) and trace element (ppm) analyses of Miocene lavas and dikes from East Greenland.

Sample ID	Type [1]	Localities with flow number [2]	SiO2	TiO2	Al2O3	Fe2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	Vol.	Sum	CaO/ Al2O3
436156 [5]	Lava	Nunatak-25	46.86	2.00	15.78	2.39	8.29	0.17	8.99	10.52	2.82	0.73	0.42	0.75	99.72	0.67
436155 [5]	Lava	Nunatak-24	47.01	2.02	16.06	2.40	7.90	0.17	8.91	10.49	2.87	0.75	0.43	0.59	99.59	0.65
436154 [5]	Lava	Nunatak-23	46.60	1.98	15.98	4.08	6.68	0.17	8.93	10.51	2.57	0.69	0.41	1.12	99.71	0.66
436153 [5]	Lava	Nunatak-22	47.86	2.50	16.77	8.58	3.13	0.18	4.93	8.64	3.47	1.36	0.79	1.25	99.45	0.52
436151 [5]	Lava	Nunatak-21	46.57	2.20	16.86	3.09	7.10	0.17	7.40	11.58	2.58	0.91	0.46	0.96	99.88	0.69
436141 [5]	Lava	Vindtop-14	47.08	2.87	16.36	4.33	8.37	0.19	5.56	7.89	3.72	1.23	0.79	1.10	99.50	0.48
436143 [5]	Lava	Vindtop-13	45.50	2.52	16.84	2.96	9.14	0.18	6.80	8.86	3.41	0.64	0.43	2.52	99.79	0.53
436145 [4]	Lava	Vindtop-12	46.23	2.11	15.47	6.47	4.78	0.17	8.94	9.29	3.11	0.94	0.47	2.22	100.20	0.60
436146 [4]	Lava	Vindtop-11	47.45	2.01	15.15	2.50	7.92	0.18	8.57	9.08	3.10	1.01	0.49	2.08	99.53	0.60
436147 [4]	C. Lava [1	Vindtop-10	49.60	1.68	15.07	4.76	4.74	0.15	9.16	7.86	3.04	1.02	0.39	2.66	100.13	0.52
436148 [4]	C. Lava [1	Vindtop-09	52.48	1.41	15.05	3.36	5.37	0.13	7.87	7.99	3.28	1.29	0.31	1.11	99.64	0.53
436149 [4]	Lava	Vindtop-08	48.04	2.32	16.93	3.63	6.07	0.15	6.00	9.10	3.32	1.21	0.75	2.21	99.73	0.54
436188 [4]	Lava	Vindtop-07	48.12	2.35	16.94	2.65	7.16	0.16	6.01	9.28	3.72	1.25	0.83	1.60	100.07	0.55
436189 [4]	Lava	Vindtop-06	47.43	2.04	16.58	3.81	5.76	0.15	7.57	9.70	2.84	1.03	0.66	2.20	99.76	0.59
436190 [4]	Lava	Vindtop-05	47.12	2.07	16.39	3.41	6.19	0.16	7.25	10.11	2.83	1.18	0.75	2.43	99.88	0.62
436191 [4]	Lava	Vindtop-04	46.74	2.02	16.22	3.28	6.39	0.16	7.57	10.55	2.76	1.16	0.81	2.12	99.76	0.65
436192 [4]	Lava	Vindtop-03	46.90	2.07	15.94	3.73	6.01	0.16	7.71	10.07	2.89	1.11	0.80	2.47	99.86	0.63
436193 [4]	Lava	Vindtop-02	47.02	1.87	16.01	3.53	6.33	0.16	7.75	10.45	2.88	0.93	0.68	2.21	99.82	0.65
436186 [4]	Lava	Vindtop-01	47.16	2.01	16.48	2.03	7.50	0.16	7.46	10.20	3.40	1.33	0.80	1.65	100.18	0.62
436150 [4]	Dike	Dike in Vindtop-08	44.26	2.54	16.92	3.66	5.48	0.20	4.99	11.35	2.64	1.62	0.71	4.68	99.05	0.67
436187 [4]	Dike	Dike in Vindtop-08	48.07	2.33	17.08	4.72	5.15	0.15	6.16	9.30	3.60	0.83	0.74	1.83	99.95	0.54
404243 [5]	Dike	Dike from Borggraven	45.62	1.99	16.82	3.42	7.40	0.18	6.17	10.62	2.73	0.79	0.37	3.28	99.39	0.63
436152 [5]	Dike	Dike in Nunatak-22	46.71	1.75	15.96	2.14	8.68	0.17	9.50	10.33	2.61	0.36	0.29	1.33	99.83	0.65
BHVO-1 [3,4]		GEUS	49.95	2.77	13.76	12.19	-	0.17	7.32	11.33	2.40	0.54	0.28	0.46	100.19	
% std.err.(1s)																
BHVO-1 [5]		Oregon/DLC														
% std.err.(1s)																

[1] C. Lava refers to two clearly crustally contaminated lavas (i.e. high SiO2 and low 206Pb/204Pb)

[2] Vindtop series samples from Loc. 1 in Fig.1. Nunatak series samples from Loc. 2 in Fig. 1.

