GSA Data Repository Item # 8714

Title of article $^{40}Ar/^{39}Ar$ Mineral Age Record of Polyphase Tectonothermal Evolution in the Southern Mauritanide Orogen, Southeastern Senegal

Author(s) R. D. Dallmeyer and Michel Villeneuve

see Bulletin v. 98, p. 602 - 611

Contents 8 pages

Tables A - D, Analytical Data for Incremental Heating Experiments

Table A $^{40}Ar/^{39}Ar$ Analytical Data For Incremental Heating Experiments on Hornblende From The Niokolo-Koba and Gamon Granites, Southeastern Senegal.

Release temp (°C)	$(^{40}Ar/^{39}Ar)^*$	$(^{36}Ar/^{39}Ar)^*$	$(^{37}Ar/^{39}Ar)^c$	^{39}Ar % of total	% ^{40}Ar non-atmos.+	$^{36}Ar_{Ca}$ %	Apparent Age (Ma)**
				Niokolo-Koba Granite			
Sample 6; J = 0.009023							
550	362.14	0.48527	71.675	1.47	61.99	4.02	2053.8 ± 42.8
600	121.41	0.21538	8.236	0.54	48.12	1.04	767.1 ± 50.5
675	64.88	0.07918	5.650	1.75	64.63	1.94	580.7 ± 37.4
725	75.92	0.08803	10.567	1.11	66.85	3.26	683.9 ± 32.1
750	104.53	0.10487	18.621	1.35	71.78	4.83	941.3 ± 45.5
775	90.64	0.05691	16.863	2.82	82.93	8.06	941.9 ± 15.0
800	70.93	0.03010	14.093	6.26	89.05	12.73	819.5 ± 9.8
825	57.67	0.01642	12.802	25.21	93.36	21.20	719.1 ± 3.3
850	54.24	0.01123	12.749	33.66	95.76	30.88	698.1 ± 1.8
875	60.85	0.02173	13.643	12.94	91.24	17.08	737.9 ± 4.0
900	68.78	0.04487	12.797	9.49	82.21	7.76	748.6 ± 7.6
Fusion	211.55	0.52308	12.728	3.40	27.42	0.66	764.3 ± 10.8
Total	70.75	0.04834	13.853	100.00	88.23	19.93	751.4 ± 7.8
Sample 7; J = 0.009098							
550	436.76	0.72546	11.344	0.48	51.12	0.43	2009.5 ± 103.0
600	380.05	0.78463	7.221	0.24	39.14	0.25	1548.8 ± 171.6
650	163.57	0.33875	9.993	0.47	39.29	0.80	834.8 ± 86.6
675	158.99	0.30625	16.300	0.29	43.90	1.45	894.3 ± 52.8
700	105.17	0.11236	16.696	0.67	69.70	4.04	929.5 ± 54.3
720	84.78	0.05948	14.306	1.18	80.62	6.54	878.6 ± 34.0
740	63.97	0.03433	12.051	3.62	85.65	9.55	734.2 ± 14.1
760	52.01	0.01389	11.198	17.07	93.83	21.93	666.7 ± 3.2
775	51.37	0.01335	11.214	9.14	94.06	22.85	661.3 ± 4.8
790	49.51	0.01054	11.205	13.77	95.52	28.92	649.4 ± 2.8
810	49.28	0.00974	11.473	16.08	96.02	32.04	649.9 ± 1.9
835	50.48	0.00847	11.642	19.88	96.89	37.40	668.1 ± 1.7
860	52.01	0.01233	11.142	6.32	94.70	24.57	671.9 ± 7.0
Fusion	59.23	0.03543	11.127	10.78	83.82	8.54	676.4 ± 3.8
Total	56.28	0.02342	11.426	100.00	92.67	25.34	679.5 ± 5.8

Table A Continued, page 2.

