

**Supplementary Material:** **$^{40}\text{Ar}/^{39}\text{Ar}$  dating**

The bulk tuff samples were crushed, disintegrated in a dilute calgon solution, washed and sieved over a set of sieves between 63 and 250  $\mu\text{m}$ . The largest appropriate mineral fractions were subjected to standard heavy liquid and magnetic separation techniques for sanidine, biotite and hornblende. None of the samples contained sanidine. WT-1 provided hornblende in the fraction larger than 250  $\mu\text{m}$ , while WT-3 supplied biotite larger than 100  $\mu\text{m}$ . The resulting separates were submerged in pure demineralized water in an ultrasonic bath during 5 min. Both samples were subsequently handpicked. Then they were loaded in a 10mm ID quartz vial together with Fish Canyon Tuff (FC-2) and Drachenfels (Dra-1, f250-500 and Dra-2, f>500) sanidine serving as flux monitors. The vial was irradiated in the Oregon State University TRIGA reactor in the cadmium shielded CLICIT facility for 10 hours.

Subsequently, the separates were split in two duplicate fractions loaded in 6mm holes of a Cu-tray and pre-heated to  $\sim 200^\circ\text{C}$  under vacuum using a heating stage and a heat lamp to remove undesirable atmospheric argon. The tray was then placed in the sample house and the system (extraction line + sample house) was degassed overnight at  $\sim 150^\circ\text{C}$ . Incremental heating was performed with a Synrad CO<sub>2</sub> laser in combination with a Raylase scanhead as a beam delivery and beam diffuser system. After purification the resulting gas was analyzed with a Mass Analyzer Products LTD 215-50 noble gas mass spectrometer. Beam intensities were measured in a peak-jumping mode in 0.5 mass intervals over the mass range 40–35.5 on

a Balzers 217 secondary electron multiplier. System blanks were measured every three to four steps. Mass discrimination was monitored by frequent analysis (~every 10 hours) of aliquots of air. The irradiation parameter J for each unknown was determined by interpolation using a linear fit between the individually measured standards.  $^{40}\text{Ar}/^{39}\text{Ar}$  ages were calculated with the ArArCalc software (Koppers 2002) using the decay constants of Steiger and Jäger (1977). The recently astronomically calibrated age for Fish Canyon Tuff sanidine flux monitor used in age calculations is  $28.201 \pm 0.03$  My (Kuiper et al. 2008). The age for the Drachenfels sanidine flux monitor is  $25.42 \pm 0.03$  My (Kuiper et al., in prep). Correction factors for neutron interference reactions are  $2.64 \pm 0.017 \times 10^{-4}$  for  $(^{36}\text{Ar}/^{37}\text{Ar})_{\text{Ca}}$ ,  $6.73 \pm 0.037 \times 10^{-4}$  for  $(^{39}\text{Ar}/^{37}\text{Ar})_{\text{Ca}}$ ,  $1.211 \pm 0.003 \times 10^{-2}$  for  $(^{38}\text{Ar}/^{39}\text{Ar})_{\text{K}}$  and  $8.6 \pm 0.7 \times 10^{-4}$  for  $(^{40}\text{Ar}/^{39}\text{Ar})_{\text{K}}$ . We used the value of 295.5 for the  $^{40}\text{Ar}/^{36}\text{Ar}$  atmospheric ratio (Nier, 1950). Errors are quoted at the  $1\sigma$  level and include the analytical error and the error in J.

The results of the incremental heating experiments are displayed as age spectra diagrams (figure 2 and A1). An age is accepted as an accurate estimate of the crystallization age when the criteria described in Kuiper et al. (2006) are met.

