Supplementary Data File 1. Ar-Ar data, plots and comments
Supplied by Phil Gans

Note all errors in this supplementary data file are one sigma.
Samples listed in SB number order.
t = dwell time in minutes.
40(mol) = moles corrected for blank and reactor-produced 40.
Ratios are corrected for blanks, decay, and interference.
∑39Ar is cumulative, 40Ar* = rad fraction.

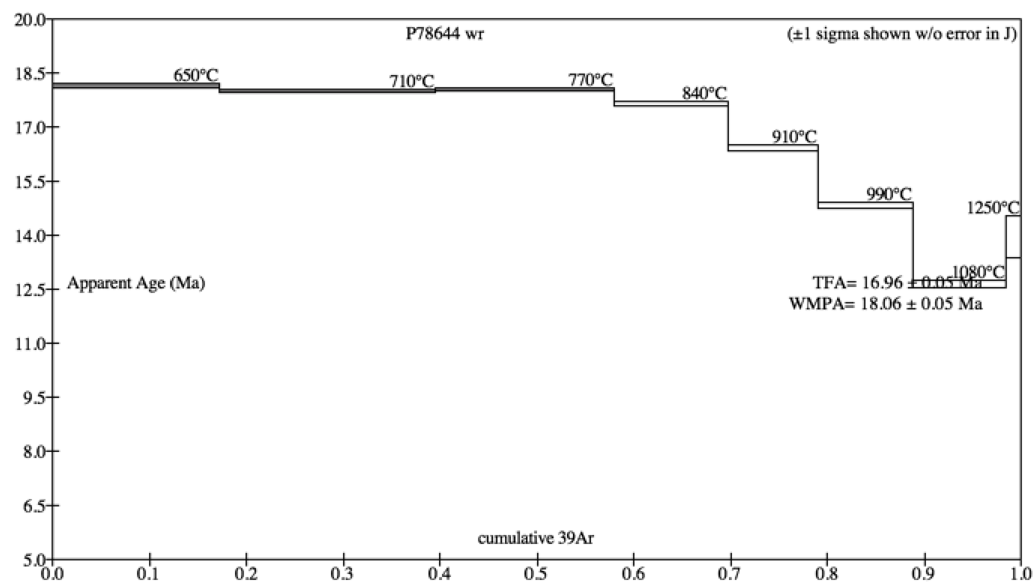
SB61-108. P78644 wr

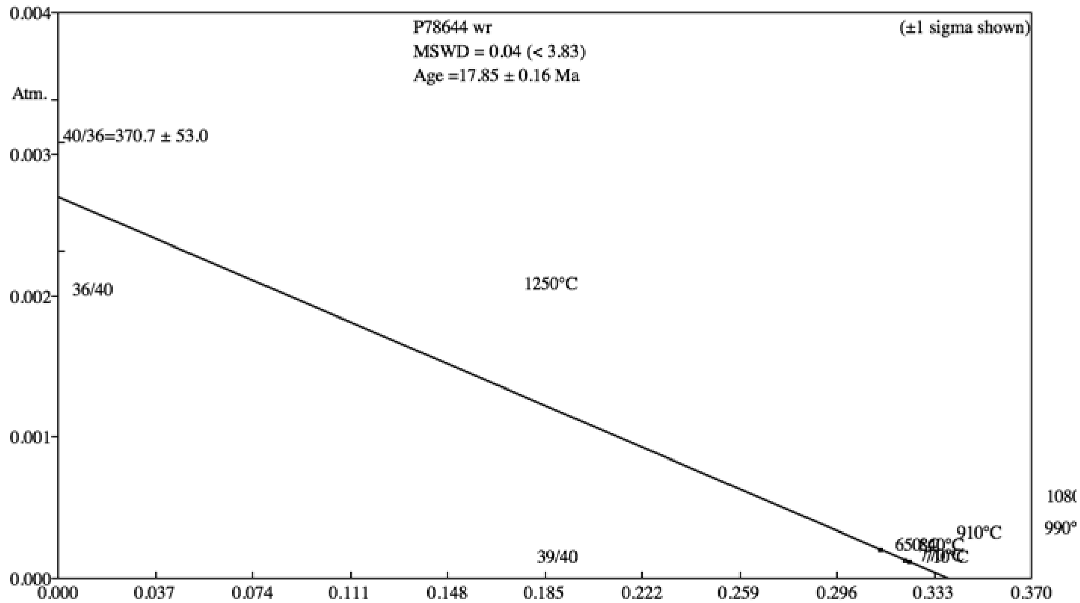
J=0.0033643

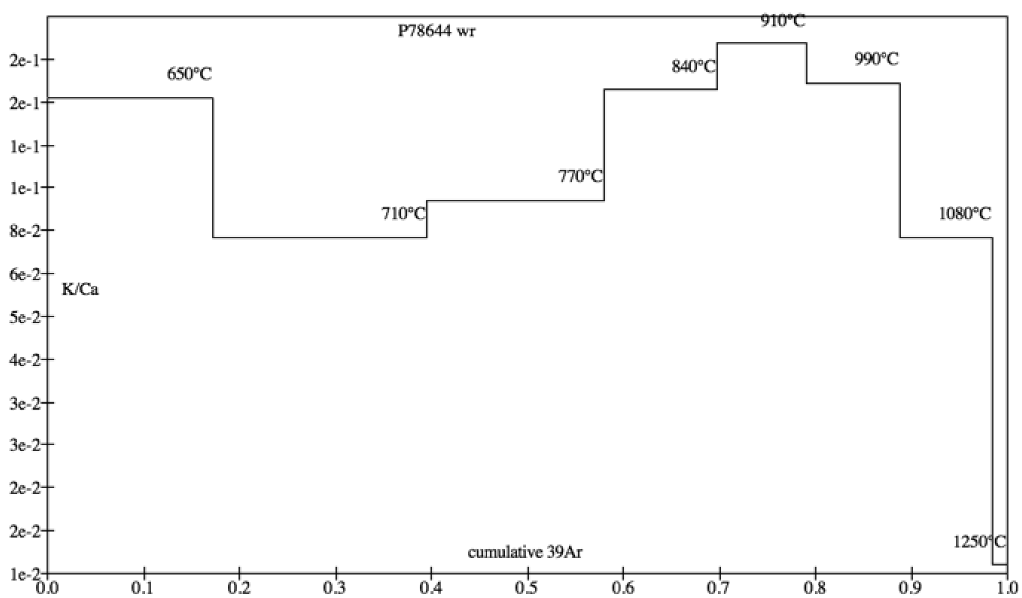
T	t	40(mol)	40/39	38/39	37/39	36/39	K/Ca	∑ 39Ar	40Ar*	Age (Ma)
650	15	4.3e-14	3.2000	0.0e+0	3.0290	0.0007	0.16	0.17274	0.939	18.1 ± 0.1
710	15	5.3e-14	3.0884	0.0e+0	6.4298	0.0004	0.076	0.39611	0.965	18.0 ± 0.1
770	15	4.4e-14	3.1066	0.0e+0	5.2708	0.0004	0.093	0.58003	0.962	18.0 ± 0.1
840	15	2.8e-14	3.1055	0.0e+0	2.9059	0.0006	0.17	0.69830	0.940	17.6 ± 0.1
910	15	2.1e-14	2.9735	0.0e+0	2.2679	0.0009	0.22	0.79012	0.914	16.4 ± 0.1
990	15	2.0e-14	2.7081	6.0e-4	2.8051	0.0009	0.17	0.88833	0.907	14.8 ± 0.1
1080	15	1.8e-14	2.4885	2.6e-3	6.4312	0.0013	0.076	0.98404	0.841	12.7 ± 0.1
1250	15	7.0e-15	5.8374	3.2e-3	37.3896	0.0119	0.013	1.00000	0.395	14.0 ± 0.6

Total fusion age, TFA= 16.96 ± 0.05 Ma (including J)
Weighted mean plateau age, WMPA= 18.06 ± 0.05 Ma (including J)
Inverse isochron age =17.85 ± 0.16 Ma. (MSWD =0.04; 40Ar/36Ar=370.7 ± 10.6)
Steps used: 650, 710, 770, (1–3/8 or 58% ∑ 39Ar)

SB61-108. P78644 whole rock. Preferred age = 18.06 ± 0.10 Ma
Comment: Excellent flat plateau for first 58%, then ages drop (recoil?). Isochron age = 17.85 ± 0.32 Ma




P78644 wr
MSWD = 0.04 (< 3.83)
Age =17.85 ± 0.16 Ma
(±1 sigma shown)
Atm.
40/36=370.7 ± 53.0
36/40
1250°C
39/40
910°C
990°
0.004
0.003
0.002
0.001
0.000
0.000
0.037
0.074
0.111
0.148
0.185
0.222
0.259
0.296
0.333
0.370


P78644 wr
650°C
710°C
770°C
840°C
910°C
990°C
1080°C
1250°C
K/Ca
cumulative 39Ar
2e-1
2e-1
1e-1
1e-1
8e-2
6e-2
5e-2
4e-2
3e-2
3e-2
2e-2
2e-2
1e-2
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

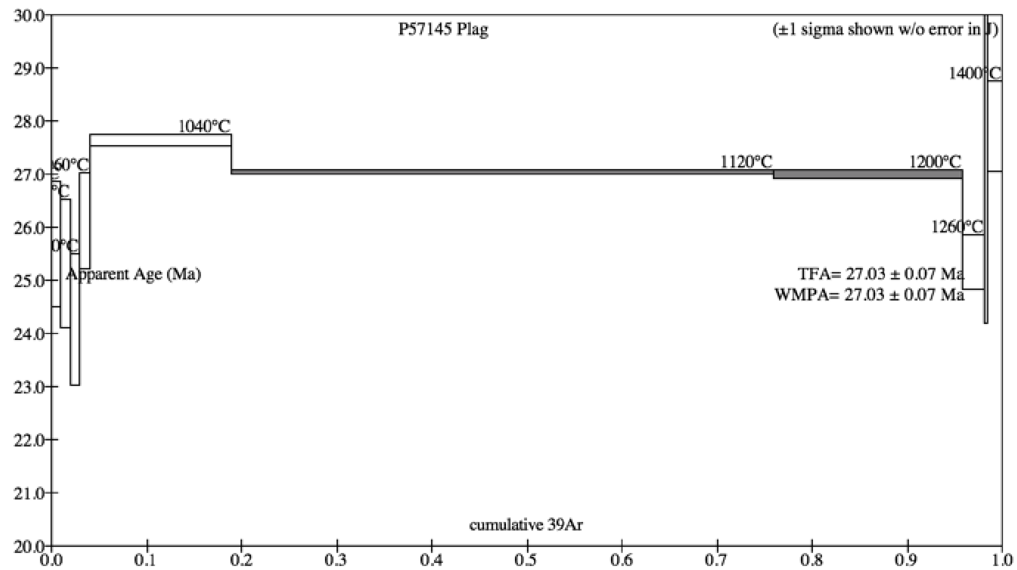
SB63-5. P57145 Plag

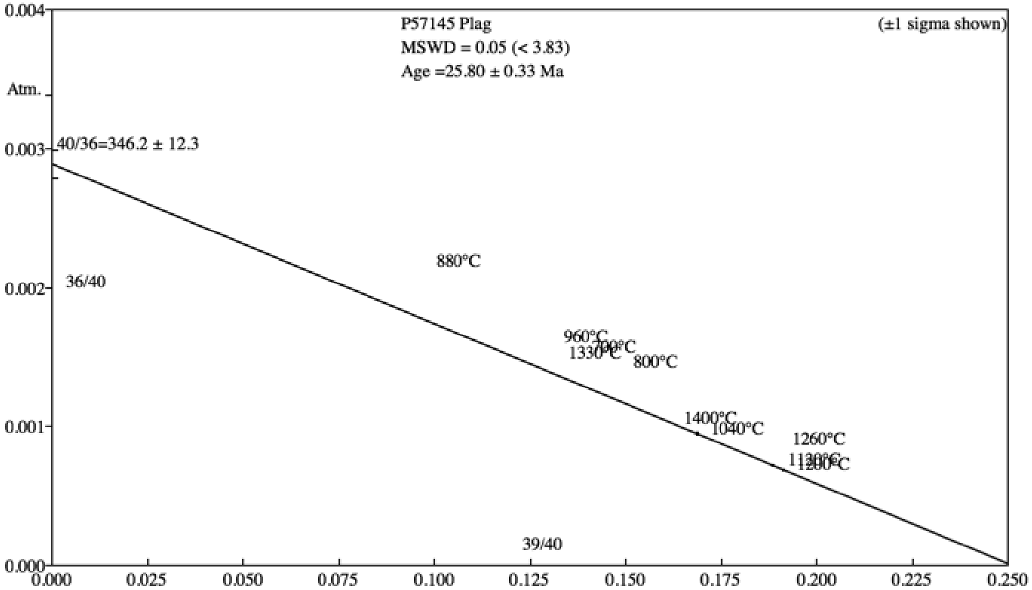
J=0.0036199

T	t	40(mol)	40/39	38/39	37/39	36/39	K/Ca	∑ 39Ar	40Ar*	Age (Ma)
700	18	2.8e-15	7.2655	0.0e+0	9.7299	0.0112	0.050	0.00965	0.545	25.7 ± 1.2
800	18	2.7e-15	6.7439	0.0e+0	0.6071	0.0096	0.81	0.01969	0.579	25.3 ± 1.2
880	18	3.8e-15	10.3145	0.0e+0	1.6506	0.0222	0.30	0.02868	0.363	24.3 ± 1.2
960	18	3.8e-15	7.6726	5.3e-3	5.7672	0.0123	0.085	0.04105	0.525	26.1 ± 0.9
1040	18	3.5e-14	5.9267	9.1e-3	4.9489	0.0056	0.099	0.18885	0.720	27.6 ± 0.1
1120	18	1.2e-13	5.3018	8.6e-3	5.6047	0.0038	0.087	0.76045	0.787	27.0 ± 0.1
1200	18	4.2e-14	5.2318	8.2e-3	5.7759	0.0036	0.085	0.95838	0.797	27.0 ± 0.1
1260	18	4.8e-15	5.2648	7.4e-3	7.3047	0.0046	0.067	0.98116	0.743	25.3 ± 0.5
1330	18	1.1e-15	7.6187	1.7e-2	20.0921	0.0114	0.024	0.98471	0.558	27.5 ± 3.3
1400	18	3.8e-15	6.1862	7.7e-3	23.2888	0.0064	0.021	1.00000	0.697	27.9 ± 0.8

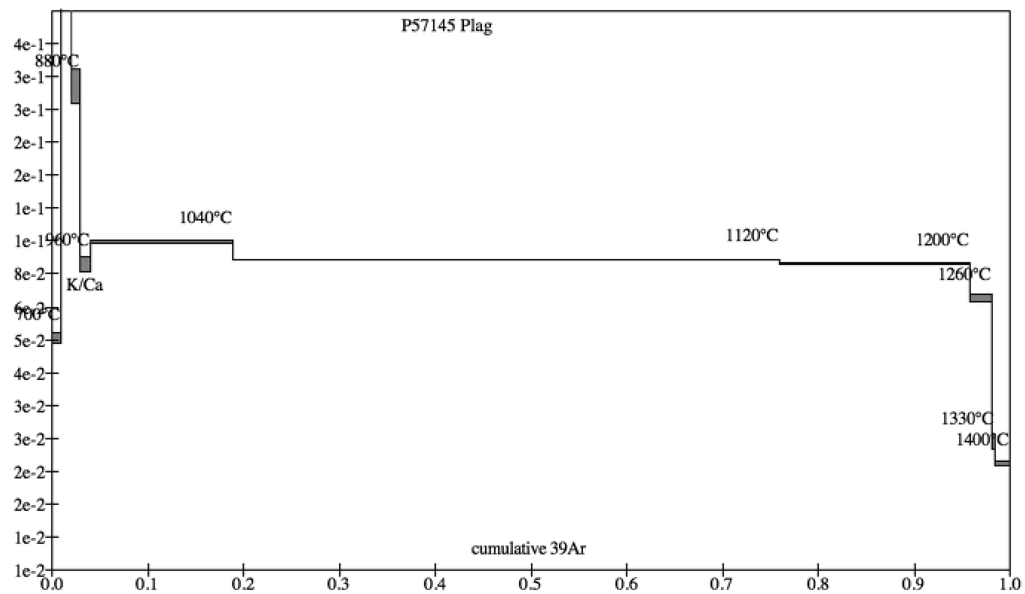
Total fusion age, TFA= 27.03 ± 0.07 Ma (including J)
Weighted mean plateau age, WMPA= 27.03 ± 0.07 Ma (including J)
Inverse isochron age =25.80 ± 0.33 Ma. (MSWD =0.05; 40Ar/36Ar=346.2 ± 2.7)
Steps used: 1120, 1200, (6–7/10 or 77% ∑ 39Ar)

SB 63–5: P57145 plagioclase. Estimated Age = 27.03 ± 0.14
Comment: This gave a reasonably flat spectrum though most of the gas came out over a fairly narrow temperature range - kind of degassed more like a hornblende The K/Ca ratio is pretty high for plagioclase. In any case, nothing looks wrong with this age.





P57145 Plag
MSWD = 0.05 (< 3.83)
Age =25.80 ± 0.33 Ma
(±1 sigma shown)
Atm.
40/36=346.2 ± 12.3
36/40
39/40
880°C
960°C
700°C
1330°C
800°C
1400°C
1040°C
1260°C
1120°C
1200°C

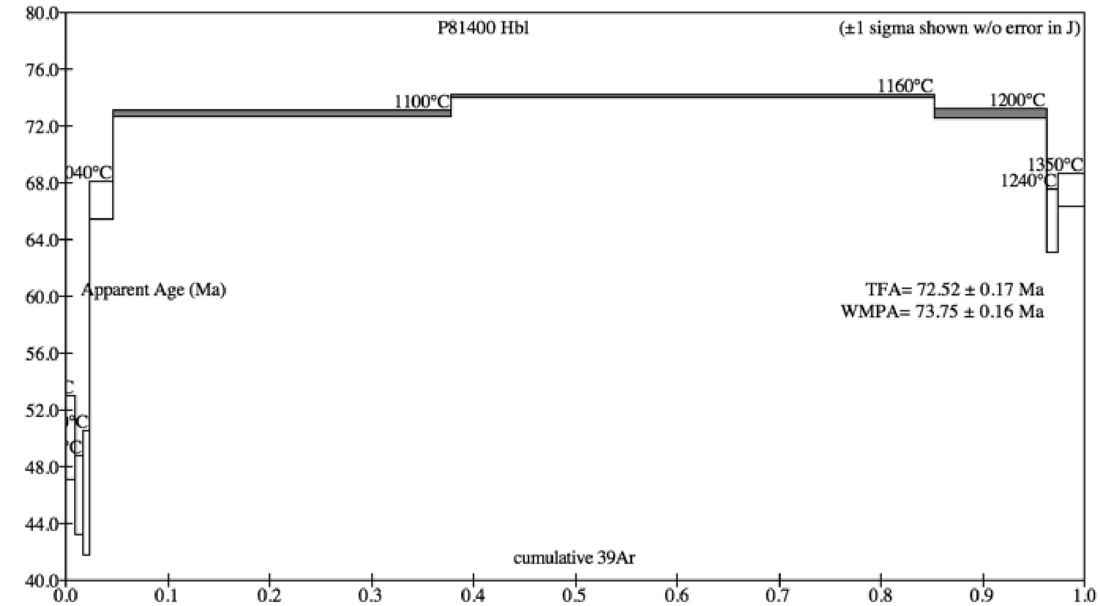


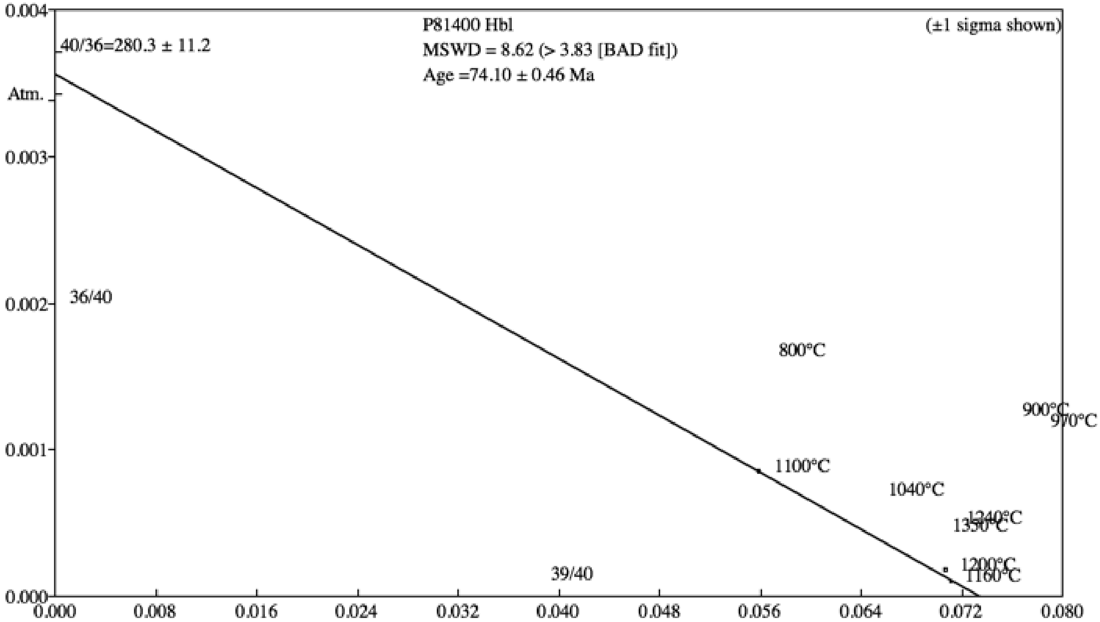
P57145 Plag
K/Ca
cumulative 39Ar
880°C
960°C
700°C
1040°C
1120°C
1200°C
1260°C
1330°C
1400°C