Sample 9; J = 0.008873

500	251.64	0.42776	8.691	0.35	50.04	0.55	1358.6 ± 104.2
550	100.62	0.17165	4.494	0.39	49.94	0.71	666.8 ± 75.1
600	97.92	0.17486	3.277	0.40	47.49	0.51	624.3 ± 72.9
635	89.04	0.18703	5.240	0.31	38.39	0.76	479.3 ± 88.7
670	90.20	0.12831	16.119	0.57	59.40	3.42	707.6 ± 80.7
705	63.97	0.03455	13.833	2.47	85.77	10.89	720.7 ± 14.0
740	50.61	0.00739	8.089	20.00	96.96	29.77	654.9 ± 1.9
770	48.22	0.00447	7.473	48.37	98.49	45.44	636.9 ± 0.8
790	48.73	0.00500	8.006	14.96	98.28	43.56	641.5 ± 2.3
810	49.73	0.00710	8.359	8.03	97.12	32.02	646.3 ± 2.5
830	53.42	0.01668	8.060	2.72	91.98	13.14	655.6 ± 9.5
860	68.42	0.06751	7.908	0.75	71.76	3.19	655.2 ± 35.5
Fusion	430.33	1.25025	8.173	0.68	14.30	0.18	789.2 ± 120.6
Total	53.66	0.01947	7.945	100.00	95.80	37.70	648.1 ± 4.7

Sample 10; J = 0.009020

550	99.99	0.14398	23.971	1.92	59.37	4.53	783.3 ± 32.8
600	90.09	0.18627	4.472	0.81	39.30	0.65	501.2 ± 27.8
650	66.93	0.12736	10.062	1.37	44.97	2.15	435.7 ± 8.8
675	70.95	0.10907	23.171	0.91	57.19	5.78	569.8 ± 31.4
700	60.16	0.05690	20.806	2.48	74.82	9.95	621.6 ± 13.8
720	59.66	0.04388	15.490	1.88	80.34	9.60	653.6 ± 16.2
740	52.47	0.02079	11.934	5.02	90.11	15.62	644.9 ± 7.7
760	50.26	0.01498	10.464	13.28	92.85	19.00	637.3 ± 4.0
780	48.48	0.01116	9.933	16.97	94.83	24.21	629.1 ± 4.7
800	46.93	0.00699	9.622	30.49	97.23	37.44	625.1 ± 1.7
815	46.61	0.00751	10.054	20.60	96.96	36.43	620.2 ± 2.1
840	53.14	0.02812	12.635	2.77	86.26	12.22	628.5 ± 13.8
Fusion	164.84	0.39402	12.319	1.49	29.96	0.85	669.1 ± 27.9
Total	52.20	0.02450	10.867	100.00	91.37	27.29	627.5 ± 6.2

Table A. Continued, page 3.

Gamon Granite

Sample 5; J = 0.009095

550	271.13	0.27319	5.471	0.56	70.38	0.54	1819.5 ± 39.4
600	172.53	0.12827	3.017	0.69	78.17	0.64	1446.0 ± 18.1
650	58.89	0.09557	3.832	0.95	52.56	1.09	448.4 ± 20.7
675	63.58	0.07930	11.905	1.01	64.64	4.08	576.6 ± 17.8
700	75.23	0.04777	14.259	1.68	82.75	8.12	815.4 ± 11.4
720	74.87	0.04017	10.289	1.74	85.24	6.97	830.1 ± 11.8
740	58.82	0.01344	7.327	7.01	94.24	14.83	739.3 ± 2.9
760	50.02	0.00554	6.216	26.51	97.72	30.54	665.7 ± 2.8
780	47.86	0.00413	5.849	31.86	98.42	38.55	645.3 ± 1.8
800	47.38	0.00393	5.964	20.23	98.55	41.24	640.5 ± 2.1
825	49.71	0.00644	6.969	5.11	97.28	29.41	660.0 ± 4.0
850	52.82	0.01761	6.591	1.78	91.14	10.18	657.3 ± 16.2
Fusion	124.55	0.24950	6.413	0.86	41.21	0.70	693.5 ± 44.8
Total	53.25	0.01294	6.387	100.00	95.72	31.77	673.3 ± 4.1

*measured.

[c]corrected for post-irradiation decay of ^{37}Ar (35.1 day 1/2-life).

+ $[\,^{40}Ar_{tot.} - (^{36}Ar_{atmos.})\,(295.5)]\ /\ ^{40}Ar_{tot.}$.

**calculated using correction factors of Dalrymple et al. (1981); two sigma error estimates.

Table B $^{40}Ar/^{39}Ar$ Analytical Data For An Incremental Heating Experiment on Plagioclase From Rhyolite In The Niololo-Koba Group, Southeastern Senegal.