[3] USGS reference material BHVO-1 analysed by XRF for major elements on fused glass discs by J. Kystol, GEUS rock analyses lab.

[4] ICPMS analyses at GEUS rock geochemical lab. Performed on acid digested samples. Calibrated to synthetic REE sols., BHVO-1 and GH.

[5] ICPMS analyses at OSU, Oregon by C.Tegner, A. Ungerer on acid digested samples. Calibrated by O. Stecher using re-compiled values of BIR-1, BHVO-1, W-2, BR and BE-N. Listed BHVO-1 values and % standard errors are from 16 separate determinations.

N.B. There is no systematic bias between the sets of data for the two laboratories at the 2 sigma level (with the exception of Th).

The problem relating to reproducibility of Th is probably related to the known difficulty of keeping Th in solution.

Table DR2. (continued) Major (wt-%) and trace element (ppm) analyses of Miocene lavas and dikes from East Greenland.

Sample ID	Sc	V	Cr	Co	Ni	Cu	Zn	Rb	Sr	Y	Zr	Nb	Ba	La	Ce	Pr
436156 [5]	30.0	198.3	364.7	57.8	157.7	46.4	73.6	14.2	694.4	32.1	154.0	42.2	457.7	34.3	70.3	8.1
436155 [5]	42.8	198.8	353.7	56.2	149.6	44.0	71.3	14.5	598.6	32.0	152.1	40.4	447.0	34.5	70.5	8.1
436154 [5]	33.8	199.9	321.8	54.3	145.0	44.9	72.4	15.4	550.0	31.2	138.5	34.2	413.3	32.2	67.1	7.7
436153 [5]	23.7	177.9	32.4	29.0	32.9	32.6	89.1	23.8	620.4	41.4	217.7	56.7	748.3	55.4	112.4	12.9
436151 [5]	31.7	234.1	65.1	50.3	58.8	41.3	75.5	16.2	681.0	27.4	135.2	40.1	603.6	33.1	69.1	8.2
436141 [5]	17.5	172.9	9.9	26.6	22.7	36.8	83.1	23.8	625.9	35.5	205.9	52.2	578.6	45.7	94.5	11.2
436143 [5]	21.9	182.3	18.5	26.9	42.7	42.5	73.7	12.1	423.6	32.2	144.2	26.8	295.7	21.3	47.3	6.0
436145 [4]	22.7	185.0	277.5	48.1	155.0	56.3	79.2	25.0	531.8	32.0	208.6	39.1	401.1	31.8	62.2	7.7
436146 [4]	22.2	191.2	466.8	44.9	174.4	50.5	83.5	31.0	376.6	34.6	174.9	39.2	366.0	29.0	58.7	7.1
436147 [4]	22.5	175.5	384.3	43.0	191.2	59.9	73.1	52.0	340.6	35.3	168.1	42.0	307.1	28.1	57.0	6.8
436148 [4]	23.3	167.1	355.5	40.0	172.0	48.9	68.4	80.5	297.8	38.8	145.1	39.5	254.3	22.2	45.1	5.4
436149 [4]	20.8	173.2	105.2	36.1	58.3	45.4	81.3	31.3	788.8	33.8	323.9	60.1	664.7	54.3	104.0	12.3
436188 [4]	22.4	186.6	105.8	37.4	55.5	48.6	86.5	35.4	933.4	35.1	339.3	73.1	762.1	65.9	123.2	13.8
436189 [4]	24.8	184.9	207.2	42.4	89.0	51.7	80.5	27.3	805.0	30.3	256.7	55.3	615.5	47.1	89.2	10.3
436190 [4]	25.4	198.6	153.9	40.0	76.1	55.5	80.1	35.4	882.6	31.5	265.1	64.9	731.2	58.8	109.3	12.0
436191 [4]	25.9	198.9	188.9	41.7	89.2	53.0	79.8	32.0	1107.9	31.3	257.2	78.6	831.6	73.3	134.0	14.9
436192 [4]	27.7	206.2	197.6	41.9	89.2	53.6	80.0	28.8	1110.8	31.9	261.6	76.0	813.9	70.9	130.5	14.4
436193 [4]	27.2	199.1	235.3	44.1	100.7	58.2	77.7	27.1	833.4	31.3	231.0	61.7	684.5	58.7	110.1	12.1
436186 [4]	23.9	189.4	183.6	42.5	90.6	51.2	80.4	38.0	991.4	30.8	256.6	77.1	845.2	73.7	134.9	14.5
436150 [4]	13.9	231.9	33.0	31.7	26.0	47.0	106.7	33.8	1856.0	28.5	362.6	138.8	2904.8	95.6	178.7	18.2
436187 [4]	25.1	183.9	103.8	36.3	56.1	44.4	79.6	23.3	866.6	33.5	319.0	59.7	625.0	51.9	99.8	12.4
404243 [5]	25.6	282.7	44.3	42.5	39.4	39.3	78.4	15.3	429.5	29.9	109.5	25.6	394.2	20.0	44.1	5.6
436152 [5]	37.5	221.2	304.6	67.7	156.5	47.6	75.7	6.3	250.7	31.9	105.6	19.5	184.8	15.6	34.4	4.4
BHVO-1 [3,4]	31.96	334.24	306.67	46.41	121.79	139.42	108.24	9.50	414.64	24.64	179.09	18.93	129.88	14.85	37.66	5.34
% std.err.(1s)	1.64%	1.41%	1.40%	0.95%	0.60%	1.07%	1.46%	0.23%	0.51%	2.97%	1.71%	1.64%	2.27%	2.35%	2.17%	1.97%
BHVO-1 [5]	30.23	315.06	289.85	43.97	118.85	138.68	104.94	9.48	396.99	27.15	169.17	18.35	132.79	15.43	38.48	5.46
% std.err.(1s)	7.45%	2.30%	1.68%	2.25%	2.26%	2.72%	2.66%	1.96%	1.86%	3.32%	1.48%	0.49%	2.12%	3.37%	1.34%	1.98%