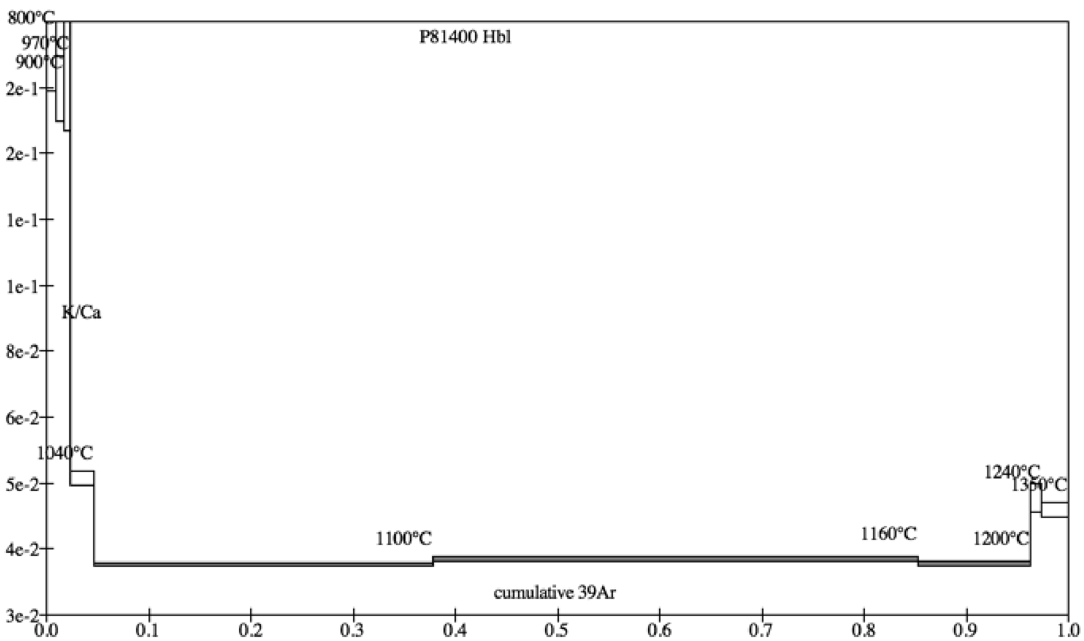
SB65-7. P81400 hornblende

4.4 mg Hbl				**J =**	**0.003078467**		**±**		**4.6177E-06**		
Exp#	Trf	Dwell	40Ar*	39K	%rad	K/Ca	Age(Ma)	±Age	40/39m	37/39m	36/39m
3B8834	800	14	0.028	0.003	51.49	0.23	50.087	3.007	17.7275	2.1090	0.0297
3B8835	900	14	0.026	0.003	63.43	0.20	46.005	2.878	13.1994	2.4543	0.0170
3B8836	970	14	0.016	0.002	65.62	0.21	46.167	4.513	12.8061	2.2948	0.0155
3B8837	1040	14	0.095	0.008	79.58	0.05	66.798	1.344	15.2678	9.5772	0.0131
3B8838	1100	14	1.506	0.112	74.84	0.04	72.886	0.267	17.6924	12.8867	0.0185
3B8839	1160	14	2.192	0.161	96.87	0.04	74.131	0.145	13.9108	12.6170	0.0049
3B8840	1200	14	0.498	0.037	94.65	0.04	72.888	0.392	13.9907	12.8625	0.0060
3B8841	1240	14	0.047	0.004	85.26	0.05	65.338	2.343	13.9258	10.2214	0.0097
3B8842	1350	13	0.108	0.009	86.79	0.05	67.545	1.212	14.1449	10.6645	0.0092

SB65-7. P81400 hornblende. Quote age as 74.1 ± 0.15 Ma,
Comment: Best steps yield nearly concordant "plateau" for ~90% of gas released. using highest precision, highest radiogenic yield step at top of "central hump.




P81400 Hbl
MSWD = 8.62 (> 3.83 [BAD fit])
Age =74.10 ± 0.46 Ma
(±1 sigma shown)
40/36=280.3 ± 11.2
Atm.
36/40
39/40
800°C
900°C
970°C
1100°C
1040°C
1240°C
1350°C
1200°C
1160°C
0.004
0.003
0.002
0.001
0.000
0.000
0.008
0.016
0.024
0.032
0.040
0.048
0.056
0.064
0.072
0.080


P81400 Hbl
K/Ca
cumulative 39Ar
800°C
970°C
900°C
1040°C
1100°C
1160°C
1200°C
1240°C
1350°C
2e-1
2e-1
1e-1
1e-1
8e-2
6e-2
5e-2
4e-2
3e-2
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

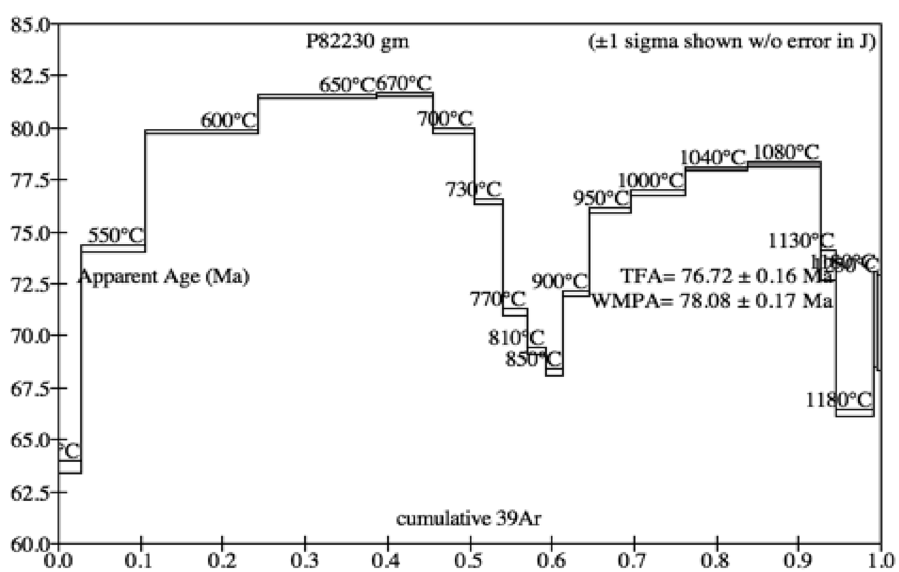
SB66-3. P82230 groundmass

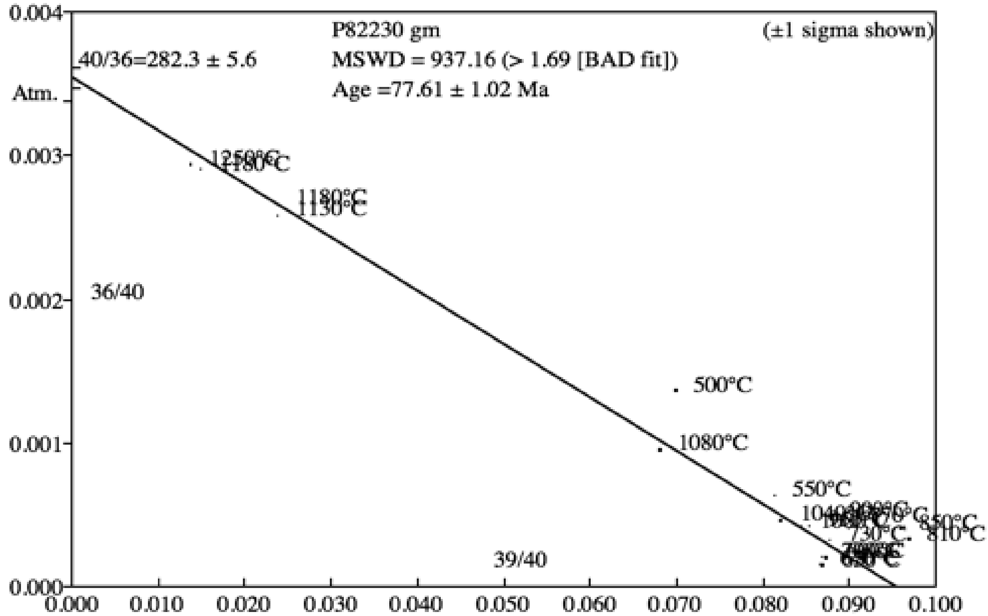
J=0.0041977

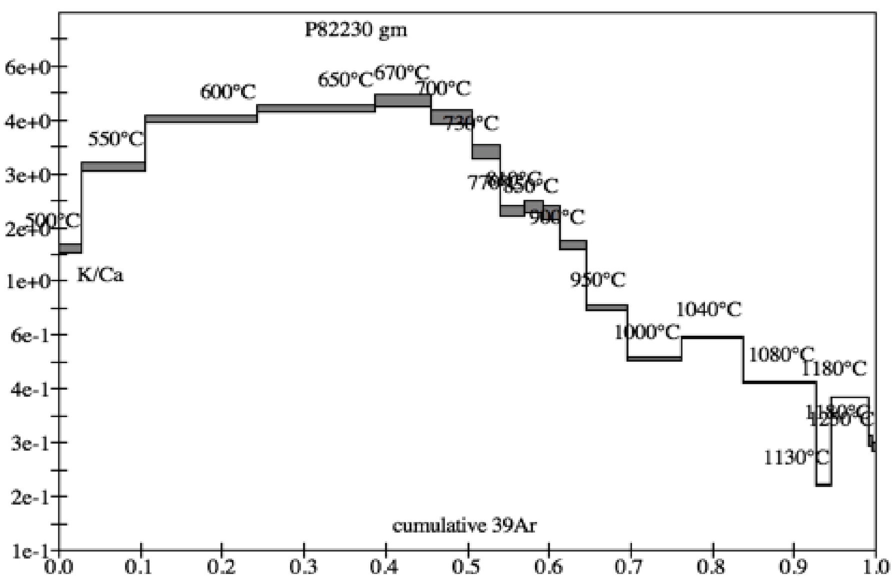
T	t	40(mol)	40/39	38/39	37/39	36/39	K/Ca	∑ 39Ar	40Ar*	Age (Ma)
500	14	6.1e-14	14.3140	7.3e-4	0.3693	0.0195	1.3	0.02708	0.598	63.7 ± 0.3
550	14	1.5e-13	12.2990	0.0e+0	0.1848	0.0078	2.7	0.10610	0.813	74.2 ± 0.2
600	14	2.5e-13	11.4536	0.0e+0	0.1227	0.0023	4.0	0.24338	0.941	79.8 ± 0.2
650	14	2.6e-13	11.5132	0.0e+0	0.1116	0.0017	4.4	0.38600	0.956	81.5 ± 0.2
670	14	1.3e-13	11.5429	0.0e+0	0.1045	0.0018	4.7	0.45573	0.955	81.6 ± 0.2
700	14	9.2e-14	11.5022	0.0e+0	0.1207	0.0024	4.1	0.50595	0.938	79.9 ± 0.2
730	14	6.3e-14	11.4007	0.0e+0	0.1619	0.0037	3.0	0.54091	0.905	76.5 ± 0.2
770	14	4.9e-14	11.0845	0.0e+0	0.2687	0.0051	1.8	0.56886	0.864	71.1 ± 0.2
810	14	3.8e-14	10.3264	0.0e+0	0.2591	0.0034	1.9	0.59199	0.903	69.3 ± 0.2
850	14	3.6e-14	10.4269	0.0e+0	0.2746	0.0042	1.8	0.61392	0.881	68.3 ± 0.2
900	14	5.5e-14	11.3743	0.0e+0	0.3605	0.0057	1.4	0.64466	0.853	72.0 ± 0.2
950	14	9.4e-14	11.7193	0.0e+0	0.6199	0.0050	0.79	0.69506	0.875	76.0 ± 0.2
1000	14	1.3e-13	11.8390	0.0e+0	0.9593	0.0050	0.51	0.76229	0.876	76.9 ± 0.2
1040	14	1.5e-13	12.1852	0.0e+0	0.7952	0.0056	0.62	0.83834	0.864	78.0 ± 0.2
1080	14	2.0e-13	14.6980	0.0e+0	1.1778	0.0140	0.42	0.92621	0.718	78.2 ± 0.2
1130	14	1.3e-13	42.0782	8.5e-4	2.8210	0.1089	0.17	0.94517	0.235	73.4 ± 0.7
1180	14	3.1e-13	41.9619	8.7e-4	1.3238	0.1118	0.37	0.99128	0.213	66.3 ± 0.2
1180	14	4.5e-14	67.2239	4.4e-3	1.9251	0.1952	0.25	0.99550	0.142	70.8 ± 2.3
1250	14	5.2e-14	72.4687	3.3e-3	2.0266	0.2130	0.24	1.00000	0.131	70.7 ± 2.3

Total fusion age, TFA= 76.72 ± 0.16 Ma (including J)
Weighted mean plateau age, WMPA= 78.08 ± 0.17 Ma (including J)
Inverse isochron age =77.61 ± 1.02 Ma. (MSWD =937.16; 40Ar/36Ar=282.3 ± 5.6)
Steps used: 1040, 1080, (14–15/19 or 16% ∑ 39Ar)

SB66-3. P82230 groundmass. Interpreted age >78Ma.
Comment: Low T domain of high K/Ca – probably glass plus clays after glass – likely combined effects of argon loss and reactor induced recoil. Higher T domain of more reasonable K/Ca (0.4-0.8) = groundmass feldspar – climbs to ~78 Ma – which is likely good (minimum) age for the material.




P82230 gm
(±1 sigma shown)
40/36=282.3 ± 5.6
MSWD = 937.16 (> 1.69 [BAD fit])
Age =77.61 ± 1.02 Ma
Atm.
36/40
39/40
500°C
1080°C
550°C
730°C
810°C
850°C
0.000
0.001
0.002
0.003
0.004
0.010
0.020
0.030
0.040
0.050
0.060
0.070
0.080
0.090
0.100


P82230 gm
500°C
550°C
600°C
650°C
670°C
700°C
730°C
850°C
900°C
950°C
1000°C
1040°C
1080°C
1180°C
1130°C
K/Ca
cumulative 39Ar
6e+0
4e+0
3e+0
2e+0
1e+0
6e-1
4e-1
3e-1
2e-1
1e-1
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

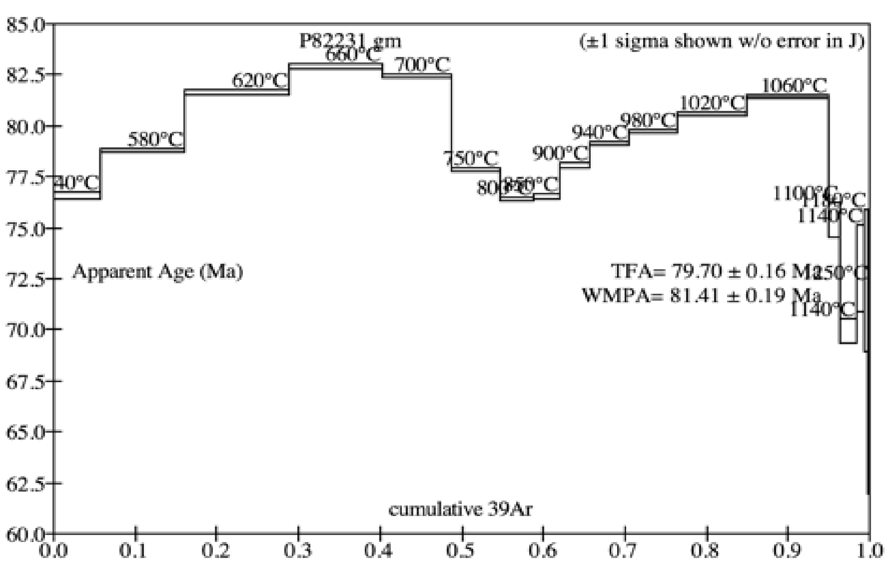
SB66-4. P82231 groundmass

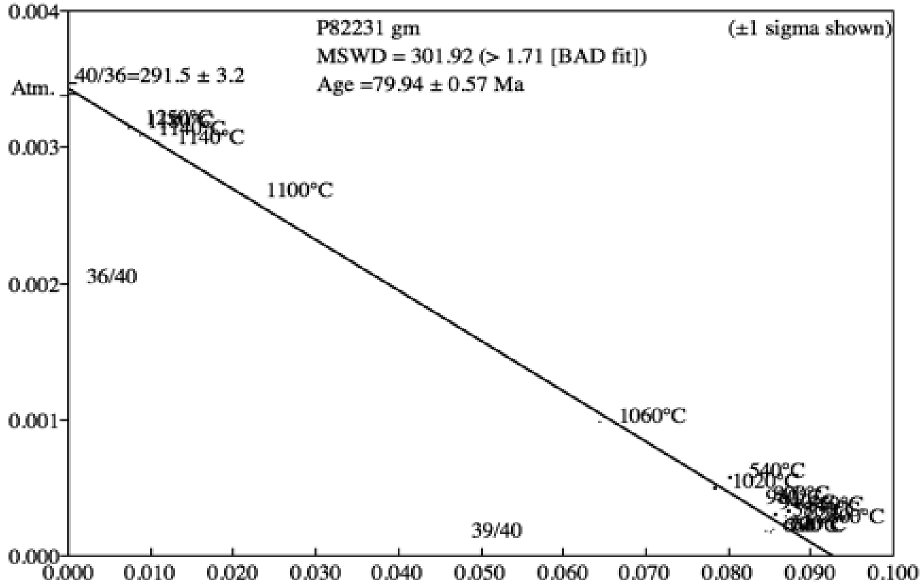
J=0.0041990

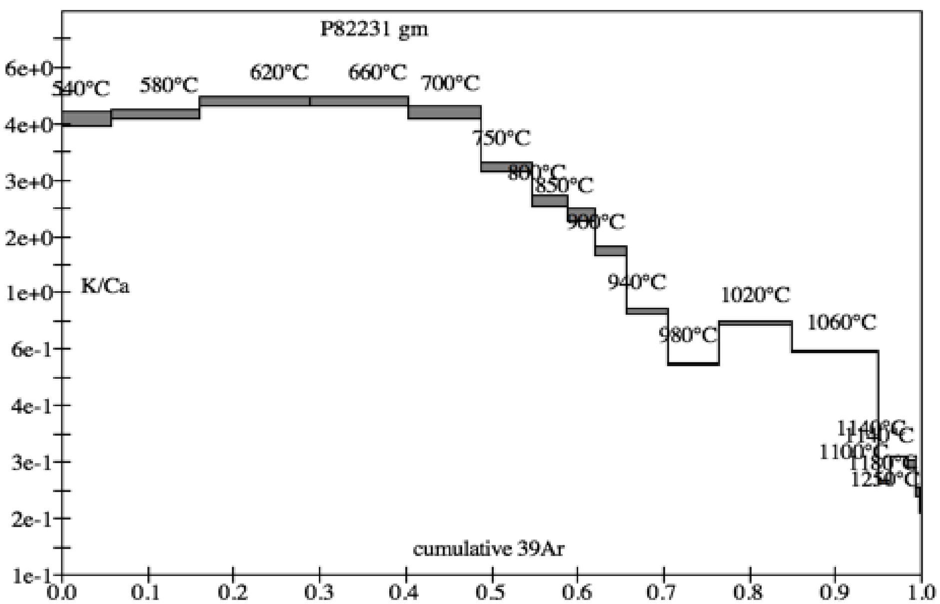
T	t	40(mol)	40/39	38/39	37/39	36/39	K/Ca	∑ 39Ar	40Ar*	Age (Ma)
540	14	1.1e-13	12.4557	0.0e+0	0.1189	0.0072	4.1	0.05631	0.829	76.6 ± 0.2
580	14	1.9e-13	11.6825	0.0e+0	0.1144	0.0035	4.3	0.16074	0.910	78.8 ± 0.2
620	14	2.3e-13	11.7039	0.0e+0	0.1029	0.0023	4.8	0.28749	0.942	81.6 ± 0.2
660	14	2.1e-13	11.8352	0.0e+0	0.1031	0.0022	4.8	0.40217	0.946	82.9 ± 0.2
700	14	1.5e-13	11.7461	0.0e+0	0.1125	0.0021	4.4	0.48643	0.948	82.5 ± 0.2
750	14	1.1e-13	11.5004	0.0e+0	0.1764	0.0034	2.8	0.54777	0.913	77.9 ± 0.2
800	14	7.0e-14	11.1138	0.0e+0	0.2331	0.0027	2.1	0.58860	0.927	76.4 ± 0.2
850	14	5.7e-14	11.4507	0.0e+0	0.2602	0.0038	1.9	0.62075	0.902	76.6 ± 0.2
900	14	6.8e-14	11.9994	0.0e+0	0.3514	0.0050	1.4	0.65757	0.878	78.1 ± 0.2
940	14	8.8e-14	11.9043	0.0e+0	0.5720	0.0042	0.86	0.70541	0.897	79.1 ± 0.2
980	14	1.1e-13	12.1516	0.0e+0	0.8814	0.0047	0.56	0.76487	0.885	79.7 ± 0.2
1020	14	1.7e-13	12.7600	0.0e+0	0.6336	0.0064	0.77	0.84918	0.852	80.6 ± 0.2
1060	14	2.4e-13	15.5184	0.0e+0	0.7962	0.0153	0.62	0.94873	0.708	81.4 ± 0.2
1100	14	1.1e-13	45.8555	2.1e-3	2.3067	0.1208	0.21	0.96433	0.222	75.4 ± 0.9
1140	14	2.6e-13	90.8312	9.1e-3	1.8748	0.2755	0.26	0.98306	0.104	69.9 ± 0.6
1140	14	1.6e-13	113.8003	5.9e-3	1.9981	0.3518	0.25	0.99231	0.086	73.0 ± 2.1
1180	14	9.6e-14	137.8288	1.2e-2	2.4916	0.4334	0.20	0.99686	0.071	72.4 ± 3.5
1250	14	6.9e-14	141.9953	1.1e-2	2.8458	0.4500	0.17	1.00000	0.064	67.1 ± 5.2

Total fusion age, TFA= 79.70 ± 0.16 Ma (including J)
Weighted mean plateau age, WMPA= 81.41 ± 0.19 Ma (including J)
Inverse isochron age =79.94 ± 0.57 Ma. (MSWD =301.92; 40Ar/36Ar=291.5 ± 3.2)
Steps used: 1060, (13–13/18 or 10% ∑ 39Ar)

SB66-4. P82231 groundmass. Minimum age 81Ma
Comment: see SB66-3 above.