For WT-3, ten total fusion analyses of multigrain biotite separates yielded a weighted mean age of  $13.86 \pm 0.03$  Ma ( $n=8/10$ , MSWD 0.43). The average radiogenic  $^{40}\text{Ar}^*$  was ~85%. Based on the good reproducibility and for unaltered biotite slightly low  $^{40}\text{Ar}^*$  we decided to perform incremental heating experiments. Steps yielding less than 1% of the total  $^{39}\text{Ar}_{\text{K}}$  were immediately discarded. Steps included in the plateau all contained >90% radiogenic argon. Steps were included in the plateau until MSWD < statistical T ratio at the 2 sigma level. This yielded plateau ages for WT-3 of  $13.58 \pm 0.01$  Ma (MSWD 0.75) and  $13.61 \pm 0.02$  Ma (MSWD 0.70, both 1 sigma analytical errors). The  $^{40}\text{Ar}/^{36}\text{Ar}$  inverse isochron intercepts were

respectively  $335 \pm 36$  and  $369 \pm 75$  (1 sigma). The intercept errors are relatively large due to clustering of the data points, but do not show significant amounts of excess argon. Therefore we concluded that the weighted mean plateau age of  $13.60 \pm 0.01$  Ma (1 sigma analytical error), represents the crystallization age of the WT-3 biotite. The error increases to  $\pm 0.07$  Ma when uncertainties in the determined J-value and in the age of the astronomically calibrated standard and the decay constants, as reported in Kuiper et al. (2008) and Steiger and Jäger (1977) respectively, are included. It should be noted that recoil of  $^{39}\text{Ar}$  can lead to slight overestimation of the  $^{40}\text{Ar}/^{39}\text{Ar}$  age of thin slightly altered biotite crystals. However, since in this case the amount of radiogenic argon in the samples is high, potential displacement of a slight amount of  $^{39}\text{Ar}$ , is expected to have little to no effect on the determined age of WT-3.

For WT-1, five total fusion analyses of multigrain hornblende separates yielded a weighted mean age of  $13.8 \pm 0.3$  Ma ( $n=5/5$ , MSWD 16). The average radiogenic  $^{40}\text{Ar}^*$  was  $\sim 73\%$ . We decided to perform a duplicate incremental heating experiment to try to reduce the non radiogenic  $^{40}\text{Ar}^*$  component and to assess the effect of potential excess argon. Steps yielding less than 1% of the total  $^{39}\text{Ar}_K$  were immediately discarded. Experiments 09M243N and 09M243O were slightly disturbed: regression lines of especially  $^{40}\text{Ar}$  were very irregular and we had to omit 6-8 of the 12 cycles. Steps included in the plateau all contain  $>80\%$  radiogenic argon. This yielded plateau ages for WT-1 of  $13.83 \pm 0.04$  Ma (MSWD 0.51) and  $13.78 \pm 0.04$  Ma (MSWD 0.72, both 1 sigma analytical errors). The  $^{40}\text{Ar}/^{36}\text{Ar}$  inverse isochron intercepts were respectively  $297 \pm 16$  and  $323 \pm 14$  (1 sigma) and do not point at serious amounts of excess argon. Therefore we concluded that the weighted mean plateau age of  $13.81 \pm 0.03$  Ma (1 sigma analytical error), represents the crystallization age of the WT-1 hornblende. The error increases to  $\pm 0.08$  Ma when uncertainties in the determined J-value

and in the age of the astronomically calibrated standard and the decay constants, as reported in Kuiper et al. (2008) and Steiger and Jäger (1977) respectively, are included.

To estimate the age difference between WT-1 and WT-3 we only have to take into account the analytical errors. Since both samples are co-irradiated side by side and analysed consecutively using the same analytical set-up, we can neglect uncertainties related to the age of the standard and decay constants.

To estimate the absolute age of WT-1 and WT-3 required for correlation to the Geological Time Scale we do need to incorporate all sources of uncertainty and therefore arrive at a larger error.

#### Supplementary Material References:

Koppers, A.A.P., 2002, ArArCALC—software for  $^{40}\text{Ar}/^{39}\text{Ar}$  age calculations: Computers and Geosciences, v. 28, no. 5, p. 605-619.

Kuiper, K.F., Krijgsman, W., Garcés, M., and Wijbrans, J.R., 2006, Revised isotopic ( $^{40}\text{Ar}/^{39}\text{Ar}$ ) age for the lamproite volcano of Cabezos Negros, Fortuna Basin (Eastern Betics, SE Spain): Palaeogeography, Palaeoclimatology, Palaeoecology, v. 238, no. 1-4, p. 53-63.