Table DR2. (continued) Major (wt-%) and trace element (ppm) analyses of Miocene lavas and dikes from East Greenland.

Sample ID	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	Pb	Th	U	Yb/Dy	Nd/Dy	Zr/Hf
436156 [5]	30.9	6.54	2.15	6.97	1.01	6.21	1.17	3.17	0.48	3.09	0.450	3.84	2.47	2.56	3.72	0.82	0.50	4.98	40.1
436155 [5]	31.1	6.29	2.18	6.67	1.03	6.05	1.15	3.24	0.49	3.00	0.440	3.76	2.42	2.44	3.70	0.82	0.49	5.15	40.5
436154 [5]	30.0	6.00	2.12	6.65	1.00	5.90	1.15	3.15	0.47	2.94	0.446	3.37	2.06	2.23	3.27	0.74	0.50	5.08	41.1
436153 [5]	49.7	9.43	3.10	9.75	1.38	8.12	1.52	4.07	0.61	3.71	0.558	5.46	3.48	4.10	5.35	0.98	0.46	6.13	39.8
436151 [5]	32.1	6.37	2.09	6.85	0.92	5.36	1.04	2.74	0.40	2.56	0.385	3.52	2.61	2.68	3.47	0.67	0.48	5.98	38.4
436141 [5]	43.1	8.48	2.74	8.55	1.21	7.06	1.32	3.59	0.53	3.33	0.491	4.90	3.33	3.50	4.29	0.97	0.47	6.10	42.1
436143 [5]	25.8	5.88	2.10	6.65	1.03	6.10	1.18	3.14	0.48	3.04	0.452	3.75	1.70	1.32	1.86	0.44	0.50	4.23	38.4
436145 [4]	29.0	6.14	2.00	6.53	0.97	5.65	1.09	3.11	0.43	2.73	0.406	4.16	1.65	2.44	4.25	1.05	0.48	5.14	50.1
436146 [4]	26.9	5.74	1.84	6.36	0.98	5.85	1.13	3.30	0.47	2.97	0.441	3.68	1.79	2.92	3.95	1.01	0.51	4.59	47.5
436147 [4]	25.0	5.48	1.65	6.08	0.94	5.77	1.16	3.46	0.50	3.25	0.487	3.65	2.23	5.74	6.39	1.91	0.56	4.33	46.0
436148 [4]	20.2	4.72	1.36	5.29	0.92	5.80	1.23	3.67	0.54	3.70	0.558	3.61	2.45	8.15	8.16	2.52	0.64	3.49	40.2
436149 [4]	43.6	8.47	2.58	8.66	1.18	6.50	1.20	3.35	0.44	2.75	0.403	6.10	2.57	5.07	6.80	1.24	0.42	6.71	53.1
436188 [4]	48.1	8.96	2.74	9.18	1.23	6.77	1.23	3.43	0.44	2.80	0.416	6.26	3.10	5.62	8.11	1.94	0.41	7.11	54.2