P82231 gm
(±1 sigma shown)
MSWD = 301.92 (> 1.71 [BAD fit])
Age =79.94 ± 0.57 Ma
40/36=291.5 ± 3.2
Atm.
36/40
39/40
1100°C
1140°C
1060°C
540°C
1020°C
0.004
0.003
0.002
0.001
0.000
0.000
0.010
0.020
0.030
0.040
0.050
0.060
0.070
0.080
0.090
0.100


P82231 gm
540°C
580°C
620°C
660°C
700°C
750°C
800°C
850°C
900°C
940°C
980°C
1020°C
1060°C
1140°C
1100°C
1250°C
K/Ca
cumulative 39Ar
6e+0
4e+0
3e+0
2e+0
1e+0
6e-1
4e-1
3e-1
2e-1
1e-1
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

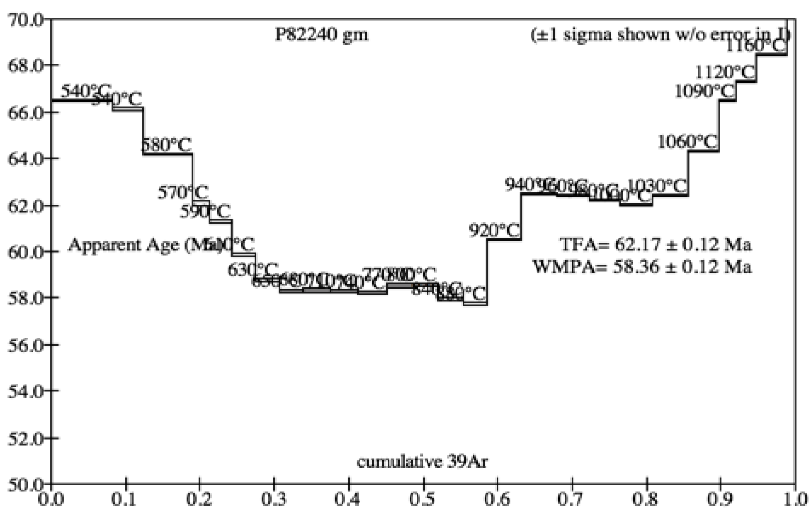
SB66-5. P82240 groundmass

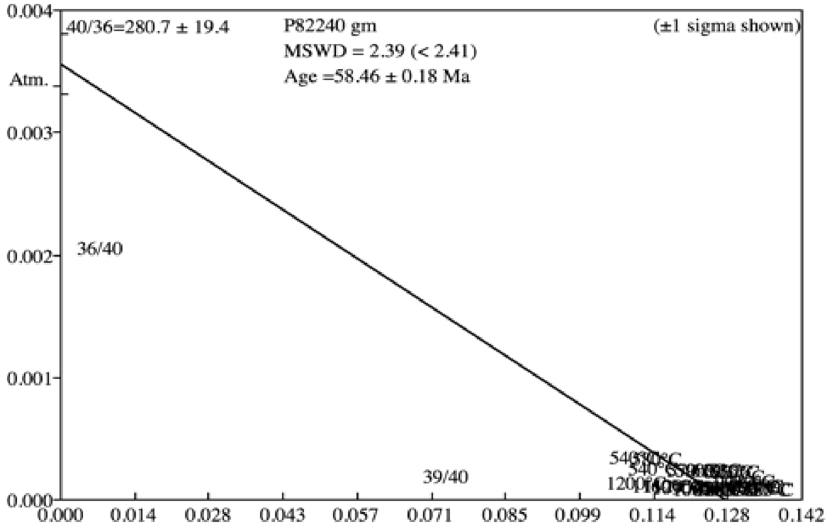
J=0.0041997

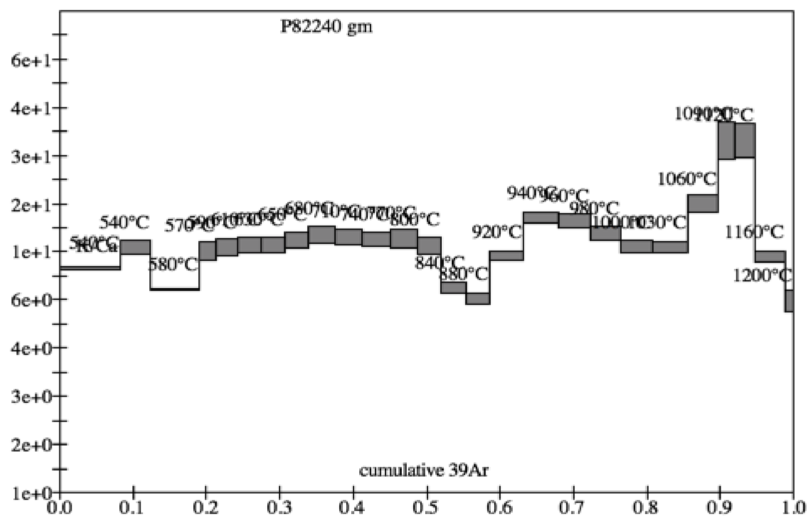
T	t	40(mol)	40/39	38/39	37/39	36/39	K/Ca	∑ 39Ar	40Ar*	Age (Ma)
540	14	4.9e-13	9.7862	0.0e+0	0.0574	0.0029	8.5	0.08151	0.914	66.5 ± 0.1
540	14	2.5e-13	9.4771	0.0e+0	0.0470	0.0020	10	0.12320	0.938	66.1 ± 0.1
580	14	3.9e-13	9.3965	0.0e+0	0.0707	0.0026	6.9	0.19090	0.917	64.2 ± 0.1
570	14	1.2e-13	8.8457	0.0e+0	0.0489	0.0017	10	0.21343	0.942	62.1 ± 0.2
590	14	1.6e-13	8.7217	0.0e+0	0.0469	0.0017	10	0.24238	0.944	61.3 ± 0.1
610	14	1.7e-13	8.5088	0.0e+0	0.0460	0.0016	11	0.27430	0.944	59.9 ± 0.1
630	14	1.7e-13	8.3366	0.0e+0	0.0460	0.0015	11	0.30667	0.946	58.8 ± 0.1
650	14	1.6e-13	8.2473	0.0e+0	0.0441	0.0014	11	0.33826	0.948	58.3 ± 0.1
680	14	1.9e-13	8.1780	0.0e+0	0.0414	0.0012	12	0.37475	0.957	58.3 ± 0.1
710	14	1.9e-13	8.0587	0.0e+0	0.0426	0.0008	12	0.41277	0.970	58.3 ± 0.1
740	14	1.9e-13	7.9577	0.0e+0	0.0437	0.0005	11	0.45069	0.982	58.2 ± 0.1
770	14	1.8e-13	7.9832	0.0e+0	0.0434	0.0004	11	0.48632	0.984	58.5 ± 0.1
800	14	1.6e-13	8.0191	0.0e+0	0.0461	0.0005	11	0.51912	0.980	58.6 ± 0.1
840	14	1.7e-13	7.8747	0.0e+0	0.0692	0.0003	7.1	0.55419	0.987	58.0 ± 0.1
880	14	1.5e-13	7.8252	0.0e+0	0.0774	0.0003	6.3	0.58527	0.990	57.7 ± 0.1
920	14	2.4e-13	8.2236	0.0e+0	0.0514	0.0004	9.5	0.63158	0.987	60.5 ± 0.1
940	14	2.5e-13	8.5106	0.0e+0	0.0356	0.0004	14	0.67913	0.986	62.5 ± 0.1
960	14	2.3e-13	8.4970	0.0e+0	0.0366	0.0004	13	0.72341	0.986	62.4 ± 0.1
980	14	2.2e-13	8.4527	0.0e+0	0.0412	0.0003	12	0.76529	0.988	62.2 ± 0.1
1000	14	2.2e-13	8.4254	0.0e+0	0.0470	0.0003	10	0.80715	0.988	62.0 ± 0.1
1030	14	2.5e-13	8.5000	0.0e+0	0.0471	0.0004	10	0.85476	0.987	62.4 ± 0.1
1060	14	2.3e-13	8.7543	0.0e+0	0.0310	0.0004	16	0.89626	0.987	64.3 ± 0.1
1090	14	1.3e-13	9.0886	0.0e+0	0.0166	0.0005	29	0.91963	0.984	66.5 ± 0.1
1120	14	1.6e-13	9.2244	0.0e+0	0.0168	0.0006	29	0.94673	0.982	67.3 ± 0.1
1160	14	2.4e-13	9.4035	0.0e+0	0.0517	0.0007	9.5	0.98768	0.979	68.4 ± 0.1
1200	14	7.5e-14	9.8504	0.0e+0	0.0789	0.0009	6.2	1.00000	0.973	71.2 ± 0.2

Total fusion age, TFA= 62.17 ± 0.12 Ma (including J)
Weighted mean plateau age, WMPA= 58.36 ± 0.12 Ma (including J)
Inverse isochron age =58.46 ± 0.18 Ma. (MSWD =2.39; 40Ar/36Ar=280.7 ± 19.4)
Steps used: 650, 680, 710, 740, 770, 800, (8–13/26 or 21% ∑ 39Ar)

SB66-5. P82240 groundmass. Minimum age 58 Ma
Comment: see SB66-3 above




40/36=280.7 ± 19.4
P82240 gm
MSWD = 2.39 (< 2.41)
Age =58.46 ± 0.18 Ma
(±1 sigma shown)
Atm.
36/40
39/40
0.004
0.003
0.002
0.001
0.000
0.000
0.014
0.028
0.043
0.057
0.071
0.085
0.099
0.114
0.128
0.142


P82240 gm
K/Ca
540°C
580°C
840°C
880°C
920°C
940°C
960°C
980°C
1060°C
1160°C
1200°C
cumulative 39Ar
6e+1
4e+1
3e+1
2e+1
1e+1
6e+0
4e+0
3e+0
2e+0
1e+0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

SB66-25. P82218Bi plagioclase

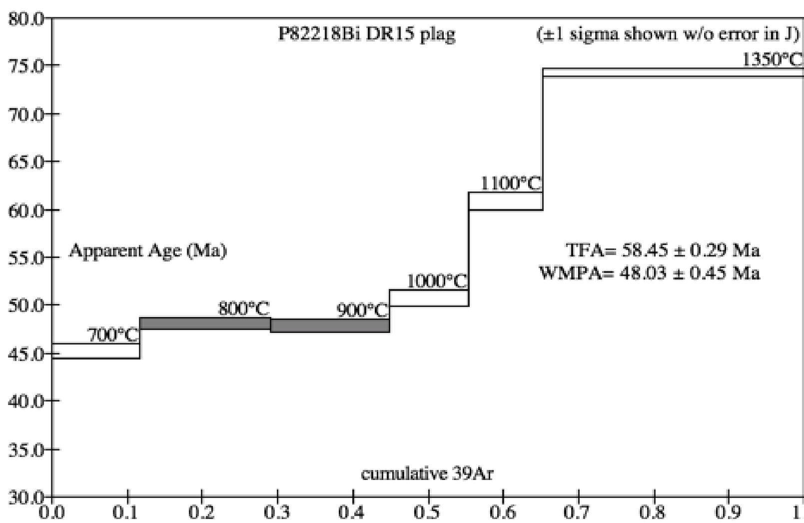
Labview

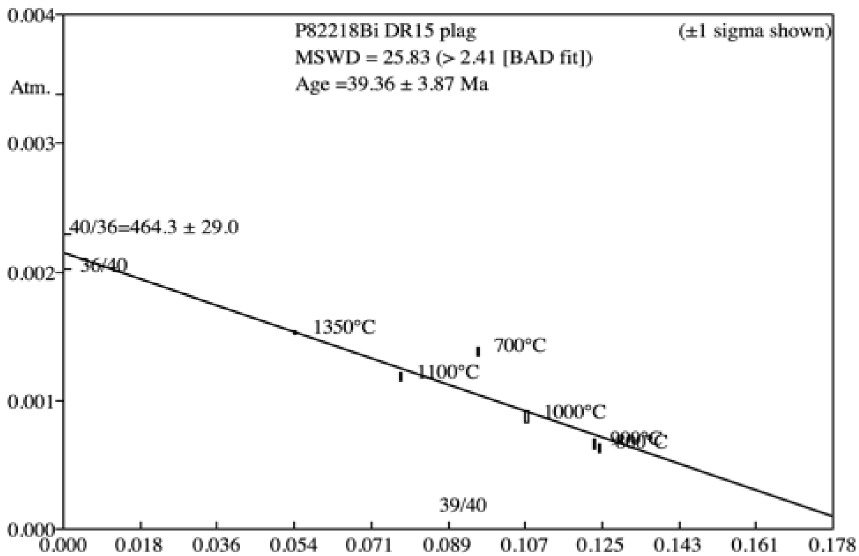
SB66-25P82218Bi DR15 7.8 mg plag J = 0.004121103 ± 0.00000826 Summary

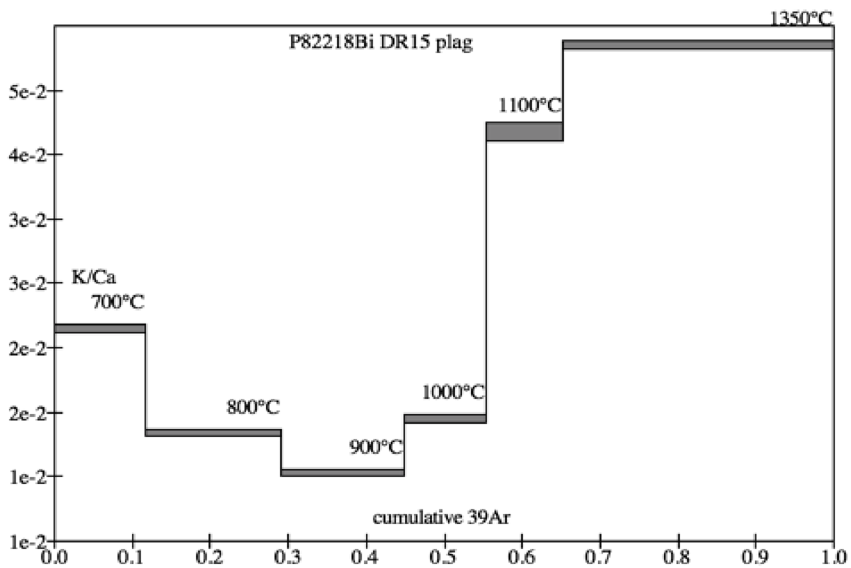
Exp#	Trf	Dwell	40Ar*	39K	%rad	K/Ca	Age(Ma)	±Age	40/39m	37/39m	36/39m
4B2518	700	16	0.271	0.044	59.22	0.02	45.253	0.812	10.2021	22.5539	0.0201
4B2519	800	16	0.426	0.065	81.41	0.01	48.105	0.597	7.8259	32.4786	0.0136
4B2520	900	16	0.385	0.059	80.43	0.01	47.929	0.690	7.8574	37.3095	0.0152
4B2521	1000	16	0.273	0.039	74.31	0.02	50.723	0.899	9.0604	30.8704	0.0162
4B2522	1100	16	0.312	0.037	65.11	0.04	60.881	0.960	12.6663	11.2624	0.0180
4B2523	1350	16	1.355	0.133	54.84	0.06	74.363	0.465	18.4836	8.2765	0.0305

Total fusion age, TFA= 58.45 ± 0.29 Ma (including J)
Weighted mean plateau age, WMPA= 48.03 ± 0.45 Ma (including J)
Inverse isochron age =39.36 ± 3.87 Ma. (MSWD =25.83; 40Ar/36Ar=464.3 ± 29.0)
Steps used: 800, 900, (2–3/6 or 33% ∑ 39Ar)

SB66-25. P82218Bi plagioclase. Interpreted age c. 48 Ma?
Comment: Climbing spectrum with ages that start at 45 Ma, fairly flat over first half, and then climb to 75 Ma. mini flat near beginning at ~ 48 Ma, but only 2 steps. 33% of gas. K/Cas are .013 to .05 - a little higher than most of the plags we have analyzed, but reasonable for an OIB plag. Radiogenic yields are high. Suspect there is an excess argon issue in this plag, but no good isochrons. WMPA (2 steps, 33% of gas = 48.0 ± 0.9 Ma. Isochron Age none. Interpreted age =48 Ma ??? Really not sure.




P82218Bi DR15 plag
(±1 sigma shown)
MSWD = 25.83 (> 2.41 [BAD fit])
Age =39.36 ± 3.87 Ma
Atm.
40/36=464.3 ± 29.0
36/40
1350°C
700°C
1100°C
1000°C
900°C
800°C
39/40
0.004
0.003
0.002
0.001
0.000
0.000
0.018
0.036
0.054
0.071
0.089
0.107
0.125
0.143
0.161
0.178


P82218Bi DR15 plag
1350°C
1100°C
K/Ca
700°C
800°C
900°C
1000°C
cumulative 39Ar
5e-2
4e-2
3e-2
3e-2
2e-2
2e-2
1e-2
1e-2
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

SB66-26. P82218C groundmass

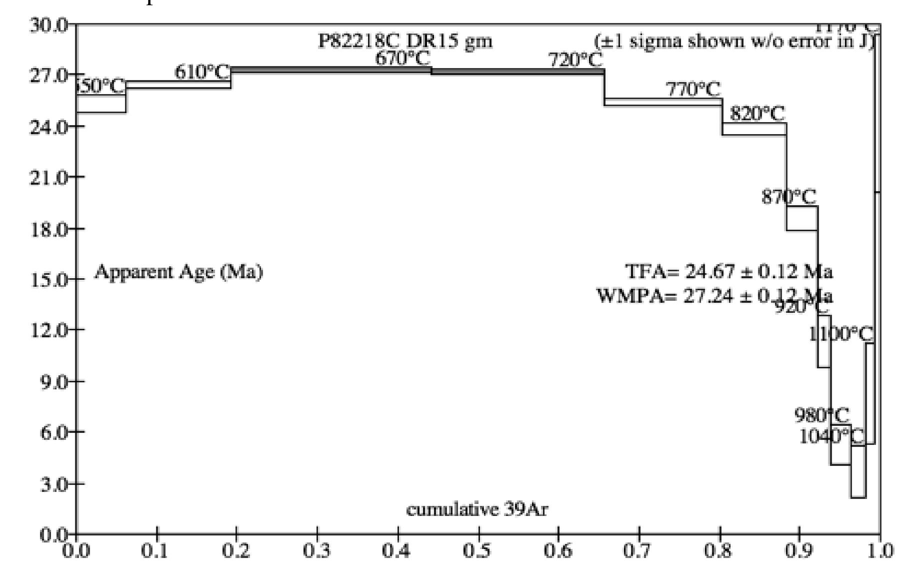
Labview

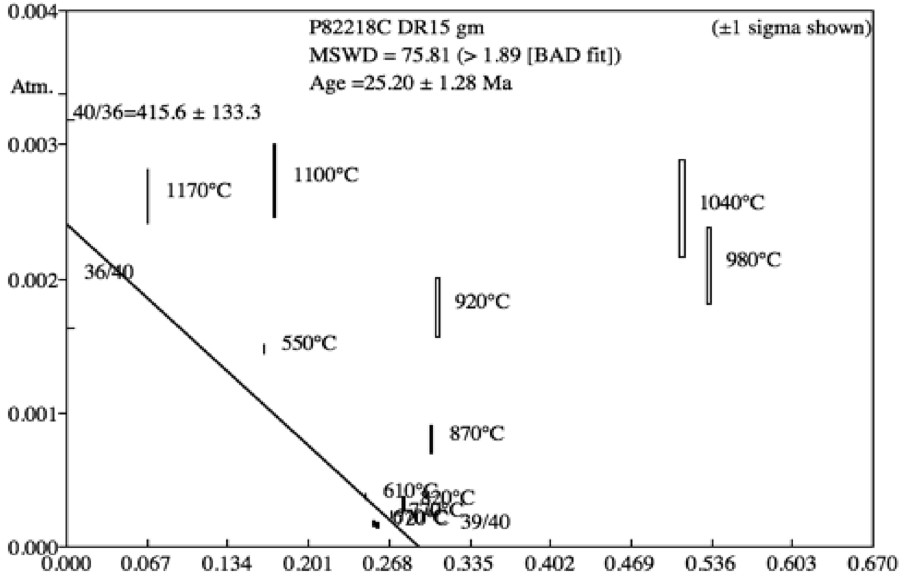
SB66-26P82218C DR15   24.9 mg gm   J =   0.004113299   ±   0.00000825   Summary