Nier, A.O. 1950, A Redetermination of the Relative Abundances of the Isotopes of Neon, Krypton, Rubidium, Xenon, and Mercury: Phys. Rev. 79, P 450 – 454.

Steiger, R.H., and Jäger, E., 1977, Subcommission on geochronology: convention on the use of decay constants in geo-and cosmochronology: Earth and planetary science letters, v. 36, no. 3, p. 359-362.

#### Supplementary Material Figure Captions:

Figure DR1: Age spectra diagrams for the WT-1 (a,b) and WT-3 (c,d) tuff layers with the chosen plateaus and their weighted ages. Duplicate measurements were performed for each of the two tuffs. The final age of WT-1 as well as WT-3 was calculated on

the basis of the combined weighted plateaus (figure 2) of the here depicted duplicate measurements. The uncertainty includes the analytical error (for individual steps) as well as external uncertainties (for weighted mean age). The full analytical data can be found in the supplementary information.

Table 1: Summary of the  $^{40}\text{Ar}/^{39}\text{Ar}$  results. MSWD is Mean Square Weighted Deviates, N is the total number of steps taken in the incremental heating experiments. In brackets the number of experiments used to calculate the weighted mean age.  $^{39}\text{Ar}_K$  is the percentage of  $^{39}\text{Ar}_K$  released by plateau steps.  $^{40}\text{Ar}^*$  is the radiogenic amount of  $^{40}\text{Ar}$ . Errors are given at 1 sigma level. MSWD,  $^{40}\text{Ar}^*$  (%),  $^{39}\text{Ar}_K$  (%), K/Ca, and inverse isochron intercept were determined based on the experiments selected for calculation of the weighted mean age.