Release temp (°C)	$(^{40}Ar/^{39}Ar)$*	$(^{36}Ar/^{39}Ar)$*	$(^{37}Ar/^{39}Ar)^c$	^{39}Ar % of total	% ^{40}Ar non-atmos.+	$^{36}Ar_{Ca}$ %	Apparent Age (Ma)**
Sample 8; J = 0.008925							
525	42.72	0.01125	0.008	15.08	92.21	0.02	543.5 ± 1.3
550	45.28	0.00892	0.012	14.16	94.17	0.04	581.7 ± 4.0
575	31.49	0.00393	0.022	7.35	96.30	0.15	432.1 ± 1.5
625	30.17	0.00657	0.061	9.69	93.68	0.25	412.3 ± 1.2
675	28.78	0.00638	0.101	8.86	93.45	0.43	388.1 ± 1.2
725	37.37	0.00979	0.176	8.53	92.28	0.49	484.1 ± 1.3
775	55.90	0.01425	0.202	11.32	92.49	0.39	684.5 ± 1.1
825	107.26	0.02225	0.310	14.68	93.89	0.38	1156.9 ± 1.3
875	103.22	0.02782	0.314	5.30	92.05	0.31	1108.0 ± 1.8
925	89.54	0.03413	0.361	2.26	88.76	0.29	967.3 ± 3.2
975	97.19	0.06491	0.282	1.33	80.28	0.12	953.5 ± 10.4
Fusion	99.33	0.10121	0.210	1.44	69.90	0.06	870.1 ± 3.1
Total	56.17	0.01473	0.134	100.00	92.76	0.25	664.9 ± 1.9

*measured.

[c]corrected for post-irradiation decay of ^{37}Ar (35.1 day 1/2-life).

+ $[^{40}Ar_{tot.} - (^{36}Ar_{atmos.})(295.5)] / {}^{40}Ar_{tot.}$.

**calculated using correction factors of Dalrymple et al. (1981); two sigma error estimates.

Table C $^{40}Ar/^{39}Ar$ Analytical Data For Incremental Heating Experiments On Muscovite From The Simenti and Guinguan Groups and Mylonitic Granite, Southeastern Senegal.

Release temp (°C)	$(^{40}Ar/^{39}Ar)^*$	$(^{36}Ar/^{39}Ar)^*$	$(^{37}Ar/^{39}Ar)^c$	^{39}Ar % of total	% ^{40}Ar non-atmos.+	$^{36}Ar_{Ca}$ %	Apparent Age (Ma)**
				Mylonitic Granite			
Sample 1; J = 0.008990							
475	25.00	0.03187	0.031	1.93	62.31	0.03	236.5 ± 3.4
525	20.68	0.00593	0.015	9.24	91.51	0.07	283.4 ± 1.6
550	19.51	0.00339	0.006	12.56	94.84	0.05	277.6 ± 0.6
575	19.08	0.00239	0.007	14.56	96.27	0.08	275.7 ± 1.1
600	19.13	0.00240	0.004	15.37	96.26	0.05	276.4 ± 0.6
625	19.48	0.00265	0.005	15.54	95.95	0.06	280.1 ± 0.8
665	19.42	0.00272	0.006	14.51	95.83	0.06	279.0 ± 0.8
700	19.27	0.00295	0.009	10.40	95.45	0.08	276.0 ± 0.8
750	19.12	0.00403	0.043	4.32	93.76	0.29	269.6 ± 2.8
800	20.39	0.01159	0.396	0.87	83.33	0.93	256.5 ± 13.1
Fusion	43.59	0.07184	0.247	0.70	51.33	0.09	330.6 ± 33.7
Total	19.72	0.00419	0.014	100.00	94.26	0.08	277.2 ± 1.3
Total without 475, 525, 750, 800°C and Fusion				82.94			278.1 ± 0.8
Sample 2; J = 0.008945							
475	19.94	0.01377	0.019	1.79	79.57	0.04	239.4 ± 2.9
500	19.28	0.00506	0.006	1.14	92.22	0.03	266.2 ± 3.3
525	18.98	0.00303	0.005	2.58	95.25	0.04	270.4 ± 1.9
550	18.28	0.00098	0.004	8.14	98.39	0.10	269.1 ± 0.5
575	18.20	0.00087	0.002	10.87	98.56	0.05	268.5 ± 0.5
600	18.28	0.00087	0.001	15.16	98.55	0.04	269.6 ± 0.5
635	18.32	0.00087	0.000	19.89	98.56	0.01	270.1 ± 0.4
675	18.50	0.00095	0.001	11.44	98.45	0.02	272.3 ± 0.6
725	18.58	0.00109	0.001	13.30	98.24	0.02	272.8 ± 0.6
800	18.72	0.00119	0.006	15.51	98.09	0.13	274.4 ± 0.6
Fusion	45.09	0.09118	0.294	0.18	40.28	0.09	271.6 ± 37.4
Total	18.52	0.00146	0.002	100.00	97.81	0.04	270.4 ± 0.7
Total without 475, 500°C and Fusion				96.90			271.1 ± 0.6

Table C Continued, page 2.