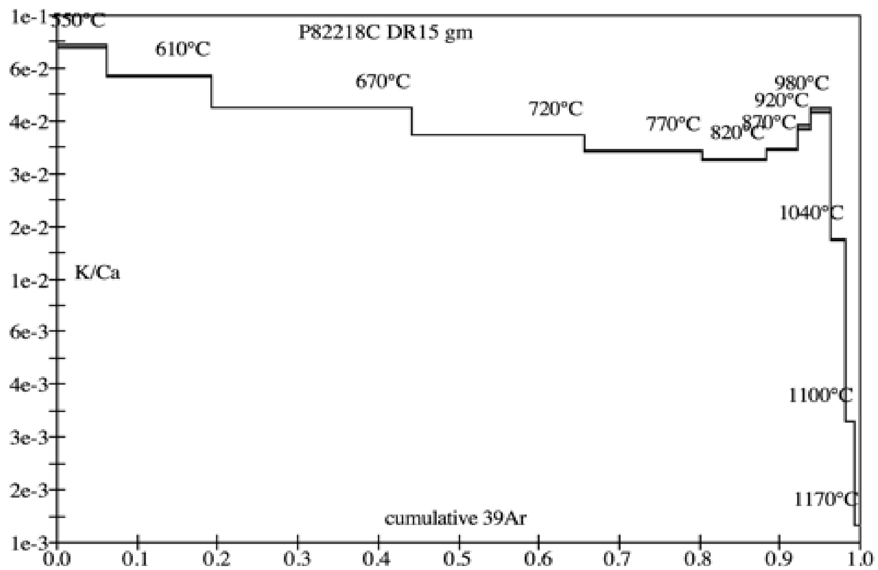
Exp#	Trf	Dwell	40Ar*	39K	%rad	K/Ca	Age(Ma)	±Age	40/39m	37/39m	36/39m
4B2312	550	14	0.220	0.064	56.31	0.08	25.276	0.534	6.0574	6.4577	0.0107
4B2313	610	14	0.499	0.139	89.07	0.06	26.407	0.228	3.9954	8.3446	0.0037
4B2314	670	14	0.968	0.261	94.71	0.04	27.317	0.145	3.8790	11.0017	0.0036
4B2315	720	14	0.830	0.225	95.19	0.03	27.156	0.157	3.8268	13.9194	0.0044
4B2316	770	14	0.524	0.152	93.06	0.03	25.403	0.242	3.6533	15.9382	0.0051
4B2317	820	14	0.272	0.084	90.36	0.03	23.840	0.385	3.5255	17.1327	0.0057
4B2318	870	14	0.101	0.040	76.26	0.03	18.578	0.746	3.2548	15.7099	0.0068
4B2319	920	14	0.028	0.018	47.26	0.04	11.350	1.550	3.2102	12.9821	0.0092
4B2320	980	14	0.018	0.025	37.98	0.04	5.274	1.155	1.8561	11.2000	0.0069
4B2321	1040	14	0.010	0.020	25.28	0.01	3.670	1.506	1.9006	33.9225	0.0139
4B2322	1100	14	0.011	0.010	19.22	0.00	8.243	2.964	5.0348	149.1968	0.0538
4B2323	1170	14	0.018	0.005	22.62	0.00	24.700	4.704	10.7803	311.1201	0.1117

Total fusion age, TFA= 24.67 ± 0.12 Ma (including J)
Weighted mean plateau age, WMPA= 27.24 ± 0.12 Ma (including J)
Inverse isochron age =25.20 ± 1.28 Ma. (MSWD =75.81; 40Ar/36Ar=415.6 ± 133.3)
Steps used: 670, 720, (3–4/12 or 46% ∑ 39Ar)

SB66-26. P82218C groundmass. Preferred Age =27.2 ± 0.24 Ma (boosted uncertainty)
Comment: Pretty flattish spectrum for first 75% of gas released and then ages plummet as K/Ca ratios also plummet at the highest T (due to recoil). Fairly good and consistent K/Ca ratios for most of the spectrum (0.03 to 0.06) and also high radiogenic yields for most of the spectrum (90-95) I think I would go with the flat central part of the slightly hump-shaped spectrum, but expand the uncertainty a bit to reflect the broad hump shape and likely minor influence of both argon loss and recoil Preferred age: 27.24 ± 0.12 Ma. Could be interpreted as a minimum age, but I doubt it could me much older, given how flat the spectrum is.




P82218C DR15 gm
(±1 sigma shown)
MSWD = 75.81 (> 1.89 [BAD fit])
Age =25.20 ± 1.28 Ma
Atm.
40/36=415.6 ± 133.3
1170°C
1100°C
1040°C
980°C
36/40
920°C
550°C
870°C
610°C
820°C
770°C
720°C
39/40
0.004
0.003
0.002
0.001
0.000
0.000
0.067
0.134
0.201
0.268
0.335
0.402
0.469
0.536
0.603
0.670


P82218C DR15 gm
550°C
610°C
670°C
720°C
770°C
820°C
870°C
920°C
980°C
1040°C
1100°C
1170°C
K/Ca
cumulative 39Ar
1e-1
6e-2
4e-2
3e-2
2e-2
1e-2
6e-3
4e-3
3e-3
2e-3
1e-3
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

SB66-28. P82221 groundmass

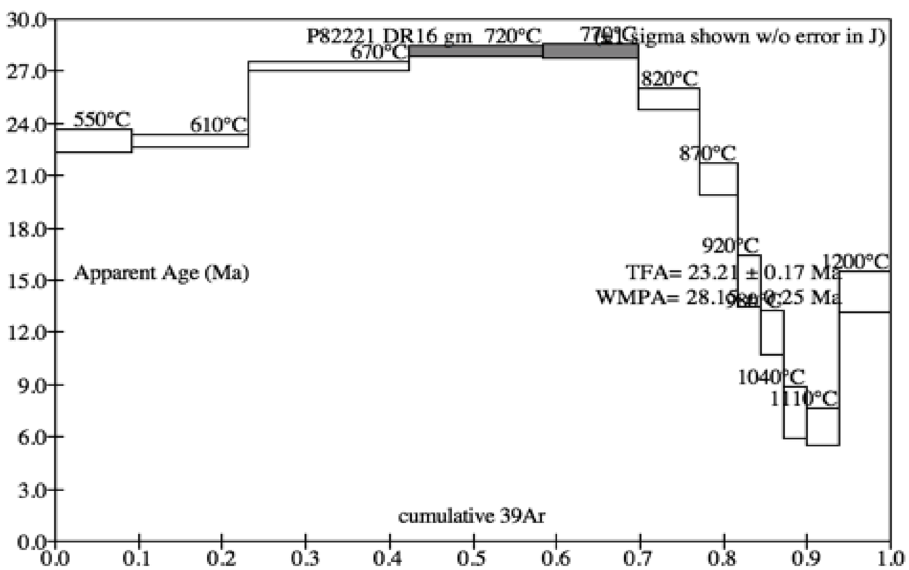
Labview

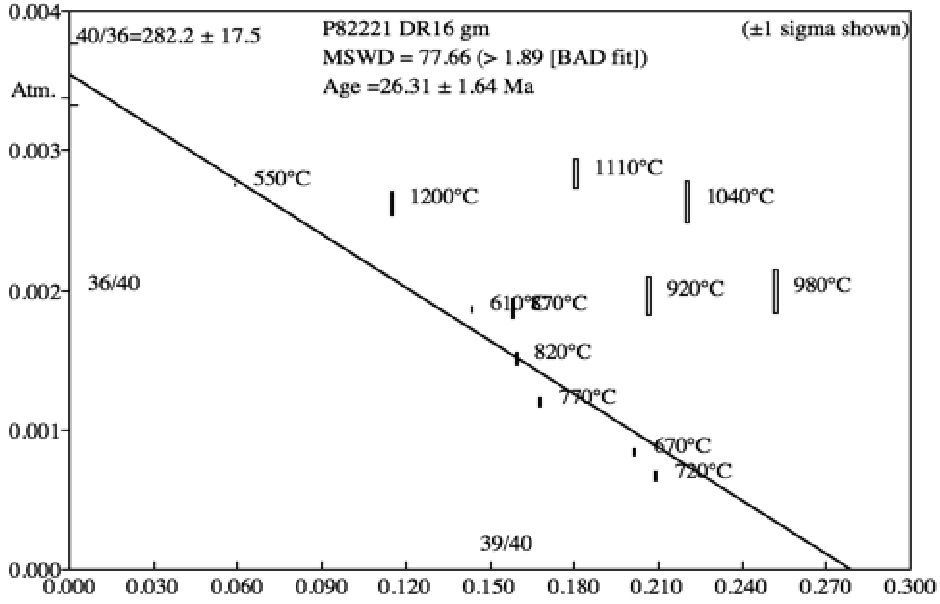
SB66-28P82221 DR16 25.2 mg gm J = 0.00409066 ± 0.0000082 Summary

Exp#	Trf	Dwell	40Ar*	39K	%rad	K/Ca	Age(Ma)	±Age	40/39m	37/39m	36/39m
4B2324	550	14	0.231	0.074	18.54	0.07	22.984	0.648	16.8028	7.1908	0.0483
4B2325	610	14	0.354	0.113	45.06	0.04	23.032	0.376	6.9040	10.9514	0.0158
4B2326	670	14	0.577	0.155	75.11	0.03	27.296	0.264	4.8960	15.3049	0.0082
4B2327	720	14	0.495	0.129	80.33	0.03	28.137	0.306	4.7045	18.8914	0.0082
4B2328	770	14	0.353	0.092	64.67	0.02	28.169	0.421	5.8397	21.0180	0.0126
4B2329	820	14	0.198	0.057	55.32	0.02	25.422	0.612	6.1540	21.3510	0.0150
4B2330	870	14	0.104	0.037	44.77	0.02	20.789	0.944	6.2183	19.8601	0.0169
4B2331	920	14	0.045	0.022	42.04	0.03	14.972	1.471	4.7741	16.9555	0.0139
4B2332	980	14	0.039	0.024	41.12	0.03	12.009	1.310	3.9178	15.3383	0.0119
4B2333	1040	14	0.021	0.021	22.22	0.02	7.417	1.469	4.4550	19.7020	0.0170
4B2334	1110	14	0.026	0.029	16.08	0.01	6.567	1.081	5.1486	81.8440	0.0366
4B2335	1200	14	0.085	0.043	22.35	0.00	14.302	1.148	7.5131	156.6131	0.0618

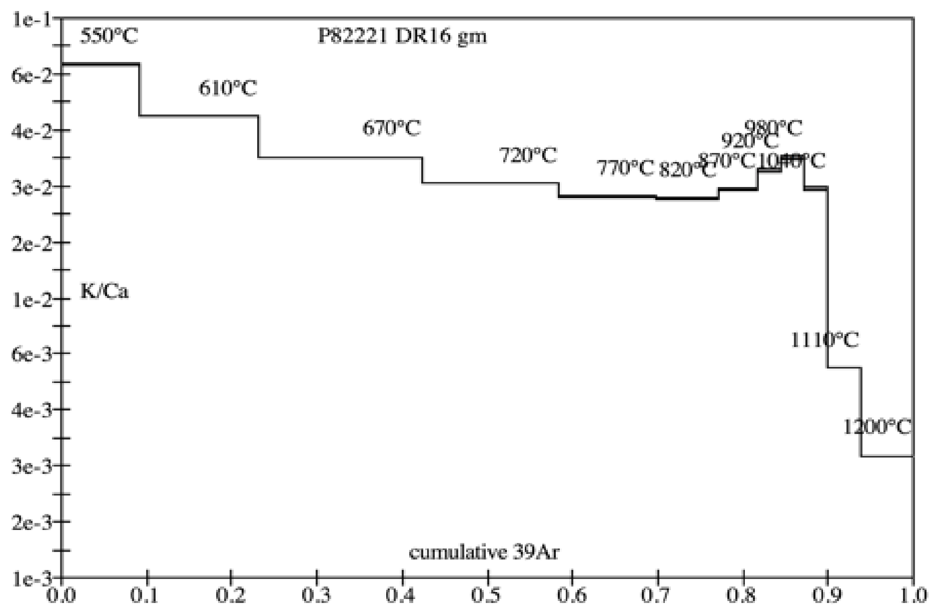
Total fusion age, TFA= 23.21 ± 0.17 Ma (including J)
Weighted mean plateau age, WMPA= 28.15 ± 0.25 Ma (including J)
Inverse isochron age =27.35 ± 1.40 Ma. (MSWD =4.63; 40Ar/36Ar=308.1 ± 42.4)
Steps used: 720, 770, (4–5/12 or 28% ∑ 39Ar)

SB66-28. P82221 groundmass. Preferred Age =28.1 ± 1.0 Ma (boosted uncertainty)
Comment: This one behaved very similar to P82218C, but not quite as flat a spectrum, a little lower K/Ca ratios and radiogenic yields. Again, a nice flat in middle of spectrum. More hump-shaped, but small flat at top is 28.15 ± 0.5 Ma. Could be interpreted as a minimum age, not sure how much older it could be.





40/36=282.2 ± 17.5
P82221 DR16 gm
MSWD = 77.66 (> 1.89 [BAD fit])
Age =26.31 ± 1.64 Ma
(±1 sigma shown)
Atm.
36/40
39/40
550°C
1200°C
1110°C
1040°C
920°C
980°C
610°C
870°C
820°C
770°C
670°C
720°C
0.004
0.003
0.002
0.001
0.000
0.000 0.030 0.060 0.090 0.120 0.150 0.180 0.210 0.240 0.270 0.300



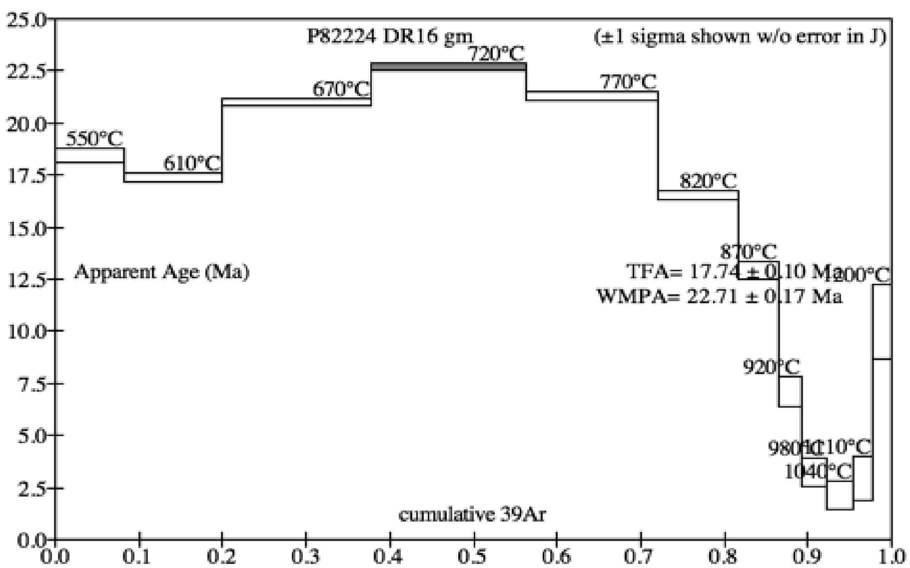
P82221 DR16 gm
K/Ca
cumulative 39Ar
550°C
610°C
670°C
720°C
770°C
820°C
870°C
920°C
980°C
1040°C
1110°C
1200°C
1e-1
6e-2
4e-2
3e-2
2e-2
1e-2
6e-3
4e-3
3e-3
2e-3
1e-3
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

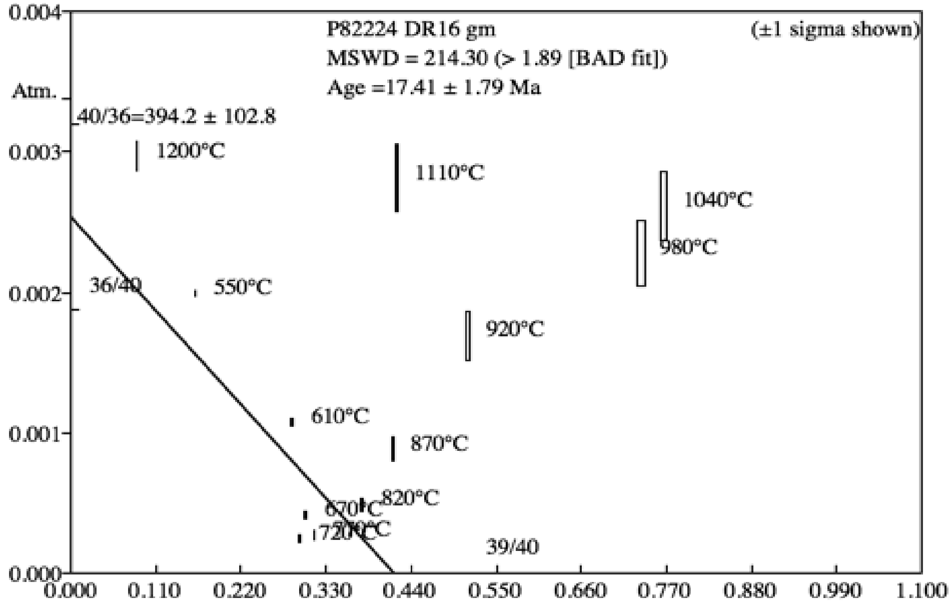
SB66-32. P82224 DR16 groundmass

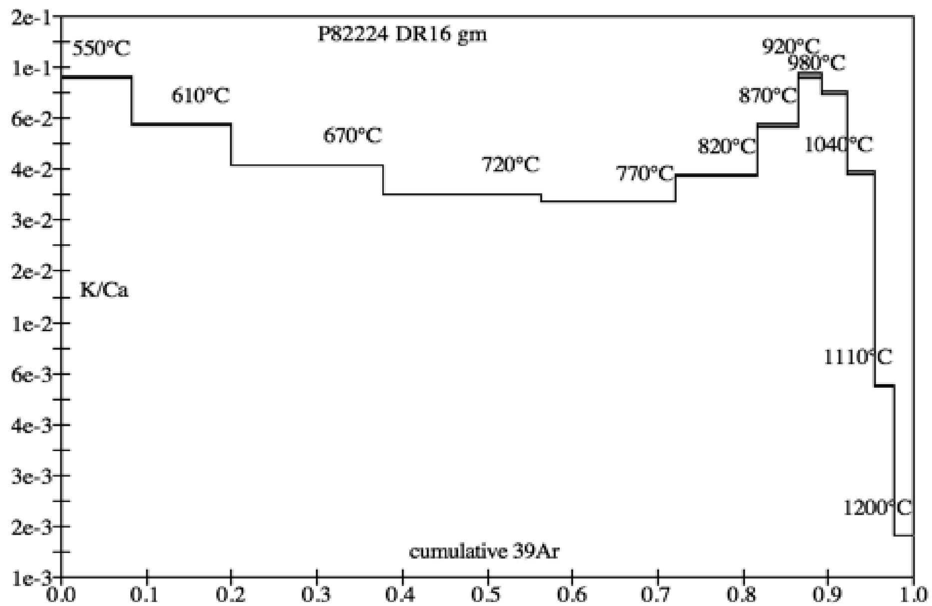
SB66-32P82224 DR16			26.4 mg gm	J =	0.004052733	±	0.00000812		Summary		
Exp#	Trf	Dwell	40Ar*	39K	%rad	K/Ca	Age(Ma)	±Age	40/39m	37/39m	36/39m
4B2336	550	14	0.229	0.090	41.04	0.09	18.442	0.357	6.1485	5.3745	0.0137
4B2337	610	14	0.308	0.129	68.30	0.06	17.393	0.218	3.4747	8.2417	0.0059
4B2338	670	14	0.567	0.197	87.70	0.04	20.977	0.159	3.2569	11.7776	0.0045
4B2339	720	14	0.635	0.203	92.58	0.03	22.712	0.170	3.3317	15.2537	0.0049
4B2340	770	14	0.503	0.172	91.96	0.03	21.272	0.209	3.1370	16.4313	0.0053
4B2341	820	14	0.241	0.106	85.61	0.04	16.537	0.244	2.6243	12.9727	0.0048
4B2342	870	14	0.093	0.052	73.81	0.06	12.933	0.426	2.3882	8.2589	0.0043
4B2343	920	14	0.030	0.031	49.96	0.09	7.108	0.726	1.9412	5.2866	0.0047
4B2344	980	14	0.014	0.033	32.63	0.08	3.232	0.690	1.3490	6.1438	0.0047
4B2345	1040	14	0.010	0.034	22.72	0.04	2.165	0.682	1.2900	12.6436	0.0068
4B2346	1110	14	0.010	0.025	16.80	0.01	2.914	1.067	2.2049	81.3733	0.0280
4B2347	1200	14	0.028	0.019	12.33	0.00	10.522	1.826	9.0159	262.4999	0.0972

Total fusion age, TFA= 17.74 ± 0.10 Ma (including J)
Weighted mean plateau age, WMPA= 22.71 ± 0.17 Ma (including J)
Inverse isochron age =17.41 ± 1.79 Ma. (MSWD =214.30; 40Ar/36Ar=394.2 ± 102.8)
Steps used: 720, (4–4/12 or 19% ∑ 39Ar)

SB66-32. P82224 DR16 groundmass. Preferred (minimum) Age >23 Ma
Comment: This was the worst of the three Lord Howe seamount chain groundmass samples. More hump-shaped, no real flat at top, more evidence for both argon loss and recoil. Probably go with top of the hump age again, but as minimum age (much less confident, perhaps it is significantly older, hard to tell).