Table DR1: Full analytical data for WT-1 Experiment 1

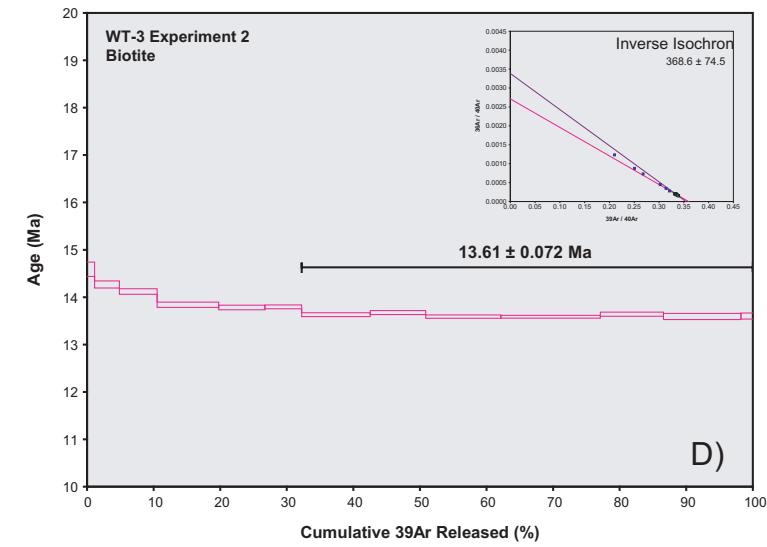
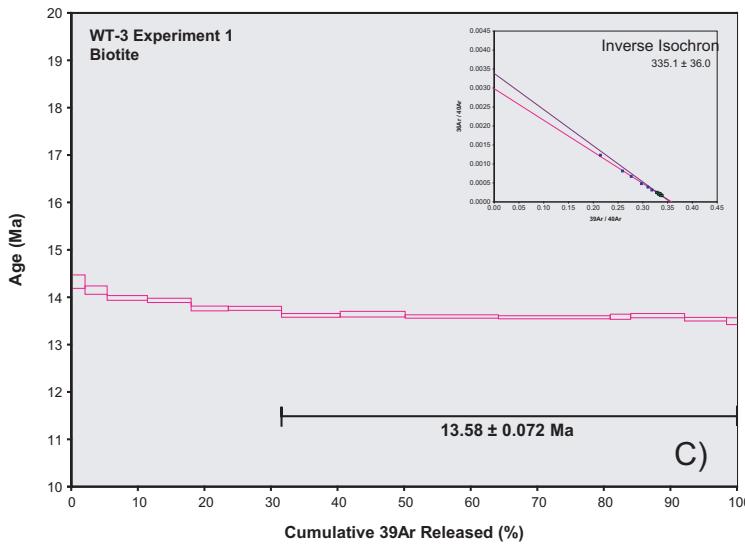
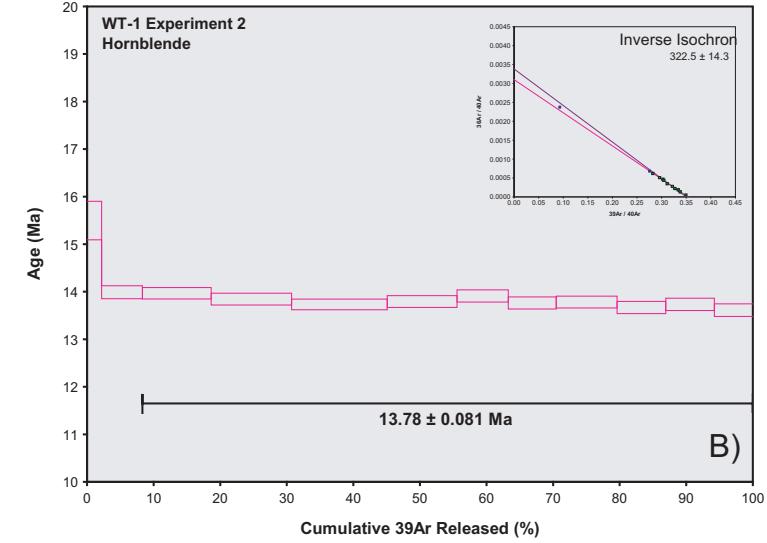
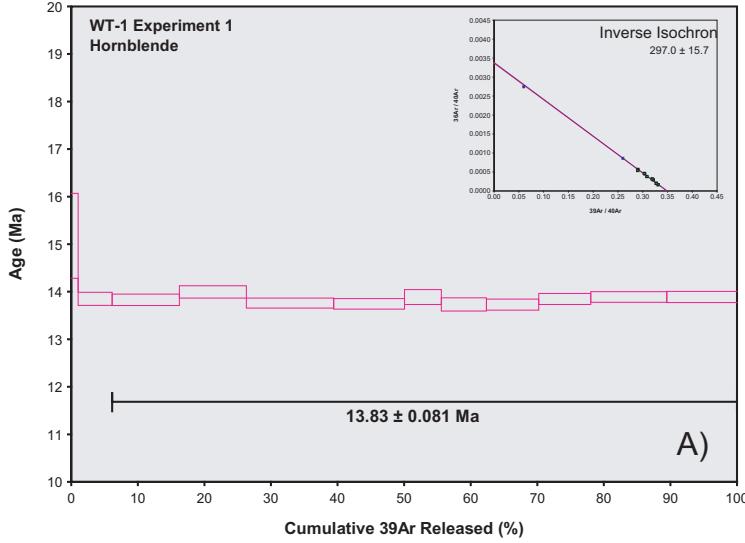
Table DR2: Full analytical data for WT-1 Experiment 2