436189 [4]	37.2	7.22	2.27	7.38	1.02	5.72	1.06	3.01	0.39	2.53	0.362	4.93	2.58	3.87	5.35	1.13	0.44	6.49	52.1
436190 [4]	42.3	7.74	2.41	8.09	1.06	5.93	1.09	3.10	0.41	2.56	0.383	4.98	2.70	4.47	6.52	1.52	0.43	7.13	53.2
436191 [4]	51.0	8.59	2.60	8.96	1.13	6.09	1.11	3.14	0.41	2.59	0.384	4.92	3.19	5.52	8.42	1.59	0.43	8.39	52.3
436192 [4]	48.8	8.68	2.57	8.71	1.12	6.22	1.15	3.19	0.42	2.69	0.394	5.05	3.14	5.20	7.88	1.89	0.43	7.83	51.8
436193 [4]	41.4	7.62	2.30	7.95	1.02	5.73	1.07	3.03	0.39	2.49	0.365	4.31	2.61	8.96	6.38	1.37	0.43	7.23	53.6
436186 [4]	48.6	8.33	2.47	8.70	1.09	6.00	1.06	3.07	0.40	2.52	0.372	4.75	3.18	5.37	8.23	2.11	0.42	8.10	54.0
436150 [4]	65.4	10.52	2.80	10.73	1.18	5.91	0.99	2.74	0.34	2.15	0.309	6.45	6.19	6.24	12.27	3.07	0.36	11.06	56.2
436187 [4]	48.5	9.24	2.91	9.77	1.35	7.62	1.38	3.84	0.51	3.18	0.463	6.84	2.91	5.30	7.49	1.66	0.42	6.37	46.6
404243 [5]	23.6	5.26	1.83	5.97	0.87	5.41	1.13	2.93	0.45	2.81	0.443	2.84	1.87	1.85	1.66	0.40	0.52	4.36	38.5
436152 [5]	19.1	4.66	1.67	5.44	0.94	5.93	1.17	3.27	0.50	3.19	0.501	2.86	1.26	1.11	1.40	0.34	0.54	3.21	37.0
BHVO-1 [3,4]	23.16	5.72	1.94	5.84	0.93	5.20	0.93	2.43	0.31	1.89	0.264	4.34	1.14	2.14	0.78	0.42	0.36	4.46	41.3
% std.err.(1s)	1.77%	1.22%	1.75%	2.14%	1.51%	0.99%	0.96%	1.43%	1.47%	1.29%	2.21%	0.65%	2.32%	2.38%	9.51%	3.92%			
BHVO-1 [5]	24.5	6.09	2.03	6.25	0.95	5.26	0.98	2.44	0.34	1.98	0.288	4.35	1.23	2.20	1.23	0.42	0.38	4.67	38.9
% std.err.(1s)	1.93%	2.23%	1.71%	1.02%	1.14%	1.55%	2.65%	2.81%	2.93%	3.01%	2.57%	2.19%	2.09%	9.38%	3.54%	2.42%			

Table DR3 Sr, Nd and Pb isotopes of Miocene lavas and other postbreakup rocks.