P82224 DR16 gm
MSWD = 214.30 (> 1.89 [BAD fit])
Age =17.41 ± 1.79 Ma
(±1 sigma shown)
Atm.
40/36=394.2 ± 102.8
36/40
39/40
1200°C
1110°C
1040°C
980°C
550°C
920°C
610°C
870°C
820°C
670°C
720°C
770°C
0.004
0.003
0.002
0.001
0.000
0.000
0.110
0.220
0.330
0.440
0.550
0.660
0.770
0.880
0.990
1.100


P82224 DR16 gm
K/Ca
cumulative 39Ar
550°C
610°C
670°C
720°C
770°C
820°C
870°C
920°C
980°C
1040°C
1110°C
1200°C
2e-1
1e-1
6e-2
4e-2
3e-2
2e-2
1e-2
6e-3
4e-3
3e-3
2e-3
1e-3
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

SB66-44. P82194 plagioclase

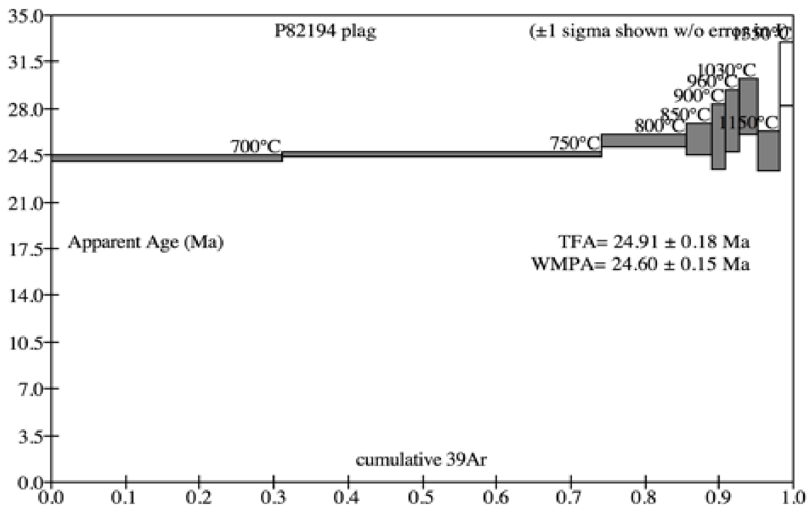
Labview

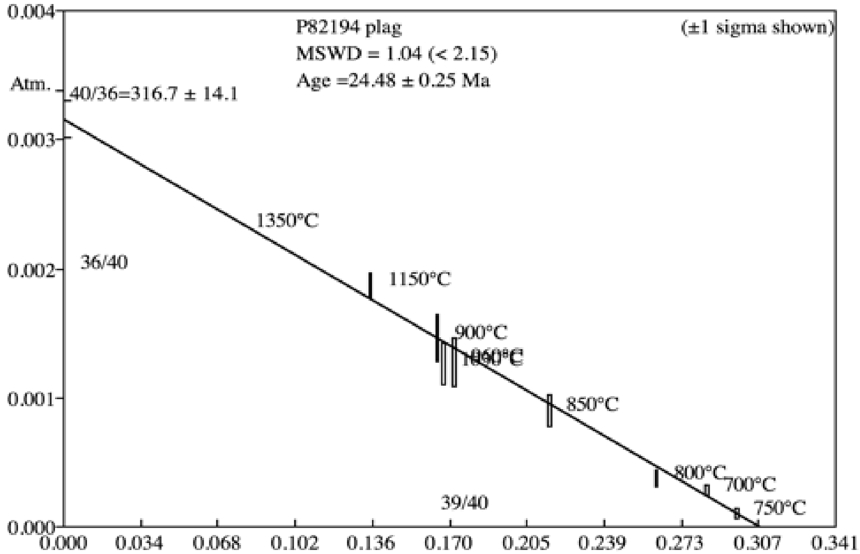
SB66-44P82194 24.3 mg plag J = 0.004199766 ± 0.00000843 Summary

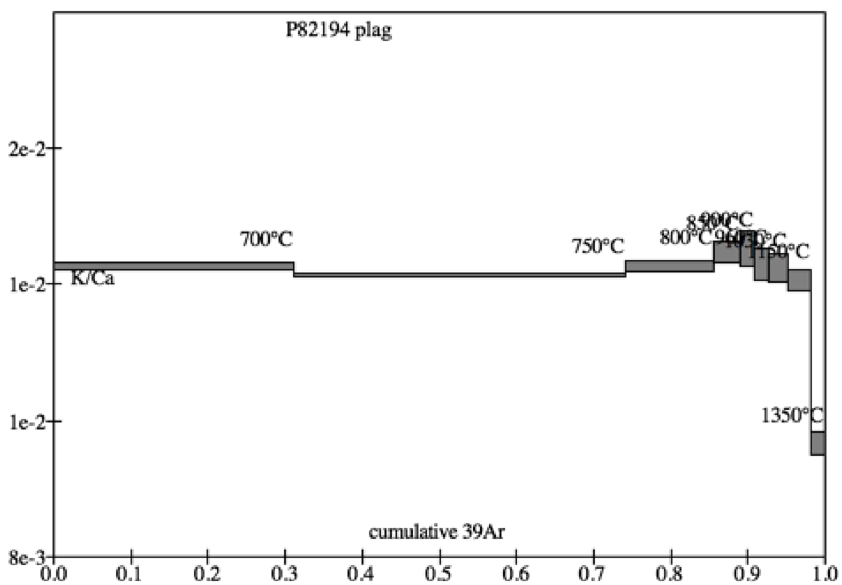
Exp#	Trf	Dwell	40Ar*	39K	%rad	K/Ca	Age(Ma)	±Age	40/39m	37/39m	36/39m
4B2536	700	16	0.746	0.231	91.59	0.01	24.281	0.244	3.4102	36.6142	0.0108
4B2537	750	16	1.040	0.318	97.02	0.01	24.568	0.207	3.2561	37.1396	0.0103
4B2538	800	16	0.288	0.085	88.98	0.01	25.572	0.507	3.6981	36.5816	0.0112
4B2539	850	16	0.086	0.025	73.29	0.01	25.688	1.228	4.5137	35.7453	0.0137
4B2540	900	16	0.046	0.013	56.74	0.01	25.870	2.437	5.8727	35.5049	0.0181
4B2541	960	16	0.054	0.015	62.28	0.01	27.107	2.349	5.6036	36.4863	0.0169
4B2542	1030	16	0.065	0.017	62.75	0.01	28.148	2.061	5.7759	36.6971	0.0171
4B2543	1150	16	0.071	0.022	44.65	0.01	24.793	1.486	7.1373	37.3939	0.0234
4B2544	1350	16	0.058	0.014	31.27	0.01	30.561	2.435	12.4545	48.8307	0.0421

Total fusion age, TFA= 24.91 ± 0.18 Ma (including J)
Weighted mean plateau age, WMPA= 24.60 ± 0.15 Ma (including J)
Inverse isochron age =24.48 ± 0.25 Ma. (MSWD =1.04; 40Ar/36Ar=316.7 ± 14.1)
Steps used: 700, 750, 800, 850, 900, 960, 1030, 1150, (1–8/9 or 98% ∑ 39Ar)

SB66-44. P82194 plag. Preferred Age =24.6 ± 0.15 Ma
Comment: Excellent flat spectrum, with reasonably high K/Ca ratios (.013). Rad yields are good for most of spectrum (60-95%). Well defined plateau and isochron, good sample. WMPA (700-1150C steps, 98% of gas = 24.6 ± 0.15 Ma. Isochron Age (700-1150C steps, 98% of gas) = 24.5 ± 0.5 Ma.




P82194 plag
MSWD = 1.04 (< 2.15)
Age =24.48 ± 0.25 Ma
(±1 sigma shown)
Atm.
40/36=316.7 ± 14.1
36/40
39/40
1350°C
1150°C
900°C
850°C
800°C
700°C
750°C
0.004
0.003
0.002
0.001
0.000
0.000
0.034
0.068
0.102
0.136
0.170
0.205
0.239
0.273
0.307
0.341


P82194 plag
K/Ca
cumulative 39Ar
700°C
750°C
800°C
900°C
1350°C
2e-2
1e-2
1e-2
8e-3
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

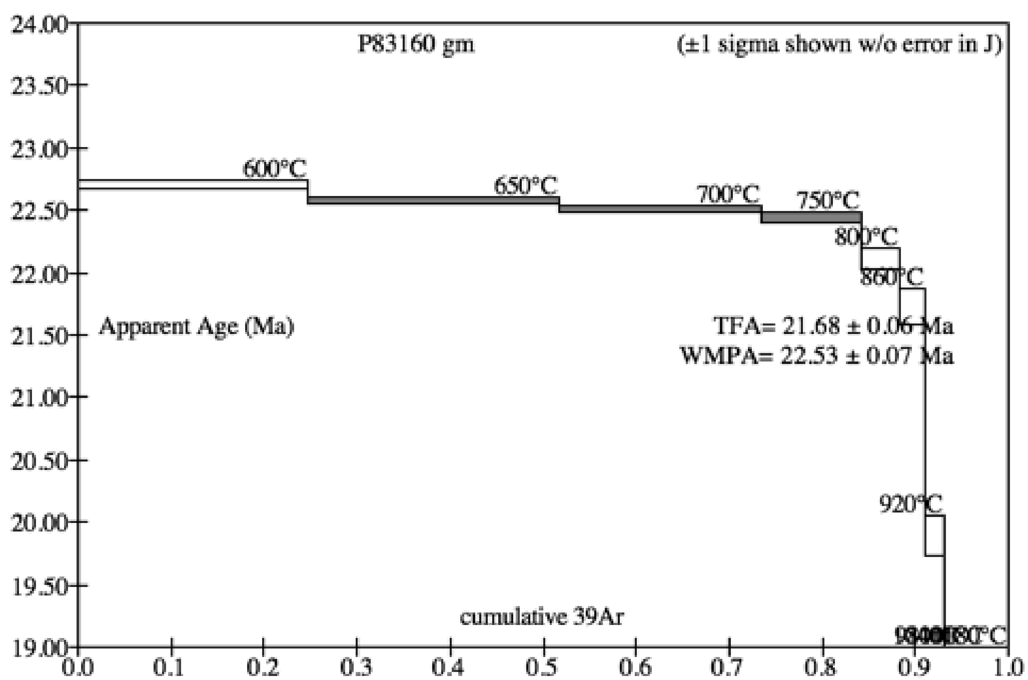
SB67-24. P83160 groundmass

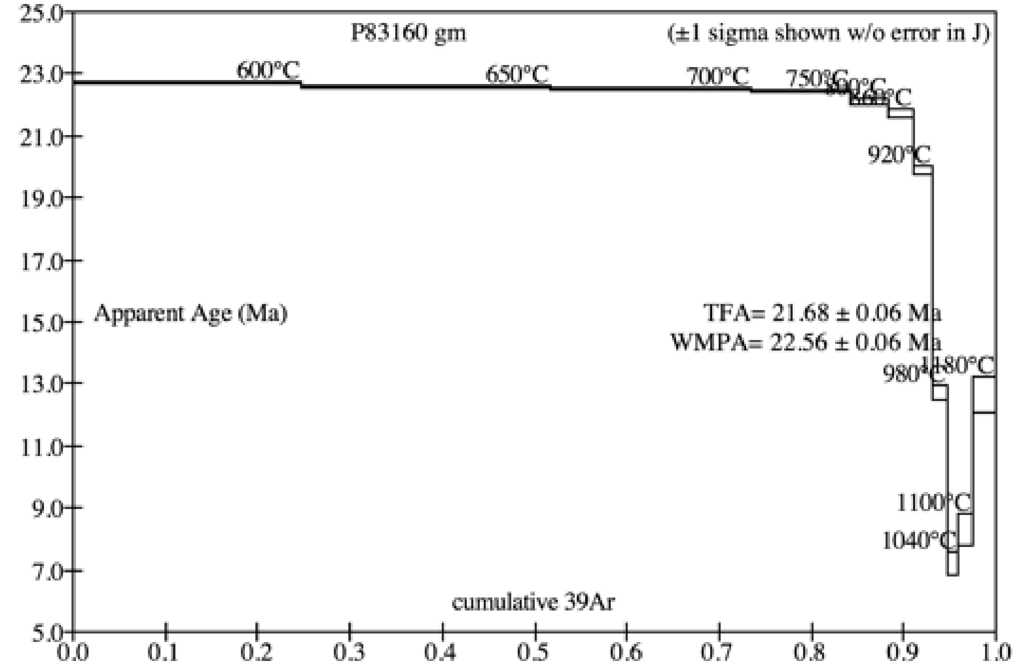
J=0.0032000

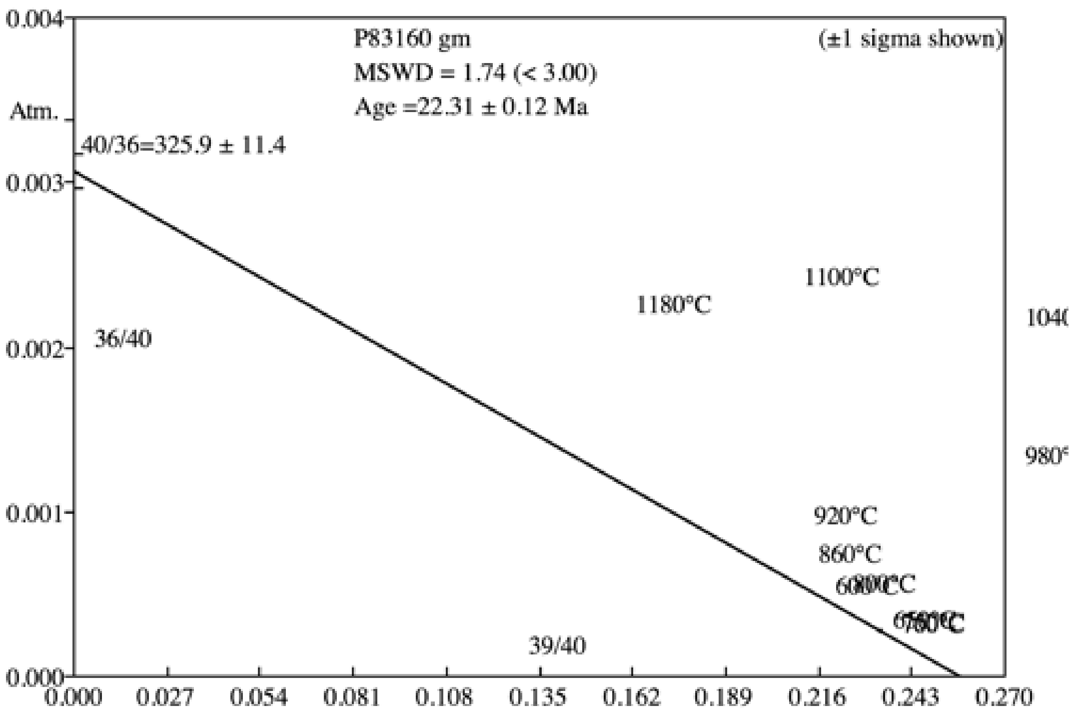
T	t	40(mol)	40/39	38/39	37/39	36/39	K/Ca	∑ 39Ar	40Ar*	Age (Ma)
600	12	8.1e-14	4.6540	0.0e+0	0.1852	0.0024	2.6	0.24754	0.851	22.7 ± 0.1
650	12	8.2e-14	4.3145	0.0e+0	0.1306	0.0013	3.8	0.51788	0.912	22.6 ± 0.1
700	12	6.5e-14	4.2753	0.0e+0	0.4072	0.0012	1.2	0.73515	0.918	22.5 ± 0.1
750	12	3.2e-14	4.2715	0.0e+0	0.1584	0.0012	3.1	0.84131	0.916	22.4 ± 0.1
800	12	1.4e-14	4.5464	0.0e+0	0.5673	0.0023	0.86	0.88372	0.848	22.1 ± 0.1
860	12	8.7e-15	4.7641	3.8e-4	1.0217	0.0033	0.48	0.90975	0.795	21.7 ± 0.2
920	12	7.3e-15	4.7900	1.7e-3	1.8537	0.0045	0.26	0.93135	0.723	19.9 ± 0.2
980	12	4.1e-15	3.5901	4.1e-3	4.7251	0.0047	0.10	0.94776	0.617	12.7 ± 0.2
1040	12	2.7e-15	3.3771	1.2e-2	17.1663	0.0072	0.029	0.95916	0.371	7.2 ± 0.4
1100	12	4.8e-15	4.8580	4.0e-2	72.1465	0.0115	0.007	0.97397	0.298	8.3 ± 0.5
1180	12	9.8e-15	6.3803	5.0e-2	219.4237	0.0141	0.002	1.00000	0.346	12.7 ± 0.6

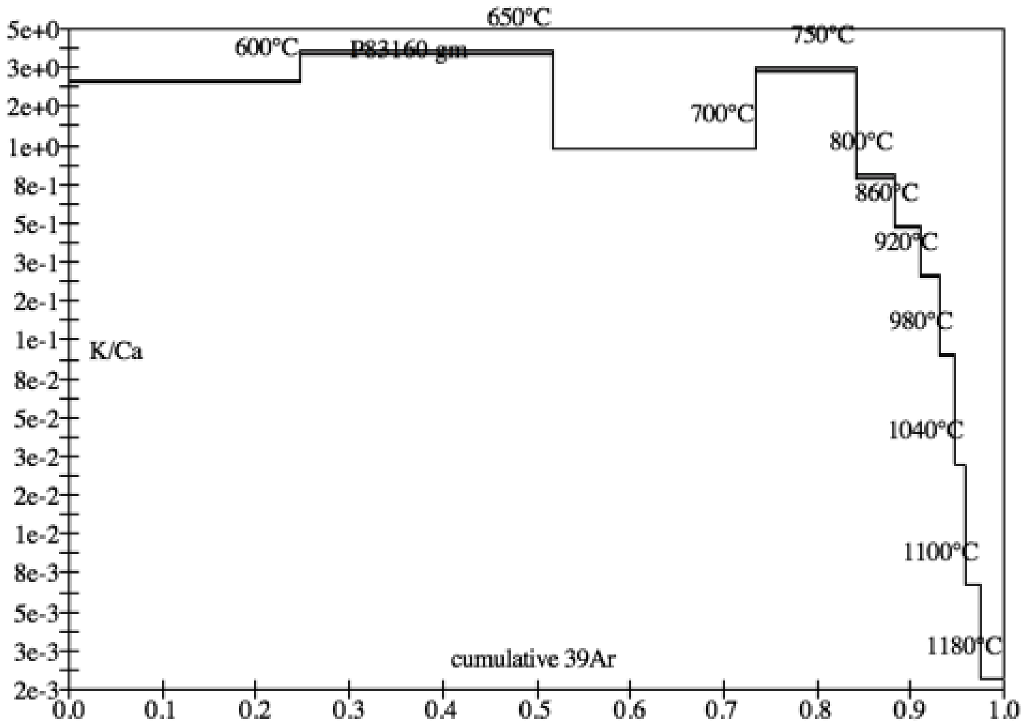
Total fusion age, TFA= 21.68 ± 0.06 Ma (including J)
Weighted mean plateau age, WMPA= 22.53 ± 0.07 Ma (including J)
Inverse isochron age =21.15 ± 1.01 Ma. (MSWD =1.18; 40Ar/36Ar=491.5 ± 147.2)
Steps used: 650, 700, 750, (2–4/11 or 59% ∑ 39Ar)

SB67-24. P83160 groundmass. Preferred age 22.5 ± 0.2 Ma
Comment: Pretty good data. Most gas came out at fairly low T - not surprising given very f.g. matrix. Age spectrum consists of a broad low T flat (actually slightly descending) followed by abrupt drop associated with plummet of K/Ca values. Ages decrease from 22.7 to 22.4 per first 85% of gas released, then plummet to ages as low as 7 Ma in the highest T steps (associated with degassing of Ca-rich phases). Most of the spectrum has high K/Ca (1-3) and high %rad (85-92%). Spectrum typical of recoil - trust the middle part of the spectrum the most. TFA = 21.68 Ma, I would use mean age from 650-750° steps - Isochron age is 22.3 ± 0.24, WMPA = 22.53 ± 0.14 (2 sigma). Given evidence for recoil, and monotonically descending ages, I would report 22.5 ± 0.2 Ma. My only concern would be whether these K/Ca ratios are unrealistically high - any chance of K metasomatism and that we are dealing with a hydrothermal age??