Table DR3: Full analytical data for the WT-1 experiments combined

Table DR4: Full analytical data for WT-3 Experiment 1

Table DR5: Full analytical data for WT-3 Experiment 1

Table DR6: Full analytical data for the WT-3 experiments combined



**Table DR1.**

Incremental Heating		36Ar(a)	37Ar(ca)	38Ar(cl)	39Ar(k)	40Ar(r)	Age $\pm 1\sigma$ (Ma)	40Ar(r) (%)	39Ar(k) (%)	K/Ca $\pm 1\sigma$	
09M0243A	0.75 W	0.001139	0.000000	0.000000	0.000022	0.011177	1551.32 $\pm$ 2721.55	3.21			
09M0243B	1.25 W	0.001885	0.000177	0.000137	0.000061	0.000000	0.00 $\pm$ 0.00	0.00		0.148 $\pm$ 0.405	
09M0243D	1.85 W	0.001775	0.001895	0.000000	0.000457	0.005846	60.93 $\pm$ 90.06	1.10		0.104 $\pm$ 0.037	
09M0243E	2.20 W	0.002029	0.004026	0.000000	0.000670	0.017937	125.22 $\pm$ 69.36	2.90		0.072 $\pm$ 0.011	
09M0243H	3.50 W	0.004240	0.579878	0.000834	0.092483	0.290983	15.18 $\pm$ 0.89	18.85	1.03	0.069 $\pm$ 0.003	
09M0243I	4.50 W	0.001518	2.838257	0.004385	0.459096	1.317803	13.85 $\pm$ 0.14	74.58	5.11	0.070 $\pm$ 0.003	
09M0243J	5.50 W	x	0.001774	5.521852	0.008392	0.907600	2.601438	13.83 $\pm$ 0.12	83.21	10.10	0.071 $\pm$ 0.003
09M0243K	6.50 W	x	0.001678	5.637068	0.008610	0.904469	2.623843	14.00 $\pm$ 0.13	84.08	10.06	0.069 $\pm$ 0.003
09M0243L	7.50 W	x	0.001744	7.151591	0.009698	1.179502	3.363619	13.76 $\pm$ 0.11	86.69	13.12	0.071 $\pm$ 0.003
09M0243M	8.50 W	x	0.001457	5.758227	0.007736	0.954940	2.720125	13.74 $\pm$ 0.11	86.31	10.63	0.071 $\pm$ 0.003
09M0243N	8.50 W	x	0.000610	2.987292	0.003493	0.496860	1.430044	13.89 $\pm$ 0.16	88.79	5.53	0.072 $\pm$ 0.003
09M0243O	9.50 W	x	0.000551	3.667836	0.004346	0.609659	1.735086	13.73 $\pm$ 0.14	91.40	6.78	0.071 $\pm$ 0.003
09M0243P	10.50 W	x	0.000698	4.241638	0.005805	0.705948	2.008465	13.73 $\pm$ 0.12	90.66	7.86	0.072 $\pm$ 0.003
09M0243Q	12.00 W	x	0.000436	4.252459	0.005488	0.701943	2.014566	13.85 $\pm$ 0.12	93.97	7.81	0.071 $\pm$ 0.003
09M0243R	15.00 W	x	0.000500	6.206906	0.007939	1.027278	2.957093	13.89 $\pm$ 0.11	95.21	11.43	0.071 $\pm$ 0.003
09M0243S	20.00 W	x	0.000568	5.769296	0.007530	0.946981	2.726061	13.89 $\pm$ 0.12	94.17	10.54	0.071 $\pm$ 0.003
$\Sigma$		0.015774	54.612300	0.074255	8.986758	25.789126					
Information on Analysis		Results	40(r)/39(k) $\pm 1\sigma$		Age $\pm 1\sigma$ (Ma)	MSWD	39Ar(k) (%,n)	K/Ca $\pm 1\sigma$			
VU78-36 Hornblende		Weighted Plateau	2.8653 $\pm$ 0.0079 $\pm$ 0.28%		13.83 $\pm$ 0.08 $\pm$ 0.57%	0.51	93.86 10	0.071 $\pm$ 0.001			
WT1 AL					External Error $\pm$ 0.16	0.99	Statistical T Ratio				
Project = VU78		Total Fusion Age	2.8697 $\pm$ 0.0079		13.85 $\pm$ 0.08	1.2	n nnn + n nnn				