Sample	Type [1]	Localities and flow numbers [1]	Age (Ma)	Rb/Sr [1]	$^{87}Sr/^{86}Sr$ measured	+/- 2s	$^{87}Sr/^{86}Sr$ initial [2]	Sm/Nd [1]	$^{143}Nd/^{144}Nd$ measured	+/- 2s	$^{143}Nd/^{144}Nd$ initial [2]	U/[
436155	Lava	Nunatak-24	13.6	0.024	0.704235	0.000011	0.704222	0.202	0.512859	######	0.512848	0.
436154	Lava	Nunatak-23	13.6	0.028	0.703986	0.000017	0.703971	0.200	0.512834	######	0.512823	0.
436153	Lava	Nunatak-22	13.6	0.038	0.704543	0.000015	0.704522	0.190	0.512729	######	0.512719	0.
436143	Lava	Vindtop-13	13.6	0.029	0.703603	0.000014	0.703588	0.228	0.512858	######	0.512845	0.
436147	C. Lava	Vindtop-10	13.6	0.153	0.704261	0.000014	0.704179	0.219	0.512805	######	0.512793	0.
436148	C. Lava	Vindtop-09	13.6	0.270	0.704624	0.000014	0.704478	0.234	0.512764	######	0.512751	0.
436189	Lava	Vindtop-06	13.6	0.034	0.703839	0.000015	0.703820	0.194	0.512867	######	0.512856	0.
436190	Lava	Vindtop-05	13.6	0.040	0.703988	0.000017	0.703966	0.183	0.512877	######	0.512867	0.
436191	Lava	Vindtop-04	13.6	0.029	0.704035	0.000011	0.704019	0.168	0.512852	######	0.512843	0.
436150	Dike	Dike in Vindtop-08	13.6	0.018	0.703641	0.000015	0.703631	0.161	0.512892	######	0.512883	0.
436150 [4]	Dike	replicate analysis	13.6	N.D.	0.703652	0.000017	0.703642	N.D.	0.512889	######	0.512880	N.
404243	Dike	Dike Borggraven	13.6	0.036	0.704245	0.000012	0.704226	0.223	0.512800	######	0.512788	0.
436152	Dike	Dike in Nunatak-24	13.6	0.025	0.703963	0.000020	0.703949	0.244	0.512879	######	0.512865	0.
412243	Lava	Above Skrænterne Fl	54	0.008	0.703556	0.000011	0.703539	0.283	0.512962	######	0.512900	0.
412251	Lava	Above Skrænterne Fl	54	0.096	0.704934	0.000016	0.704728	0.216	0.512655	######	0.512607	0.
437329 [3]	Peridotite	Lilloise intrusion	50	0.010	0.703584	0.000013	0.703564	0.333	0.512917	######	0.512849	0.
437336 [3]	Gabbro	Lilloise intrusion	50	0.040	0.703674	0.000015	0.703594	0.333	0.512924	######	0.512856	0.
458029 [3]	Syeno-diorite	Borgtinderne	46.8	0.075	0.703673	0.000014	0.703488	0.333	0.512840	######	0.512842	0.
458051 [3]	Felsic syenite	Borgtinderne	46.8	0.400	0.704300	0.000023	0.704115	0.333	0.512836	######	0.512839	0.

[1] Type and locality information from Table DR2. Element ratios calculated from values in Table DR2.

[2] Values corrected to time of extrusion. Age of Borgtinderne measured on amphibole (46.8 +/- 0.4 Ma) by M. Storey.

[3] Rb/Sr, Sm/Nd, U/Pb, Th/Pb for the Lilloise and Borgtinderne samples are estimated from mineralogy.

[4] Replicate analyses of isotopic composition of different rock aliquot of sample 436150

N.D. Not determined. Where indicated there is no separate determination for the replicate of sample 436150.

Table DR3

Sample	Th/Pb [1]	$^{206}Pb/^{204}Pb$ measured	$^{207}Pb/^{204}Pb$ measured	$^{208}Pb/^{204}Pb$ measured	206Pb/204Pb initial [2]	207Pb/204Pb initial [2]	208Pb/204Pb initial [2]
436155	1.52	17.685	15.280	38.083	17.634	15.278	38.010
436154	1.47						
436153	1.30	16.889	15.132	37.334	16.854	15.131	37.273
436143	1.41	17.486	15.261	37.445	17.436	15.259	37.378
436147	1.20	15.805	14.919	37.065	15.753	14.916	37.010
436148	1.08	15.456	14.852	36.923	15.408	14.850	36.873
436189	1.49	17.786	15.338	38.001	17.739	15.336	37.929
436190	1.57	17.904	15.356	38.048	17.849	15.353	37.971
436191	1.65	18.004	15.368	38.140	17.957	15.365	38.059
436150	1.97	18.515	15.452	38.610	18.439	15.448	38.512
436150 [4]	N.D.	18.506	15.452	38.596	18.430	15.449	38.498
404243	0.90	17.129	15.214	37.297	17.097	15.213	37.254
436152	1.26	17.627	15.264	37.656	17.581	15.262	37.596
412243	0.70	17.942	15.364	37.962	17.819	15.358	37.826
412251	0.65	16.289	14.988	36.844	16.193	14.983	36.723
437329 [3]	0.63	18.231	15.398	38.090	18.006	15.388	37.976
437336 [3]	0.63	18.231	15.398	38.090	18.006	15.388	37.976
458029 [3]	1.27	18.230	15.386	38.440	18.089	15.379	38.226
458051 [3]	0.33	18.154	15.387	38.138	18.014	15.380	38.082