P83160 gm
(±1 sigma shown w/o error in J)
600°C
650°C
700°C
750°C
800°C
860°C
920°C
Apparent Age (Ma)
TFA= 21.68 ± 0.06 Ma
WMPA= 22.56 ± 0.06 Ma
980°C
1180°C
1100°C
1040°C
cumulative 39Ar


P83160 gm
(±1 sigma shown)
MSWD = 1.74 (< 3.00)
Age =22.31 ± 0.12 Ma
Atm.
40/36=325.9 ± 11.4
1100°C
1180°C
36/40
920°C
860°C
39/40



650°C
600°C
P83160 gm
750°C
700°C
800°C
860°C
920°C
980°C
1040°C
1100°C
1180°C
K/Ca
cumulative 39Ar
5e+0
3e+0
2e+0
1e+0
8e-1
5e-1
3e-1
2e-1
1e-1
8e-2
5e-2
3e-2
2e-2
1e-2
8e-3
5e-3
3e-3
2e-3
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

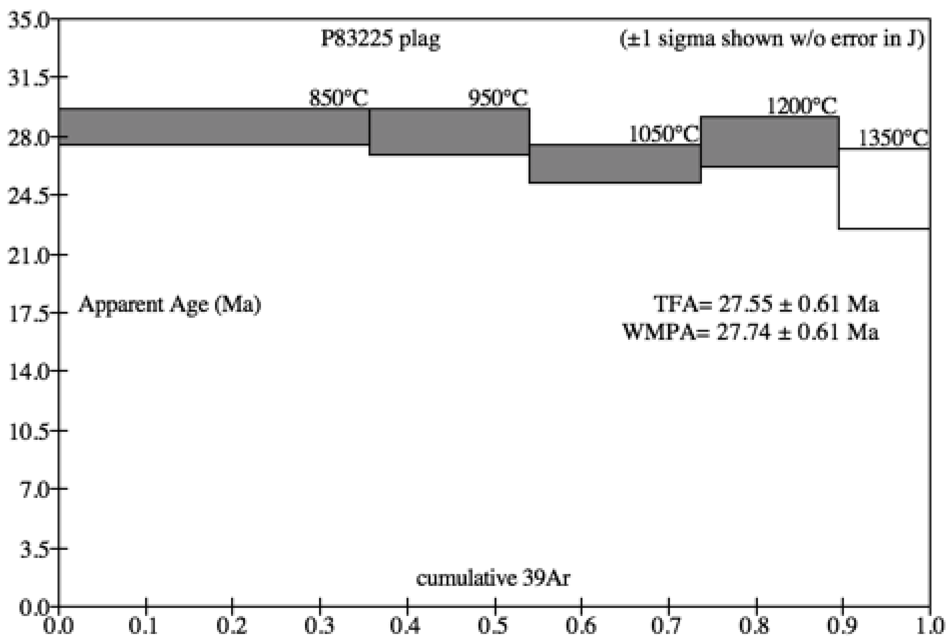
SB67-29. P83225 plagioclase

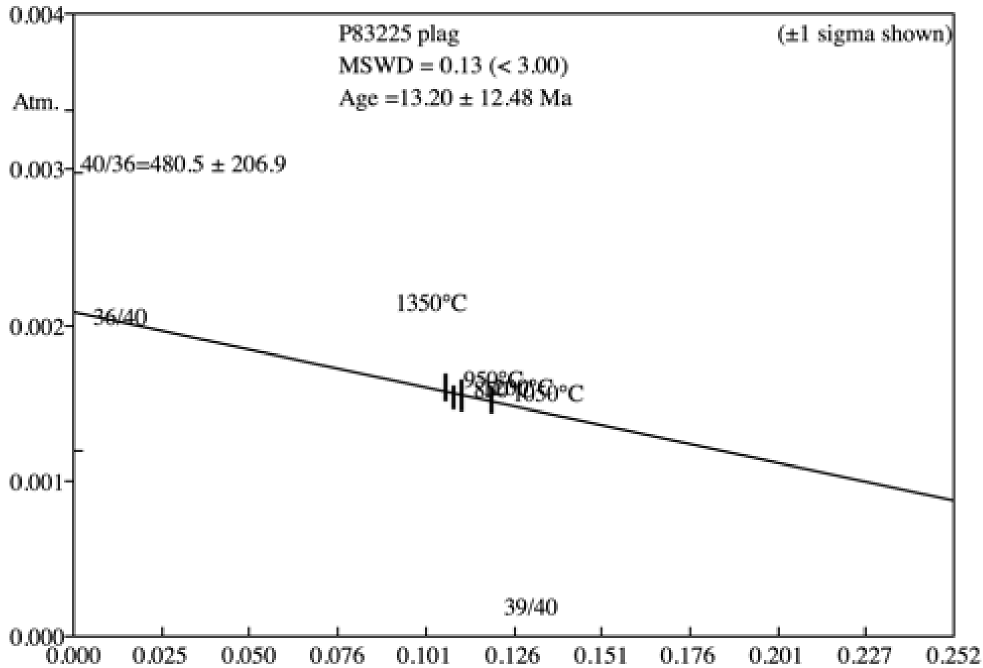
J=0.0031800

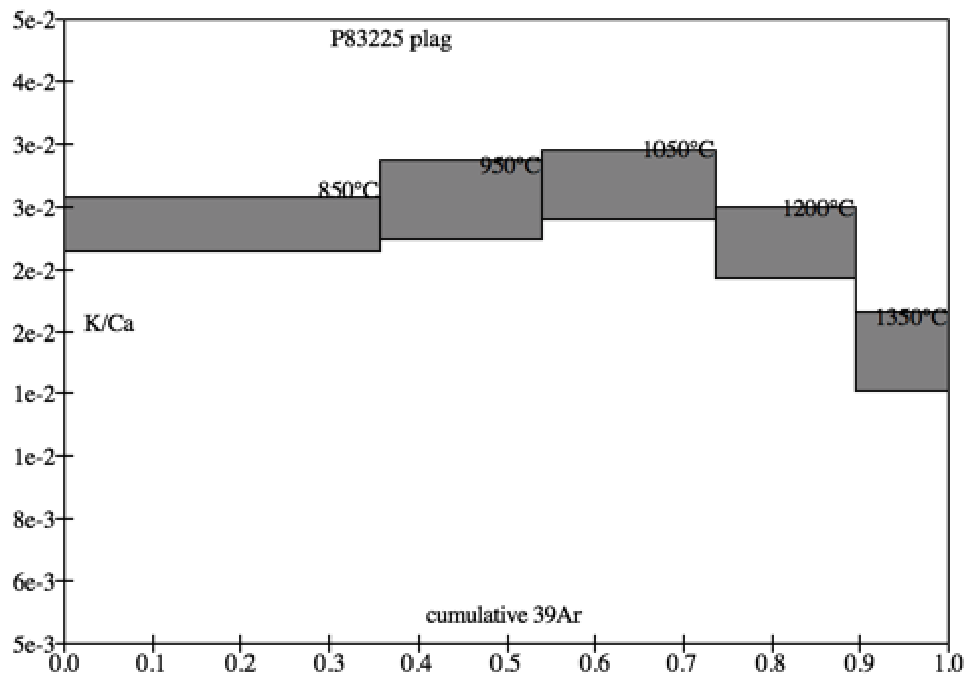
T	t	40(mol)	40/39	38/39	37/39	36/39	K/Ca	∑ 39Ar	40Ar*	Age (Ma)
850	14	5.1e-15	9.1839	0.0e+0	20.8129	0.0141	0.024	0.35654	0.547	28.6 ± 1.0
950	14	2.7e-15	9.4151	0.0e+0	18.9191	0.0151	0.026	0.53910	0.527	28.3 ± 1.4
1050	14	2.6e-15	8.3587	0.0e+0	17.9439	0.0126	0.027	0.73621	0.553	26.3 ± 1.2
1200	14	2.2e-15	9.0006	0.0e+0	22.1458	0.0140	0.022	0.89566	0.541	27.7 ± 1.5
1350	14	1.9e-15	11.5413	2.1e-3	33.1240	0.0243	0.015	1.00000	0.379	24.9 ± 2.3

Total fusion age, TFA= 27.55 ± 0.61 Ma (including J)
Weighted mean plateau age, WMPA= 27.74 ± 0.61 Ma (including J)
Inverse isochron age =13.20 ± 12.48 Ma. (MSWD =0.13; 40Ar/36Ar=480.5 ± 74.1)
Steps used: 850, 950, 1050, 1200, (1–4/5 or 90% ∑ 39Ar)

SB67-29. P83225 plag. Preferred age = 27.74 ± 0.61 Ma
Comment: The gettering capacity was cranked up, and it was a smaller sample, so most or all of the nasty non-argon gas was able to be cleaned up. This data looks quite good. Fairly flat (but slightly descending spectrum) with ages that step down from 28.5 to 25 Ma, K/Cas of ~.025, and decent ~55% radiogenic. TFA = 27.55, Isochron age = 13.2 ± 25 Ma, WMPA = 27.74 ± 0.61 Ma. I would report the WMPA, this uses 90% of gas released and seems to be a decent age but a fairly high uncertainty.




P83225 plag
(±1 sigma shown)
MSWD = 0.13 (< 3.00)
Age =13.20 ± 12.48 Ma
Atm.
40/36=480.5 ± 206.9
1350°C
36/40
1050°C
39/40
0.004
0.003
0.002
0.001
0.000
0.000
0.025
0.050
0.076
0.101
0.126
0.151
0.176
0.201
0.227
0.252


P83225 plag
850°C
950°C
1050°C
1200°C
1350°C
K/Ca
cumulative 39Ar
5e-2
4e-2
3e-2
3e-2
2e-2
2e-2
1e-2
1e-2
8e-3
6e-3
5e-3
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

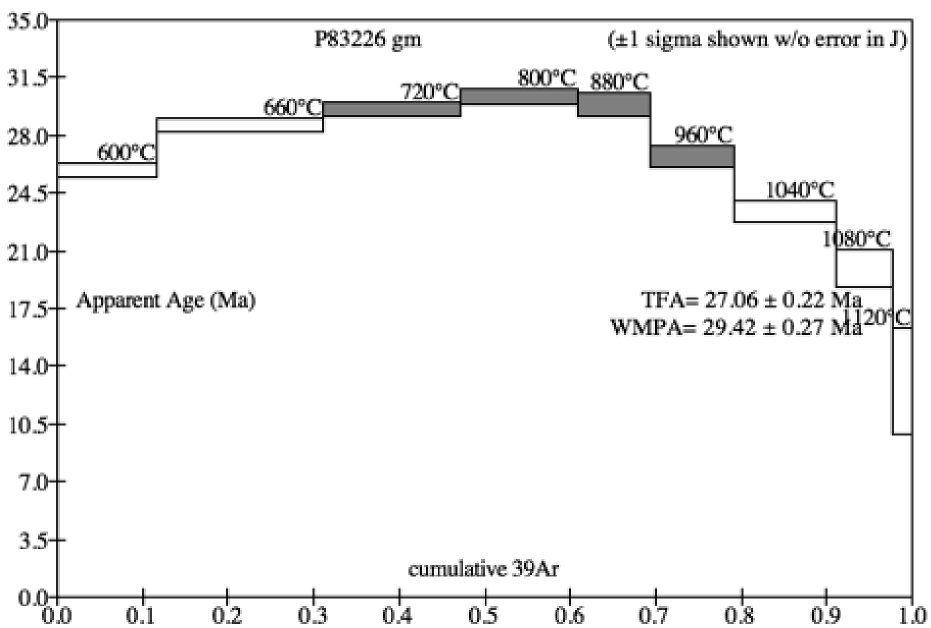
SB67-31. P83226 groundmass

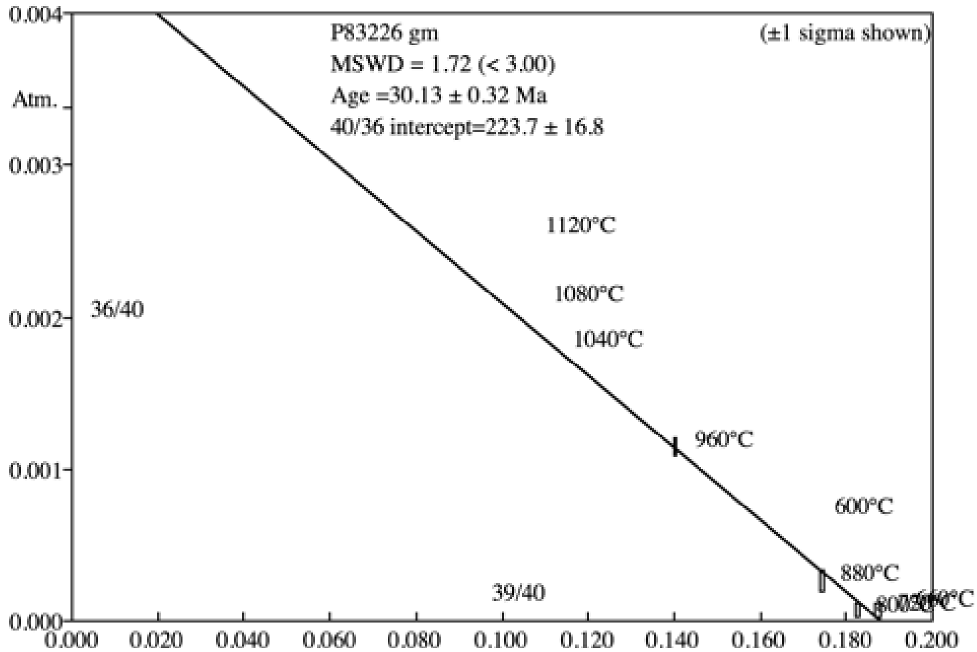
J=0.0031660

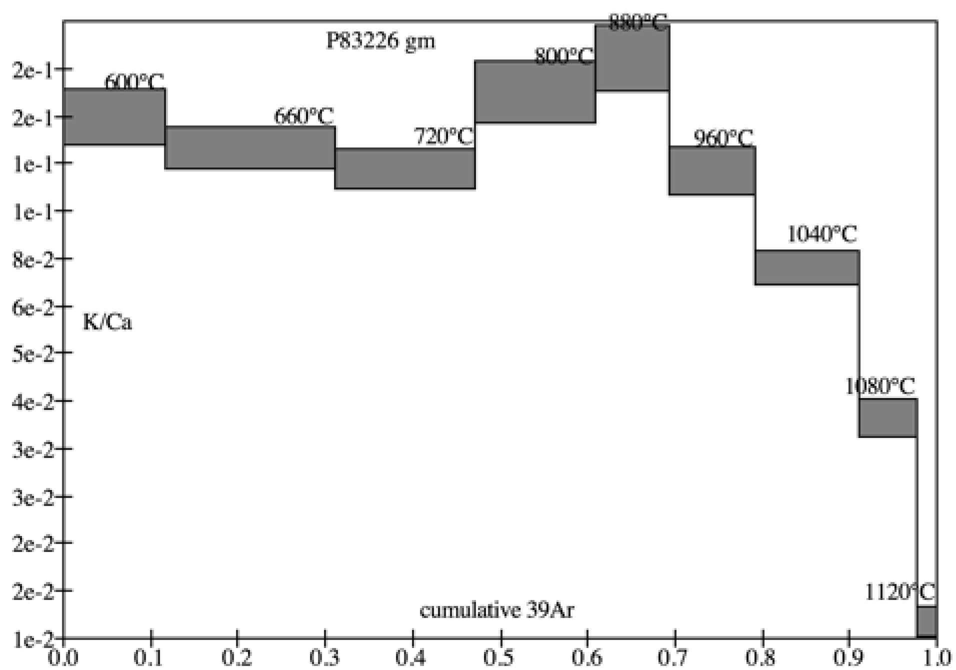
T	t	40(mol)	40/39	38/39	37/39	36/39	K/Ca	∑ 39Ar	40Ar*	Age (Ma)
600	12	3.1e-15	5.7803	8.1e-4	3.0882	0.0041	0.16	0.11740	0.791	25.9 ± 0.5
660	12	4.6e-15	5.2127	0.0e+0	3.6172	0.0005	0.14	0.31127	0.969	28.6 ± 0.4
720	12	3.9e-15	5.3340	0.0e+0	3.9834	0.0004	0.12	0.47114	0.978	29.6 ± 0.4
800	12	3.4e-15	5.4712	0.0e+0	2.7203	0.0004	0.18	0.60786	0.979	30.3 ± 0.5
880	12	2.2e-15	5.7344	0.0e+0	2.3082	0.0015	0.21	0.69412	0.921	29.9 ± 0.7
960	12	3.1e-15	7.1254	0.0e+0	4.0253	0.0082	0.12	0.79066	0.661	26.7 ± 0.7
1040	12	4.9e-15	8.9142	0.0e+0	6.4460	0.0162	0.076	0.91116	0.463	23.4 ± 0.6
1080	12	2.8e-15	9.3022	0.0e+0	13.3856	0.0196	0.037	0.97769	0.377	19.9 ± 1.1
1120	12	9.3e-16	9.4701	2.6e-3	36.5304	0.0243	0.013	1.00000	0.242	13.1 ± 3.2

Total fusion age, TFA= 27.06 ± 0.22 Ma (including J)
Weighted mean plateau age, WMPA= 29.42 ± 0.27 Ma (including J)
Inverse isochron age =30.13 ± 0.32 Ma. (MSWD =1.72; 40Ar/36Ar=223.7 ± 16.8)
Steps used: 720, 800, 880, 960, (3–6/9 or 48% ∑ 39Ar)

SB67-31. P83226 groundmass. Preferred age 29.5 ± 1.0 Ma
Comment: SB67-31 degassed in a typical groundmass fashion, though there were some regression problems on the first 3 (low T steps). Typical hump-shape indicating both low T argon loss and recoil, ages climb from 26 to 30 Ma, flatten a bit, and then descend to 13 Ma at high T. The central pseudo-plateau part of the spectrum is to be trusted the most. TFA = 27.06 Ma, Isochron age = 30.1 ± 0.64 Ma, "WMPA" = 29.4 ± 0.54. Given that it is not strictly a plateau and the uncertainties as to what part of the spectrum is most reliable, the age is best reported as 29.5 ± 1.0 Ma - i.e. increase the uncertainty a lot.




P83226 gm
MSWD = 1.72 (< 3.00)
Age =30.13 ± 0.32 Ma
40/36 intercept=223.7 ± 16.8
(±1 sigma shown)
Atm.
36/40
39/40
1120°C
1080°C
1040°C
960°C
600°C
880°C


P83226 gm
K/Ca
cumulative 39Ar
600°C
660°C
720°C
800°C
880°C
960°C
1040°C
1080°C
1120°C

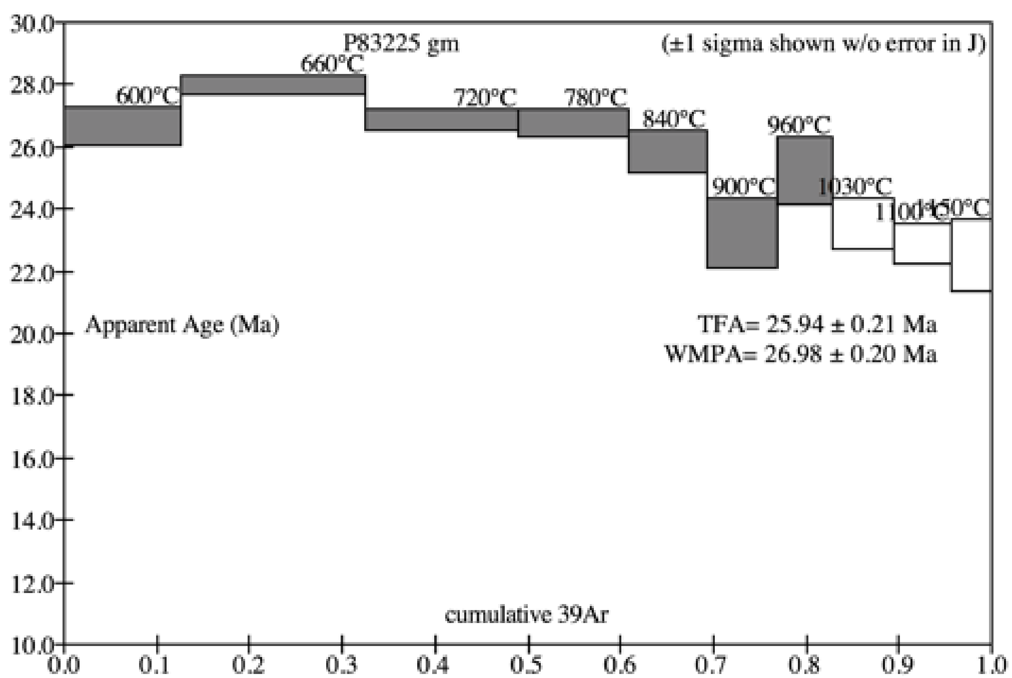
SB67-60. P83225 groundmass

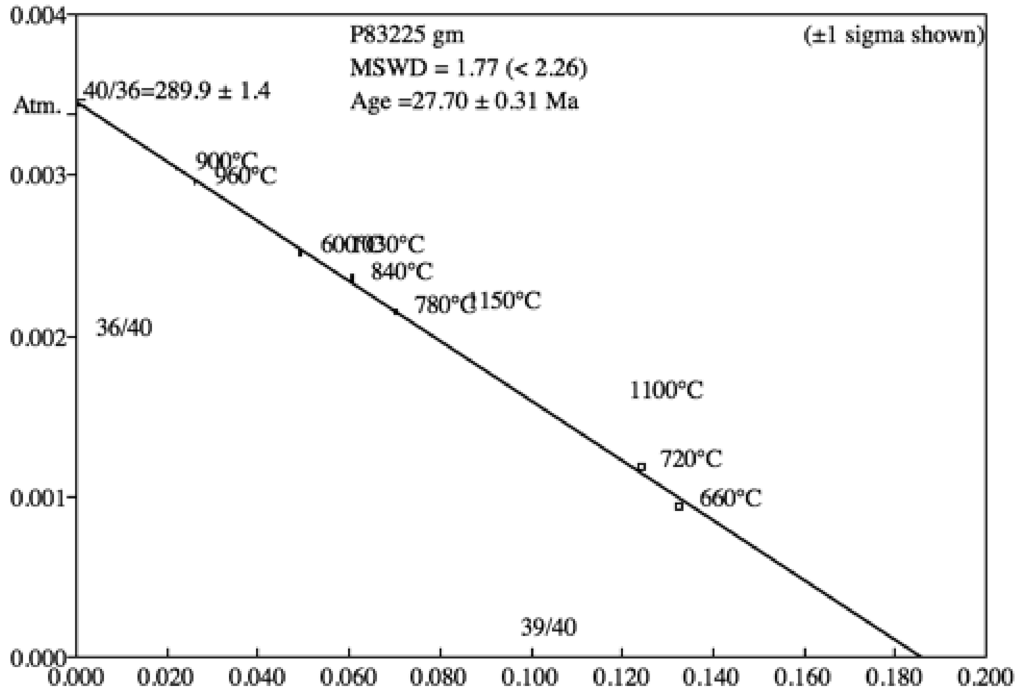
J=0.0028719

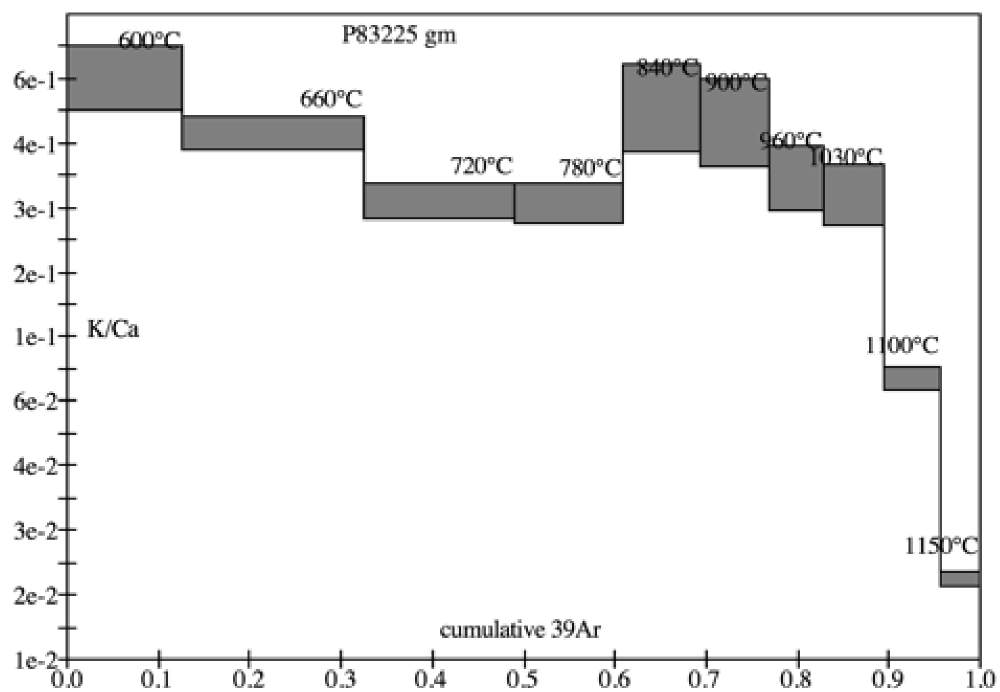
T	t	40(mol)	40/39	38/39	37/39	36/39	K/Ca	∑ 39Ar	40Ar*	Age (Ma)
600	12	1.8e-14	20.3001	0.0e+0	0.7572	0.0511	0.65	0.12557	0.255	26.7 ± 0.6
660	12	1.0e-14	7.5431	3.5e-5	1.1485	0.0071	0.43	0.32464	0.722	28.0 ± 0.3
720	12	9.3e-15	8.0486	2.9e-4	1.8499	0.0095	0.26	0.48982	0.650	26.9 ± 0.4
780	12	1.2e-14	14.2613	5.3e-4	1.8873	0.0306	0.26	0.60780	0.365	26.8 ± 0.5
840	12	9.8e-15	16.5192	0.0e+0	0.9226	0.0389	0.53	0.69268	0.304	25.8 ± 0.7
900	12	2.4e-14	45.4550	0.0e+0	1.0173	0.1386	0.48	0.76858	0.099	23.2 ± 1.1
960	12	1.6e-14	38.3781	1.0e-3	1.5433	0.1133	0.32	0.82761	0.128	25.3 ± 1.1
1030	12	8.4e-15	17.8751	3.8e-4	1.7394	0.0450	0.28	0.89484	0.256	23.5 ± 0.8
1100	12	3.6e-15	8.5382	1.3e-3	6.6141	0.0139	0.074	0.95562	0.521	22.9 ± 0.7
1150	12	3.7e-15	12.2468	2.0e-3	27.8026	0.0266	0.018	1.00000	0.357	22.5 ± 1.1