Irradiation = VU78	Total Dose (Mrads)	$2.0000 \pm 0.0000$	Total Dose Range	$1.9977 \pm 0.0027\%$	Total Dose Range	$1.9950 \pm 0.0057\%$	14	14	$0.0002 \pm 0.0000$
J = $0.0026848 \pm 0.0000134$				External Error $\pm 0.16$					
Dra = $25.420 \pm 0.145$ Ma				Analytical Error $\pm 0.04$					

Additional Parameters		40(r)/39(k)	1σ	40(r+a)	1σ	40Ar/39Ar	1σ	37Ar/39Ar	1σ	36Ar/39Ar	1σ	37Ar (decay)	39Ar (decay)	40Ar (moles)	
09M0243H	3.50 W	3.146335	0.18599	1.54380	0.00342	16.62354	0.09759	6.24375	0.23979	0.04730	0.00066	42.21893758	1.00133798	5.095E-18	
09M0243I	4.50 W	2.870432	0.02871	1.76651	0.00175	3.83272	0.00980	6.15666	0.23621	0.00492	0.00007	42.80672764	1.00134292	5.831E-18	
09M0243J	5.50 W	x	2.866282	0.02481	3.12570	0.00545	3.43073	0.01154	6.05920	0.23127	0.00355	0.00005	42.95671703	1.00134417	1.032E-17
09M0243K	6.50 W	x	2.900977	0.02698	3.11971	0.01030	3.43567	0.01801	6.20643	0.23716	0.00349	0.00004	43.11373662	1.00134548	1.030E-17
09M0243L	7.50 W	x	2.851728	0.02193	3.87895	0.00306	3.27612	0.00759	6.03859	0.23064	0.00307	0.00004	43.66065172	1.00134999	1.280E-17
09M0243M	8.50 W	x	2.848477	0.02322	3.15058	0.00284	3.28677	0.00851	6.00556	0.22923	0.00310	0.00004	43.81363315	1.00135124	1.040E-17
09M0243N	8.50 W	x	2.878165	0.03245	1.61021	0.00274	3.22861	0.01431	5.98811	0.22794	0.00280	0.00006	43.96835680	1.00135250	5.315E-18
09M0243O	9.50 W	x	2.845996	0.02904	1.89786	0.00297	3.10132	0.00852	5.99195	0.22812	0.00248	0.00004	44.77476927	1.00135900	6.265E-18
09M0243P	10.50 W	x	2.845060	0.02407	2.21485	0.00274	3.12563	0.00800	5.98423	0.22997	0.00257	0.00005	45.54159245	1.00136507	7.311E-18
09M0243Q	12.00 W	x	2.869985	0.02423	2.14333	0.00374	3.04188	0.01034	6.03353	0.23266	0.00221	0.00004	45.73377321	1.00136658	7.075E-18
09M0243R	15.00 W	x	2.878571	0.02341	3.10493	0.00542	3.01110	0.00985	6.01762	0.23455	0.00207	0.00004	46.48130296	1.00137238	1.025E-17
09M0243S	20.00 W	x	2.878686	0.02431	2.89388	0.00397	3.04428	0.00791	6.06743	0.23691	0.00220	0.00005	47.28513513	1.00137851	9.553E-18