Simenti Group

Sample 4; J = 0.008830

475	33.08	0.00669	0.009	4.35	94.01	0.04	437.7 ± 1.0
550	37.31	0.00280	0.006	2.37	97.77	0.06	503.7 ± 1.8
525	36.76	0.00182	0.001	4.41	98.52	0.02	500.5 ± 1.1
550	36.80	0.00112	0.003	3.20	99.08	0.08	503.5 ± 2.3
575	36.85	0.00094	0.000	4.70	99.23	0.01	504.7 ± 2.0
600	37.56	0.00062	0.001	6.24	99.50	0.02	514.5 ± 1.3
625	38.56	0.00088	0.001	6.42	99.31	0.04	525.5 ± 1.0
665	39.45	0.00105	0.002	5.82	99.20	0.04	535.5 ± 1.3
700	40.29	0.00092	0.001	7.56	99.34	0.04	545.8 ± 1.3
720	40.59	0.00139	0.000	3.52	98.97	0.01	547.7 ± 1.9
740	40.84	0.00128	0.003	3.97	99.06	0.06	551.0 ± 1.2
760	40.90	0.00127	0.000	4.93	99.07	0.00	551.8 ± 0.8
800	41.07	0.00122	0.000	7.47	99.11	0.01	553.9 ± 0.6
830	41.14	0.00091	0.001	11.67	99.33	0.02	555.8 ± 0.8
875	41.63	0.00076	0.002	17.04	99.44	0.06	562.0 ± 0.5
Fusion	46.03	0.02518	0.002	6.32	85.12	0.00	565.8 ± 0.7
Total	40.21	0.00283	0.000	100.00	98.08	0.02	538.0 ± 1.1

Guinguan Group

Sample 11; J = 0.009025

475	40.02	0.01181	0.010	2.75	91.27	0.02	513.9 ± 2.3
500	49.20	0.00422	0.003	4.97	97.46	0.02	648.7 ± 0.8
525	49.94	0.00273	0.000	5.00	98.37	0.00	662.1 ± 0.8
550	49.55	0.00145	0.000	9.56	99.12	0.01	661.9 ± 0.8
575	49.03	0.00104	0.001	11.16	99.36	0.04	657.5 ± 1.4
600	48.98	0.00124	0.001	12.32	99.24	0.02	656.1 ± 1.1
625	49.14	0.00119	0.002	10.47	99.27	0.05	658.1 ± 0.8
665	49.34	0.00147	0.002	9.52	99.11	0.04	659.5 ± 0.7
690	49.29	0.00103	0.002	12.12	99.37	0.06	660.4 ± 0.7
720	49.33	0.00069	0.002	12.43	99.58	0.09	662.0 ± 0.7
750	49.87	0.00113	0.001	8.57	99.32	0.02	666.6 ± 1.1
Fusion	52.47	0.00712	0.000	1.13	95.98	0.00	675.9 ± 4.3
Total	49.10	0.00173	0.001	100.00	98.91	0.04	655.8 ± 1.0
Total without 475, 500°C and Fusion				86.15			659.5 ± 0.9

Table C Continued, page 3.

Sample 12; J = 0.008675

475	43.33	0.02051	0.018	1.07	86.00	0.02	505.4 ± 4.1
500	50.72	0.00685	0.010	1.51	96.00	0.04	635.6 ± 2.6
525	51.15	0.00457	0.007	2.32	97.35	0.04	647.8 ± 1.8
550	51.13	0.00241	0.003	8.48	98.59	0.03	654.5 ± 1.2
575	51.34	0.00273	0.002	11.47	98.42	0.02	655.7 ± 0.7
600	51.29	0.00257	0.001	13.21	98.51	0.01	655.7 ± 1.0
625	51.13	0.00193	0.001	16.88	98.87	0.01	656.0 ± 0.6
675	51.02	0.00147	0.002	19.57	99.13	0.04	656.3 ± 0.7
725	51.17	0.00154	0.001	16.76	99.10	0.03	657.7 ± 0.7
775	52.06	0.00294	0.024	5.66	98.32	0.22	662.9 ± 1.2
Total	51.48	0.00351	0.006	100.00	98.07	0.01	654.7 ± 1.0
Total without 475-525, 775°C and Fusion				86.37			656.2 ± 0.8