Total fusion age, TFA= 25.94 ± 0.21 Ma (including J)
Weighted mean plateau age, WMPA= 26.98 ± 0.20 Ma (including J)
Inverse isochron age =27.70 ± 0.31 Ma. (MSWD =1.77; 40Ar/36Ar=289.9 ± 1.4)
Steps used: 600, 660, 720, 780, 840, 900, 960, (1–7/10 or 83% ∑ 39Ar)

SB67-60. P83225 groundmass Preferred age: 27.0 ± 0.5 Ma.
Comment: Companion to plag from same sample (SB67-29). Not very good regressions on first couple of steps (nasty gas being released). Overall spectrum is pretty flat at ~27 Ma for first 80% released, then drops a bit to 23 Ma. K/Ca s are good (0.3 to).65. 10-65% radiogenic. TFA = 25.94 Ma, Isochron = 27.7 ±0.62, WMPA= 27.0±0.4 Taking the weighted mean age for the first 80% and then increasing the uncertainty is reasonable interpretation - would quote age as 27.0 ± 0.5 Ma. Nice to see it is concordant with the plag. Weighted mean of P83225 ages is 27.3 ± 0.4 Ma.




P83225 gm
(±1 sigma shown)
MSWD = 1.77 (< 2.26)
Age =27.70 ± 0.31 Ma
40/36=289.9 ± 1.4
Atm.
36/40
39/40
900°C
960°C
600°C
1030°C
840°C
780°C
1150°C
1100°C
720°C
660°C


P83225 gm
600°C
660°C
720°C
780°C
840°C
900°C
960°C
1030°C
1100°C
1150°C
K/Ca
cumulative 39Ar

SB67-62. P83198 groundmass

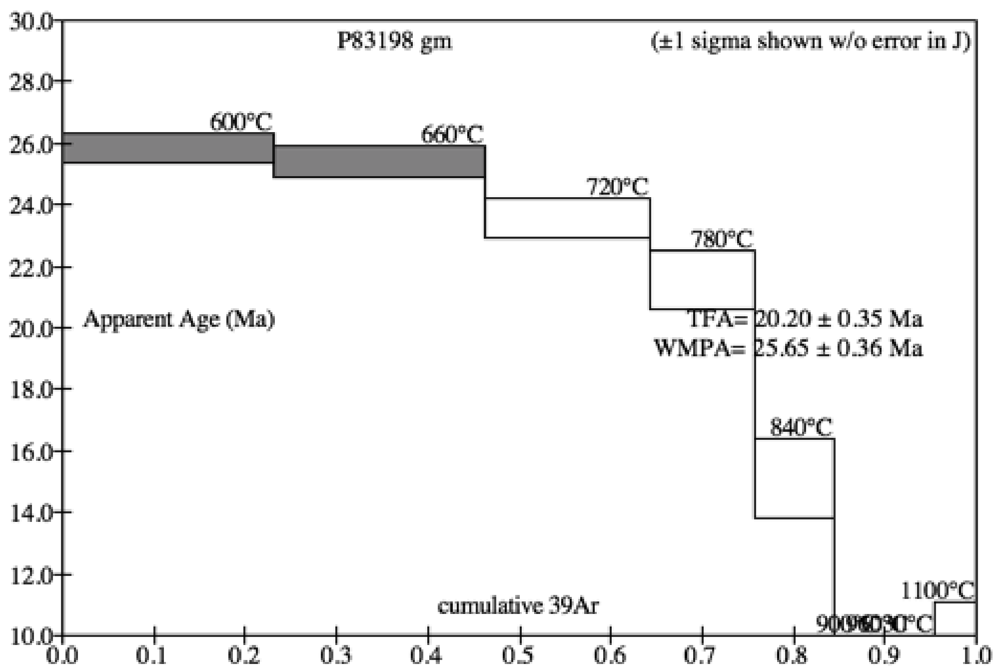
J=0.0028742

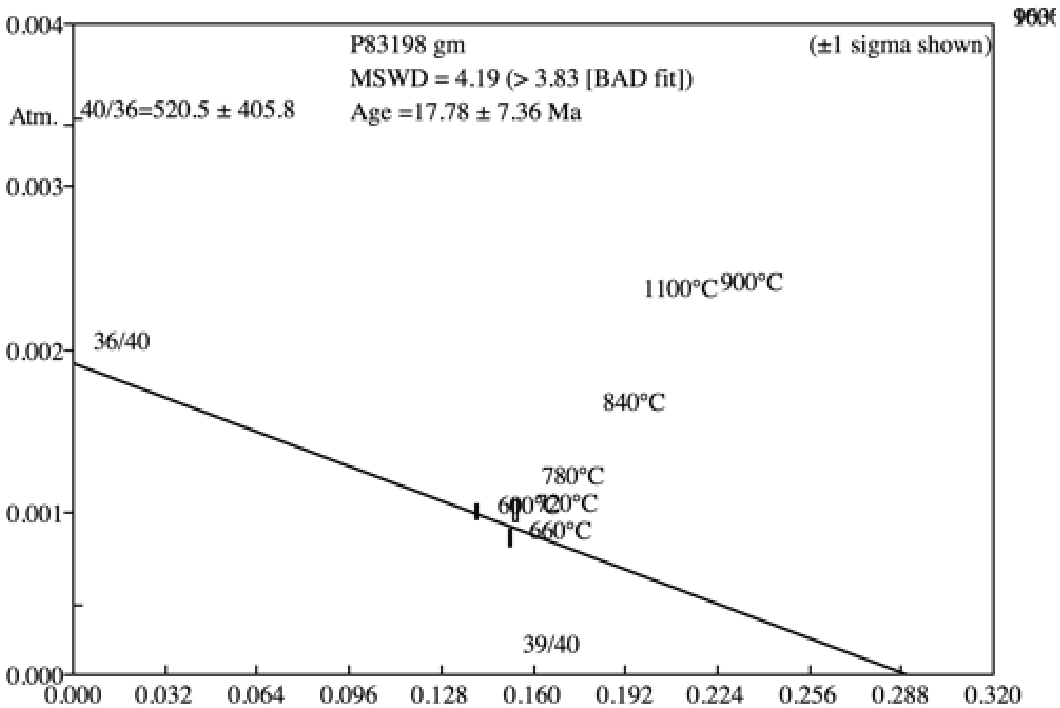
T	t	40(mol)	40/39	38/39	37/39	36/39	K/Ca	∑ 39Ar	40Ar*	Age (Ma)
600	12	5.1e-15	7.1239	7.3e-3	1.6662	0.0071	0.29	0.23189	0.705	25.9 ± 0.5
660	12	4.7e-15	6.5838	6.9e-3	3.1389	0.0056	0.16	0.46304	0.750	25.4 ± 0.5
720	12	3.6e-15	6.5101	7.0e-3	3.4307	0.0065	0.14	0.64204	0.703	23.6 ± 0.7
780	12	2.3e-15	6.4015	8.1e-3	2.3894	0.0075	0.21	0.75636	0.654	21.6 ± 1.0
840	12	1.5e-15	5.6526	7.6e-3	2.5949	0.0092	0.19	0.84357	0.519	15.1 ± 1.3
900	12	7.2e-16	4.5766	1.4e-2	3.1845	0.0108	0.15	0.89437	0.302	7.1 ± 2.2
960	12	2.6e-16	2.6778	1.5e-2	3.7957	0.0141	0.13	0.92583	-0.561	-7.8 ± 3.5
1030	12	2.7e-16	2.9742	1.1e-2	7.8033	0.0143	0.063	0.95508	-0.419	-6.5 ± 3.9
1100	12	7.1e-16	5.2267	6.9e-3	21.7637	0.0121	0.023	1.00000	0.314	8.5 ± 2.6

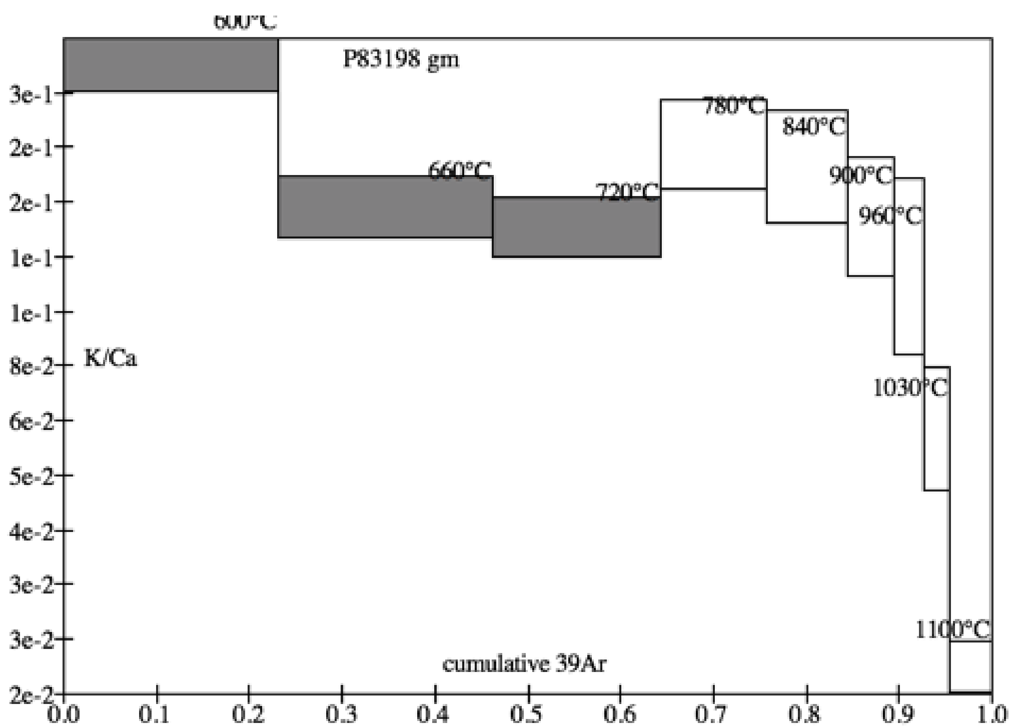
Total fusion age, TFA= 20.20 ± 0.35 Ma (including J)
Weighted mean plateau age, WMPA= 25.65 ± 0.36 Ma (including J)
Inverse isochron age =17.78 ± 7.36 Ma. (MSWD =4.19; 40Ar/36Ar=520.5 ± 405.8)
Steps used: 600, 660, (1–2/9 or 46% ∑ 39Ar)

SB67-62. P83198 groundmass. Possible age 25.5 ± 1.25 Ma

Comment: Not a lot of confidence in these results. Most gas was released at very low Ts (always a bad sign), K/Cas are OK (.13-.21) and 30-70% rad, but signals are pretty tiny - suspect there is simply not much K in this sample and it is held mainly in clays. Ages start of fairly flat at ~26 Ma, but monotonically decrease - big recoil problem. TFA = 20.2 Ma, no good plateau or isochron, best to probably quote age of first 2 steps but beef up the uncertainty - 25.5 ± 1.25 Ma. Not really sure if this is an igneous or hydrothermal age.




P83198 gm
MSWD = 4.19 (> 3.83 [BAD fit])
Age =17.78 ± 7.36 Ma
(±1 sigma shown)
Atm.
40/36=520.5 ± 405.8
36/40
39/40
1100°C
900°C
840°C
780°C
720°C
660°C
0.004
0.003
0.002
0.001
0.000
0.000
0.032
0.064
0.096
0.128
0.160
0.192
0.224
0.256
0.288
0.320


P83198 gm
660°C
720°C
780°C
840°C
900°C
960°C
1030°C
1100°C
K/Ca
cumulative 39Ar
3e-1
2e-1
2e-1
1e-1
1e-1
8e-2
6e-2
5e-2
4e-2
3e-2
3e-2
2e-2
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

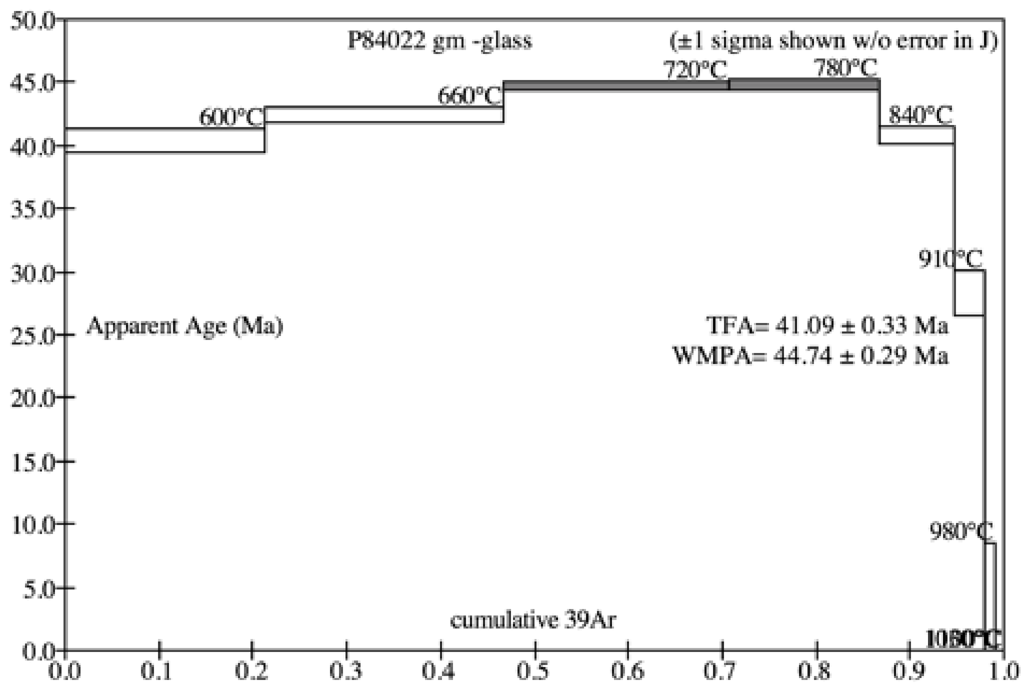
SB67-65. P84022 glass

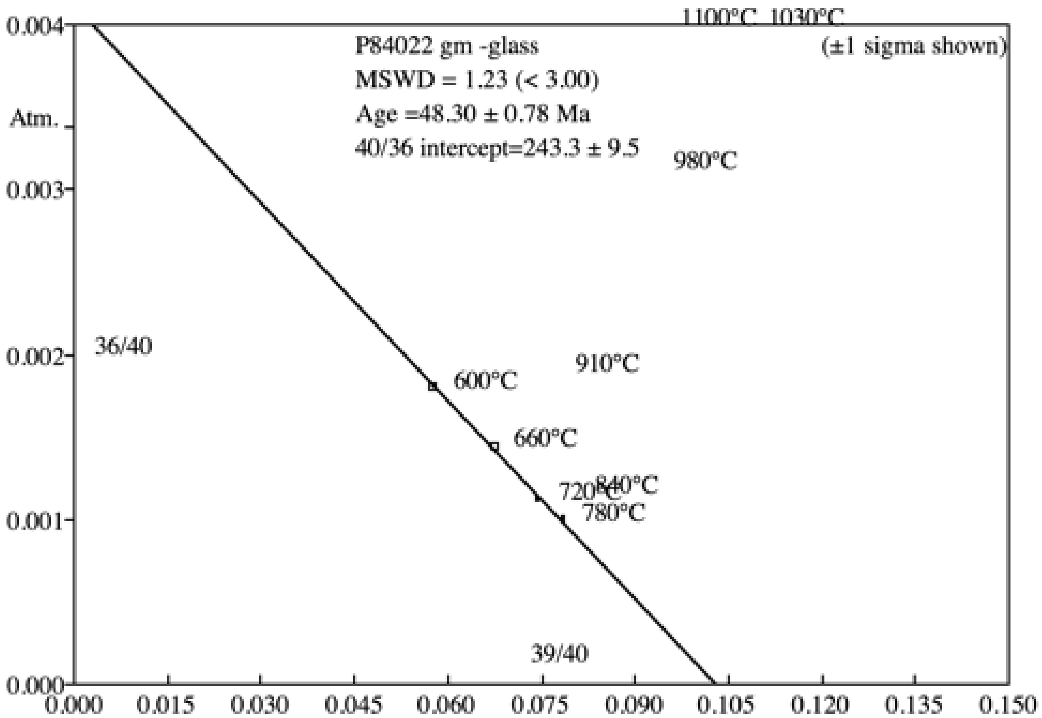
J=0.0027940

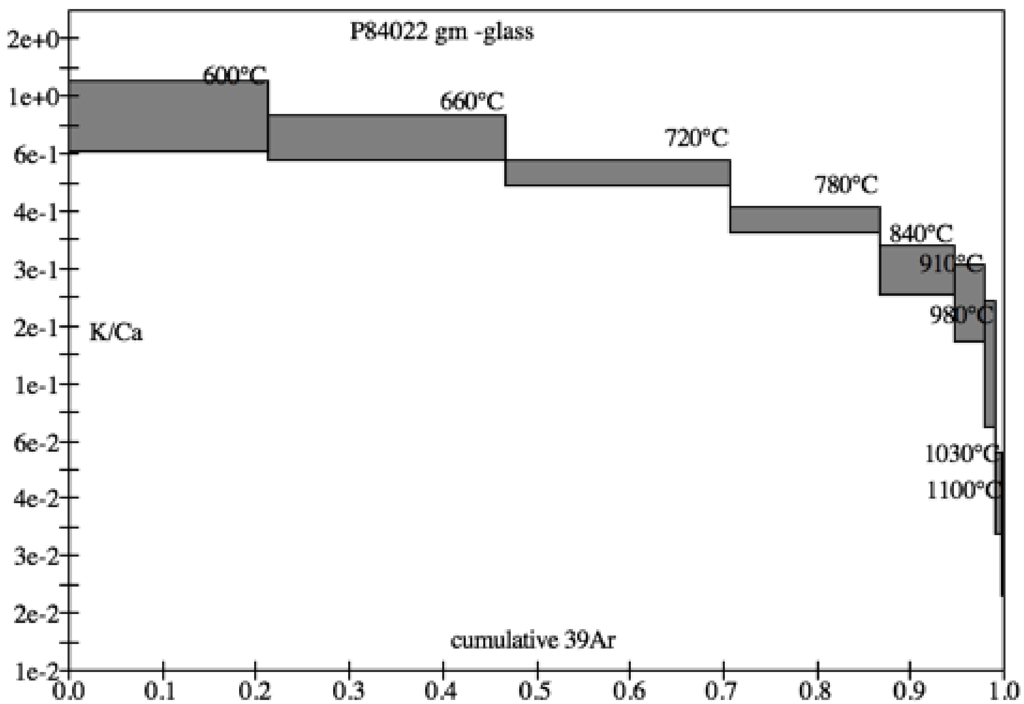
T	t	40(mol)	40/39	38/39	37/39	36/39	K/Ca	∑ 39Ar	40Ar*	Age (Ma)
600	12	2.7e-14	17.3671	1.3e-2	0.5534	0.0313	0.89	0.21279	0.467	40.4 ± 1.0
660	12	2.8e-14	14.8404	1.3e-2	0.6735	0.0214	0.73	0.46695	0.573	42.4 ± 0.6
720	12	2.4e-14	13.4436	1.2e-2	0.9030	0.0151	0.54	0.70602	0.669	44.7 ± 0.4
780	12	1.5e-14	12.7671	1.2e-2	1.3227	0.0128	0.37	0.86616	0.705	44.8 ± 0.4
840	12	7.4e-15	12.4750	1.2e-2	1.9427	0.0145	0.25	0.94769	0.657	40.8 ± 0.7
910	12	3.0e-15	12.9462	1.2e-2	2.4774	0.0247	0.20	0.97913	0.437	28.3 ± 1.8
980	12	9.9e-16	10.7307	1.5e-2	3.7499	0.0336	0.13	0.99174	0.076	4.1 ± 4.4
1030	12	3.3e-16	9.2421	3.2e-2	11.3728	0.0595	0.043	0.99664	-0.902	-42.6 ± 11.4
1100	12	2.6e-16	10.6317	4.3e-2	15.2110	0.0793	0.032	1.00000	-1.203	-65.8 ± 17.1

Total fusion age, TFA= 41.09 ± 0.33 Ma (including J)
Weighted mean plateau age, WMPA= 44.74 ± 0.29 Ma (including J)
Inverse isochron age =48.30 ± 0.78 Ma. (MSWD =1.23; 40Ar/36Ar=243.3 ± 9.5)
Steps used: 720, 780, (3–4/9 or 40% ∑ 39Ar)

SB67-65. P84022 glass
Comment: Bad regressions/high backgrounds on first few steps, but rest was good, spectrum climbs from 40 to a 44 Ma minplateau, then plummets to negative ages at highest Ts, associated with low K/Ca. Classic low T loss plus recoil spectrum - trust the middle flat the most - ~ 44.75 ± 0.3 Ma - but honestly hard to evaluate uncertainty.