**Table DR2.**

Incremental Heating		36Ar(a)	37Ar(ca)	38Ar(cl)	39Ar(k)	40Ar(r)	Age $\pm 1\sigma$ (Ma)	40Ar(r) (%)	39Ar(k) (%)	K/Ca $\pm 1\sigma$
09M0244A	0.75 W	0.001107	0.000000	0.000047	0.000000	0.003092	0.00 $\pm$ 0.00	0.94		
09M0244B	1.25 W	0.001688	0.000000	0.000036	0.000057	0.002124	172.49 $\pm$ 663.62	0.42		
09M0244D	1.85 W	0.002357	0.001596	0.000000	0.000523	0.001356	12.52 $\pm$ 101.74	0.19	0.141 $\pm$ 0.052	
09M0244E	2.20 W	0.002500	0.004867	0.000000	0.000754	0.008114	51.41 $\pm$ 77.87	1.09	0.067 $\pm$ 0.011	
09M0244F	2.60 W	0.002489	0.012678	0.000000	0.002301	0.016093	33.57 $\pm$ 28.20	2.14	0.078 $\pm$ 0.006	
09M0244H	3.50 W	0.004624	1.076307	0.001596	0.181045	0.581758	15.50 $\pm$ 0.41	29.86	2.20	0.072 $\pm$ 0.003
09M0244I	4.50 W	0.001249	3.052261	0.004731	0.504597	1.462999	13.99 $\pm$ 0.14	79.84	6.12	0.071 $\pm$ 0.003
09M0244J	5.50 W	x	0.001869	5.186611	0.007459	0.852027	2.466538	13.97 $\pm$ 0.12	81.69	10.33
09M0244K	6.50 W	x	0.001715	6.075119	0.008306	0.995441	2.856359	13.85 $\pm$ 0.12	84.91	12.07
09M0244L	7.50 W	x	0.001833	7.214002	0.010249	1.184336	3.370543	13.73 $\pm$ 0.11	86.13	14.36
09M0244M	8.50 W	x	0.001239	5.254833	0.007027	0.865156	2.472968	13.79 $\pm$ 0.12	87.08	10.49
09M0244N	8.60 W	x	0.000710	3.857792	0.005086	0.634957	1.830529	13.91 $\pm$ 0.13	89.70	7.70
09M0244O	9.50 W	x	0.000512	3.561321	0.004530	0.594880	1.696824	13.76 $\pm$ 0.13	91.79	7.21
09M0244P	10.50 W	x	0.000510	4.660439	0.006475	0.752823	2.150490	13.78 $\pm$ 0.12	93.42	9.13
09M0244Q	12.00 W	x	0.000336	3.659670	0.004632	0.603570	1.709555	13.67 $\pm$ 0.13	94.48	7.32
09M0244R	15.00 W	x	0.000237	3.637625	0.004890	0.601525	1.712158	13.73 $\pm$ 0.13	96.05	7.29
09M0244S	20.00 W	x	0.000065	2.882967	0.003584	0.476825	1.345140	13.61 $\pm$ 0.13	98.55	5.78
$\Sigma$		0.014899	50.118947	0.068566	8.247181	23.655861				
Information on Analysis		Results	40(r)/39(k) $\pm 1\sigma$			Age $\pm 1\sigma$ (Ma)	MSWD	39Ar(k) (%,n)	K/Ca $\pm 1\sigma$	
VU78-36 Hornblende		Weighted Plateau	$2.8566 \pm 0.0082$ $\pm 0.29\%$			$13.78 \pm 0.08$ $\pm 0.57\%$	0.72	91.69 10	0.071 $\pm$ 0.001	
WT1						External Error $\pm 0.16$	0.99	Statistical T Ratio		
AL						Analytical Error $\pm 0.04$	1.0000	Error Magnification		

Project = VU78	Total Fusion Age	$2.8684 \pm 0.0081$ $\pm 0.28\%$	$13.84 \pm 0.08$ $\pm 0.57\%$	12	$0.002 \pm 0.000$
Irradiation = VU78			External Error $\pm 0.16$		
J = $0.0026848 \pm 0.0000134$			Analytical Error $\pm 0.04$		
Dra = $25.420 \pm 0.145$ Ma					