Sample 13; J = 0.008735

475	39.39	0.01049	0.006	2.53	92.12	0.02	496.7 ± 1.2
500	55.84	0.00355	0.001	4.76	98.11	0.01	705.5 ± 0.6
525	54.92	0.00261	0.003	4.78	95.58	0.03	698.6 ± 1.4
550	52.75	0.00121	0.004	10.17	99.31	0.08	679.7 ± 1.3
575	51.60	0.00104	0.005	14.17	99.39	0.13	667.8 ± 0.7
600	51.64	0.00133	0.003	12.46	99.23	0.07	667.3 ± 0.7
625	52.11	0.00195	0.003	7.57	98.88	0.04	670.4 ± 1.1
665	52.01	0.00164	0.004	8.44	99.06	0.06	670.3 ± 1.1
700	51.27	0.00084	0.005	14.96	99.50	0.15	664.8 ± 0.7
750	51.11	0.00076	0.004	19.24	99.55	0.15	663.4 ± 0.5
800	57.94	0.01286	0.011	0.81	93.43	0.02	698.5 ± 8.0
Fusion	80.94	0.09590	0.031	0.12	64.98	0.01	682.0 ± 37.0
Total	51.79	0.00177	0.003	100.00	98.97	0.09	667.3 ± 0.9
Total without 475-550, 800°C and Fusion				76.83			666.6 ± 0.7

*measured.

[c]corrected for post-irradiation decay of ^{37}Ar (35.1 day 1/2-life).

+ $[\ ^{40}Ar_{tot.} - (^{36}Ar_{atmos.})\ (295.5)\ ]\ /\ ^{40}Ar_{tot.}$.

**calculated using correction factors of Dalrymple et al. (1981); two sigma error estimates.

Table D. $^{40}Ar/^{39}Ar$ Analytical Data For An Incremental Release Heating Experiment On A Whole-Rock Phyllite From The Simenti Group. Southeastern Senegal.

PLEASE CHANGE "4" TO "D."

Rel temp	*	$(^{36}Ar/^{39}Ar)$*	$(^{37}Ar/^{39}Ar)^c$	^{39}Ar % of total	% ^{40}Ar non-atmos.+	$^{36}Ar_{Ca}$ %	Apparent Age (Ma)**
Samp							
400		0.05602	0.043	0.39	41.56	0.02	186.1 ± 13.8
425		0.03798	0.041	0.42	54.97	0.03	214.9 ± 16.0
450		0.02872	0.040	0.89	61.20	0.04	210.2 ± 6.7
475		0.01507	0.002	2.47	74.09	0.00	200.7 ± 2.1
500	.....	0.00770	0.004	4.18	85.84	0.02	216.7 ± 1.4
535	17.08	0.00354	0.007	10.85	93.84	0.04	248.9 ± 0.5
570	17.06	0.00188	0.007	14.13	96.70	0.11	255.6 ± 0.6
605	16.68	0.00085	0.007	18.09	98.46	0.21	254.6 ± 0.4
640	16.52	0.00064	0.007	18.16	98.81	0.29	253.2 ± 0.4
675	16.63	0.00061	0.005	13.15	98.87	0.22	254.9 ± 0.5
710	16.68	0.00070	0.006	6.88	98.71	0.21	255.2 ± 0.7
750	16.93	0.00128	0.006	4.78	97.73	0.14	256.4 ± 1.6
800	17.10	0.00168	0.001	3.82	97.06	0.01	257.2 ± 0.9
Fusion	17.78	0.00427	0.010	1.80	92.87	0.06	255.9 ± 4.4
Total	16.90	0.00258	0.005	100.00	95.79	0.16	250.4 ± 0.9
Total without 400-535°C				80.81			254.8 ± 0.7

*measured.

[c]corrected for post-irradiation decay of ^{37}Ar (35.1 day 1/2-life).

+ $[\,^{40}Ar_{tot.} - (^{36}Ar_{atmos.})\,(295.5)\,]\ /\ ^{40}Ar_{tot.}$.

**calculated using correction factors of Dalrymple et al. (1981); two sigma error estimates.