1100°C 1030°C
P84022 gm -glass
(±1 sigma shown)
MSWD = 1.23 (< 3.00)
Age =48.30 ± 0.78 Ma
40/36 intercept=243.3 ± 9.5
Atm.
980°C
36/40
910°C
600°C
660°C
720°C
840°C
780°C
39/40
0.004
0.003
0.002
0.001
0.000
0.000
0.015
0.030
0.045
0.060
0.075
0.090
0.105
0.120
0.135
0.150


P84022 gm -glass
600°C
660°C
720°C
780°C
840°C
910°C
980°C
1030°C
1100°C
K/Ca
cumulative 39Ar
2e+0
1e+0
6e-1
4e-1
3e-1
2e-1
1e-1
6e-2
4e-2
3e-2
2e-2
1e-2
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

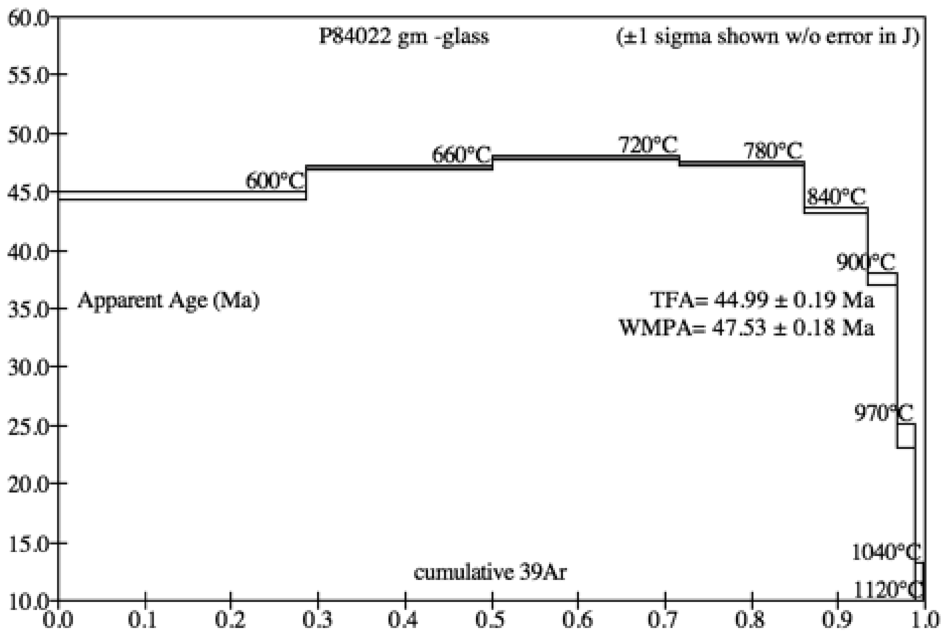
SB67-66. P84022 glass

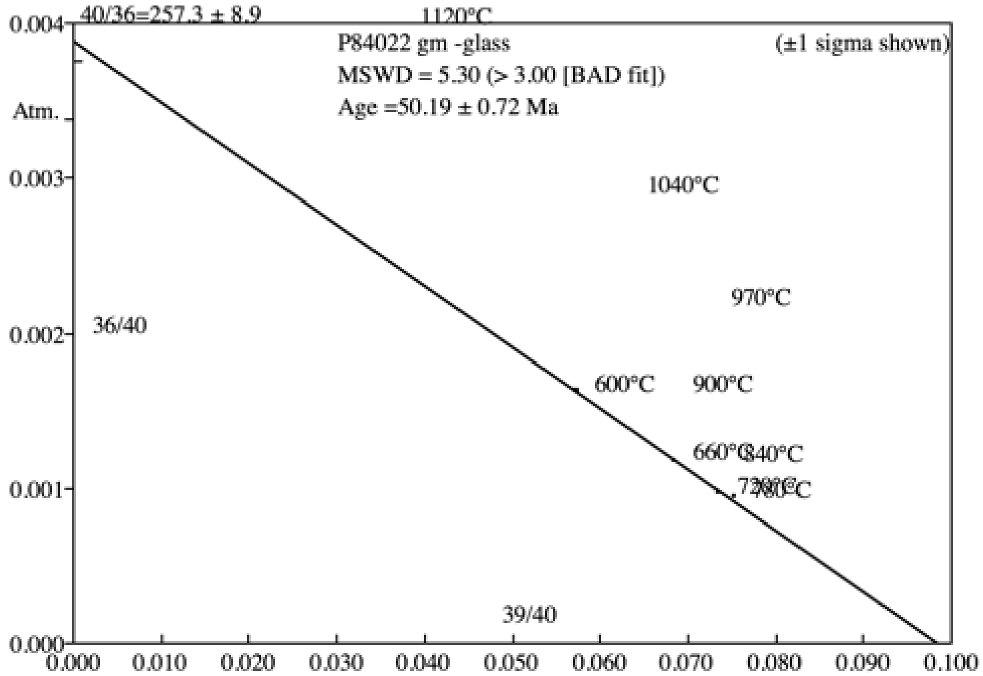
J=0.0027780

T	t	40(mol)	40/39	38/39	37/39	36/39	K/Ca	∑ 39Ar	40Ar*	Age (Ma)
600	14	8.2e-14	17.4947	1.0e-2	0.6082	0.0286	0.81	0.28541	0.516	44.7 ± 0.4
660	14	5.2e-14	14.6358	1.1e-2	0.8296	0.0173	0.59	0.50179	0.650	47.1 ± 0.2
720	14	4.8e-14	13.6308	1.1e-2	1.1770	0.0133	0.42	0.71565	0.712	47.9 ± 0.2
780	14	3.2e-14	13.3190	1.0e-2	1.7881	0.0126	0.27	0.86034	0.720	47.4 ± 0.3
840	14	1.6e-14	13.4696	1.1e-2	2.3922	0.0159	0.20	0.93448	0.651	43.4 ± 0.3
900	14	8.1e-15	14.5999	1.2e-2	2.9041	0.0238	0.17	0.96850	0.519	37.6 ± 0.6
970	14	4.3e-15	13.7233	1.4e-2	4.0822	0.0300	0.12	0.98748	0.354	24.1 ± 1.0
1040	14	2.4e-15	15.8435	2.0e-2	13.3065	0.0461	0.037	0.99688	0.140	11.0 ± 2.2
1120	14	1.3e-15	26.8654	3.7e-2	23.0646	0.1180	0.021	1.00000	-0.298	-40.7 ± 6.1

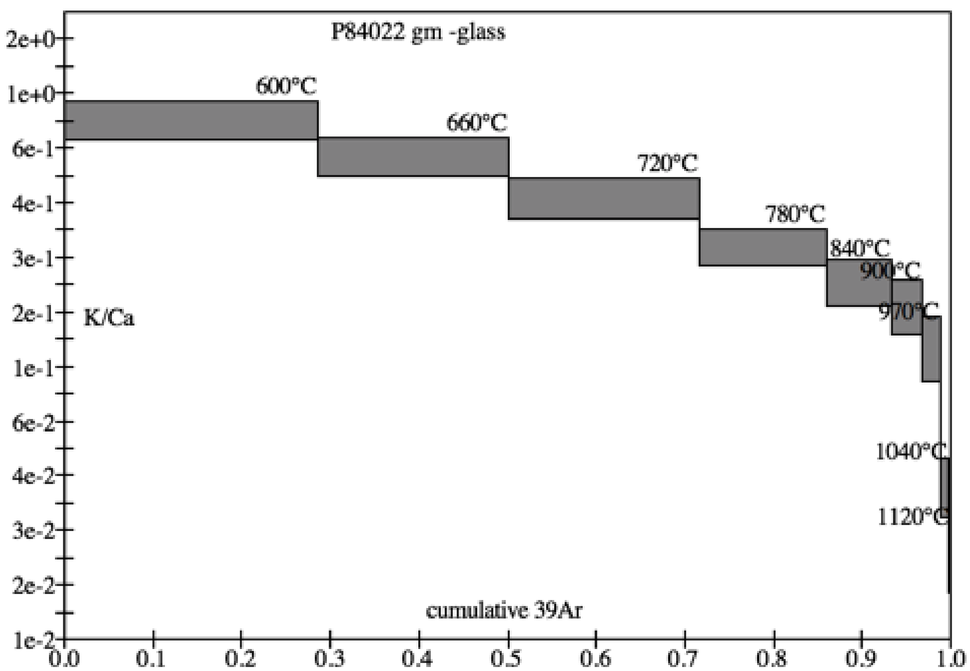
Total fusion age, TFA= 44.99 ± 0.19 Ma (including J)
Weighted mean plateau age, WMPA= 47.53 ± 0.18 Ma (including J)
Inverse isochron age =49.46 ± 1.93 Ma. (MSWD =8.85; 40Ar/36Ar=267.9 ± 27.2)
Steps used: 660, 720, 780, (2–4/9 or 57% ∑ 39Ar)

SB67-66. P84022 glass
Comment: Somewhat bigger split and maybe a little better behaved than SB67-65. Overall very similar to SB67-65. ages climb from 44 to 48 then plummet, a bit of a flat in middle of spectrum, K/Cas range from .02 to 0.8, 51-72% radiogenic. Trust middle part of spectrum the most - Quote WMPA = 47.5 ± 0.18 Ma.





40/36=257.3 ± 8.9
1120°C
P84022 gm -glass
MSWD = 5.30 (> 3.00 [BAD fit])
Age =50.19 ± 0.72 Ma
(±1 sigma shown)
Atm.
1040°C
970°C
36/40
600°C
900°C
660°C
840°C
720°C
780°C
39/40
0.004
0.003
0.002
0.001
0.000
0.000
0.010
0.020
0.030
0.040
0.050
0.060
0.070
0.080
0.090
0.100



P84022 gm -glass
600°C
660°C
720°C
780°C
840°C
900°C
970°C
1040°C
1120°C
K/Ca
cumulative 39Ar
2e+0
1e+0
6e-1
4e-1
3e-1
2e-1
1e-1
6e-2
4e-2
3e-2
2e-2
1e-2
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

SB67-67. P84022 plagioclase

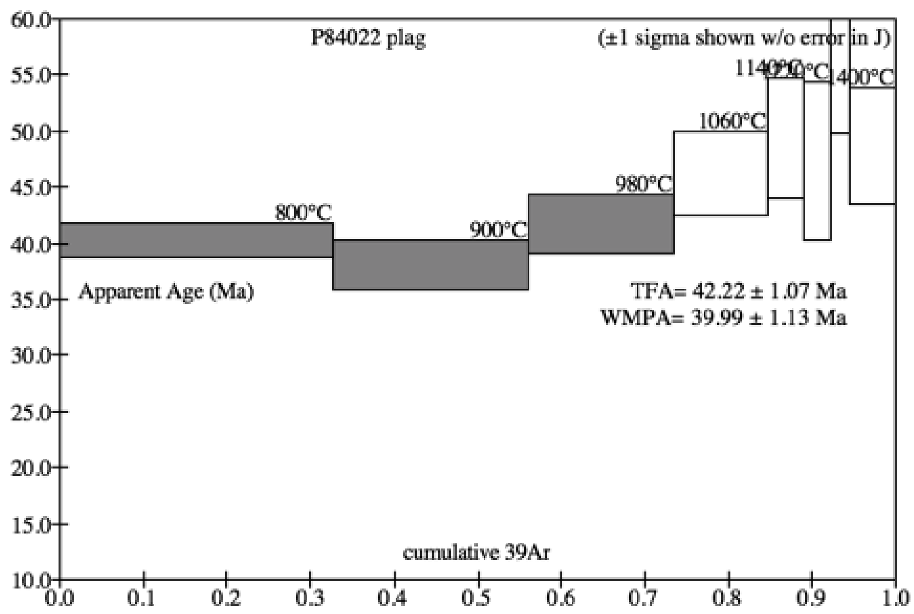
J=0.0027600

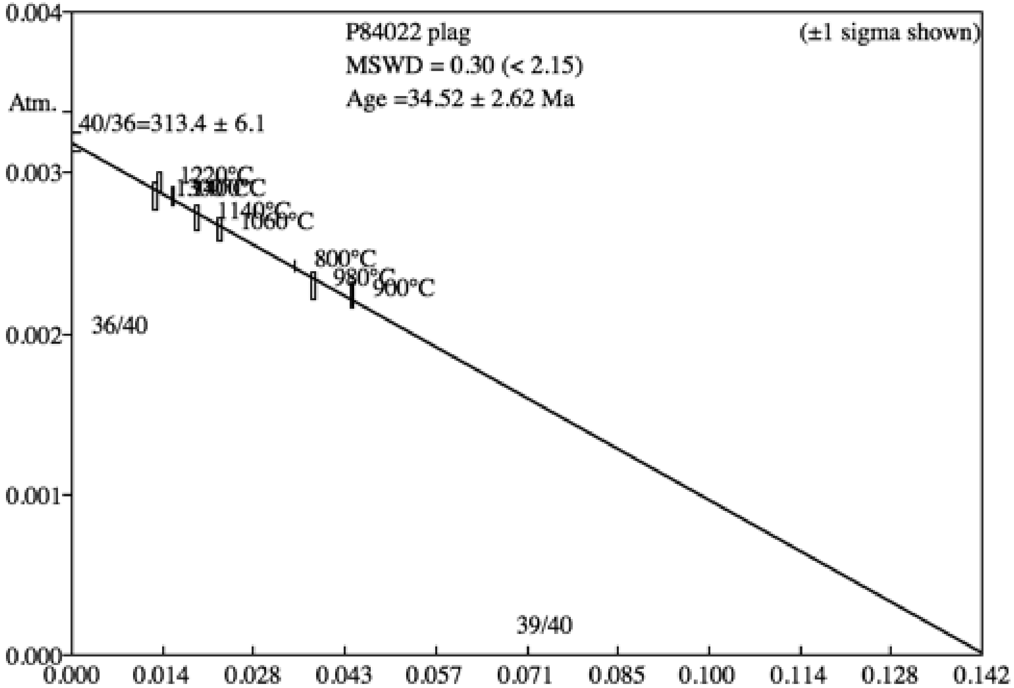
T	t	40(mol)	40/39	38/39	37/39	36/39	K/Ca	∑ 39Ar	40Ar*	Age (Ma)
800	14	1.2e-14	28.7113	1.9e-2	58.0156	0.0694	0.008	0.32651	0.285	40.3 ± 1.5
900	14	6.4e-15	22.8250	4.3e-3	123.7193	0.0510	0.004	0.56079	0.339	38.1 ± 2.2
980	14	5.4e-15	26.5043	3.4e-3	154.1909	0.0610	0.003	0.73409	0.320	41.7 ± 2.7
1060	14	5.9e-15	43.2509	3.4e-3	127.3647	0.1145	0.004	0.84732	0.217	46.2 ± 3.7
1140	14	2.6e-15	51.1434	1.0e-4	112.7335	0.1390	0.004	0.88939	0.197	49.4 ± 5.4
1220	14	2.9e-15	73.1222	3.0e-4	109.3934	0.2149	0.004	0.92184	0.132	47.3 ± 7.0
1300	14	2.2e-15	76.8312	0.0e+0	102.6980	0.2193	0.005	0.94566	0.156	58.9 ± 9.1
1400	14	4.1e-15	63.6370	5.8e-3	133.2792	0.1818	0.004	1.00000	0.156	48.7 ± 5.2

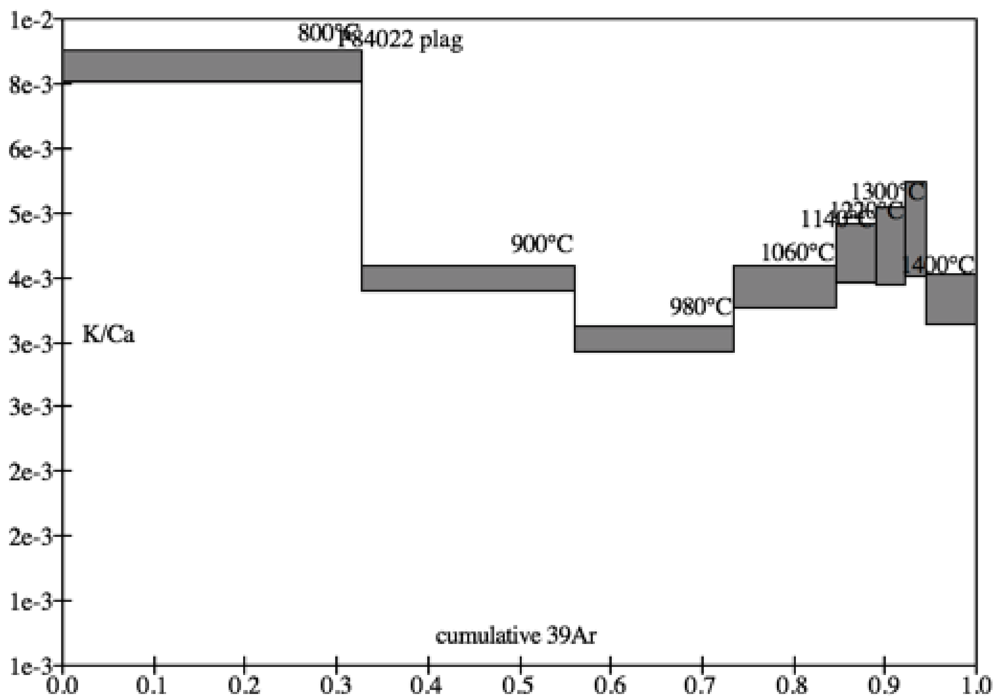
Total fusion age, TFA= 42.22 ± 1.07 Ma (including J)
Weighted mean plateau age, WMPA= 39.99 ± 1.13 Ma (including J)
Inverse isochron age =33.15 ± 10.55 Ma. (MSWD =0.42; 40Ar/36Ar=317.4 ± 22.7)
Steps used: 800, 900, 980, (1–3/8 or 73% ∑ 39Ar)

SB67-67. P84022 plagioclase
Comment: Biggest problem here was how little sample there was to work with (only a few mg) so signals were tiny. But pretty well behaved flattish spectrum, with most steps within error. K/Cas are quite low (.003-.004) as are radiogenic yields. TFA = 42.2 Ma. WMPA from first 3 steps (73% of gas) is 40.0 ± 1.1 Ma

Overall comment on sample P84022 (three dated fractions): Everything points toward P84022 being old (>40 Ma). The glass ages have higher apparent precision, but are more suspect in terms of the material - especially the tendency for glass in submarine settings to trap a non atmospheric (excess argon) component and thus give spuriously old ages. The plag is very low K/Ca, and tiny signals, but seems pretty solid. Taken together and considering the analytical and other uncertainties, it could probably be concluded that in reality all these ages are in rough agreement and an age of something like 42 ± 2.5 Ma should be reported as the age of the sample.




P84022 plag
MSWD = 0.30 (< 2.15)
Age =34.52 ± 2.62 Ma
(±1 sigma shown)
Atm.
40/36=313.4 ± 6.1
1220°C
1140°C
1060°C
800°C
980°C
900°C
36/40
39/40
0.004
0.003
0.002
0.001
0.000
0.000
0.014
0.028
0.043
0.057
0.071
0.085
0.100
0.114
0.128
0.142


P84022 plag
800°C
900°C
980°C
1060°C
1140°C
1220°C
1300°C
1400°C
K/Ca
cumulative 39Ar
1e-2
8e-3
6e-3
5e-3
4e-3
3e-3
3e-3
2e-3
2e-3
1e-3
1e-3
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0