Additional Parameters		40(r)/39(k)	1σ	40(r+a)	1σ	40Ar/39Ar	1σ	37Ar/39Ar	1σ	36Ar/39Ar	1σ	37Ar (decay)	39Ar (decay)	40Ar (moles)	
09M0244H	3.50 W	3.213332	0.08446	1.94805	0.00650	10.71799	0.05169	5.92128	0.22578	0.02700	0.00027	42.24790266	1.00133822	6.429E-18	
09M0244I	4.50 W	2.899344	0.02838	1.83206	0.00103	3.61688	0.00945	6.02439	0.22877	0.00406	0.00007	42.83609599	1.00134317	6.047E-18	
09M0244J	5.50 W	x	2.894906	0.02490	3.01879	0.00311	3.52947	0.00883	6.06254	0.23156	0.00379	0.00005	42.98677792	1.00134442	9.964E-18
09M0244K	6.50 W	x	2.869439	0.02585	3.36315	0.00721	3.36559	0.01342	6.07798	0.23220	0.00332	0.00005	43.14331560	1.00134572	1.110E-17
09M0244L	7.50 W	x	2.845936	0.02343	3.91219	0.00462	3.29065	0.00846	6.06631	0.23193	0.00314	0.00004	43.69060592	1.00135023	1.291E-17
09M0244M	8.50 W	x	2.858406	0.02587	2.83906	0.00312	3.26905	0.00880	6.04913	0.23169	0.00302	0.00006	43.84369231	1.00135148	9.371E-18
09M0244N	8.60 W	x	2.882921	0.02673	2.04028	0.00395	3.20103	0.01073	6.05094	0.23051	0.00271	0.00006	43.99912562	1.00135275	6.735E-18
09M0244O	9.50 W	x	2.852382	0.02662	1.84807	0.00547	3.09502	0.01365	5.96260	0.22866	0.00243	0.00005	44.80548783	1.00135925	6.100E-18
09M0244P	10.50 W	x	2.856567	0.02584	2.30134	0.00273	3.04512	0.00989	6.16493	0.23812	0.00230	0.00005	45.57283710	1.00136532	7.597E-18
09M0244Q	12.00 W	x	2.832408	0.02677	1.80893	0.00542	2.98572	0.01244	6.03874	0.23279	0.00215	0.00005	45.76577746	1.00136683	5.971E-18
09M0244R	15.00 W	x	2.846363	0.02687	1.78210	0.00529	2.95148	0.01135	6.02283	0.23395	0.00198	0.00005	46.51319232	1.00137263	5.883E-18
09M0244S	20.00 W	x	2.821032	0.02757	1.36449	0.00236	2.85086	0.00828	6.02167	0.23337	0.00173	0.00006	47.31822501	1.00137876	4.504E-18

**Table DR3**

Incremental Heating		36Ar(a)	37Ar(ca)	38Ar(cl)	39Ar(k)	40Ar(r)	Age $\pm 1\sigma$ (Ma)	40Ar(r) (%)	39Ar(k) (%)	K/Ca $\pm 1\sigma$	
09M0243H	3.50 W	0.004240	0.579878	0.000834	0.092483	0.290983	15.18 $\pm$ 0.89	18.85	0.54	0.069 $\pm$ 0.003	
09M0243I	4.50 W	0.001518	2.838257	0.004385	0.459096	1.317803	13.85 $\pm$ 0.14	74.58	2.66	0.070 $\pm$ 0.003	
09M0243J	5.50 W	x	0.001774	5.521852	0.008392	0.907600	2.601438	13.83 $\pm$ 0.12	83.21	5.27	0.071 $\pm$ 0.003
09M0243K	6.50 W	x	0.001678	5.637068	0.008610	0.904469	2.623843	14.00 $\pm$ 0.13	84.08	5.25	0.069 $\pm$ 0.003
09M0243L	7.50 W	x	0.001744	7.151591	0.009698	1.179502	3.363619	13.76 $\pm$ 0.11	86.69	6.84	0.071 $\pm$ 0.003
09M0243M	8.50 W	x	0.001457	5.758227	0.007736	0.954940	2.720125	13.74 $\pm$ 0.11	86.31	5.54	0.071 $\pm$ 0.003
09M0243N	8.50 W	x	0.000610	2.987292	0.003493	0.496860	1.430044	13.89 $\pm$ 0.16	88.79	2.88	0.072 $\pm$ 0.003
09M0243O	9.50 W	x	0.000551	3.667836	0.004346	0.609659	1.735086	13.73 $\pm$ 0.14	91.40	3.54	0.071 $\pm$ 0.003
09M0243P	10.50 W	x	0.000698	4.241638	0.005805	0.705948	2.008465	13.73 $\pm$ 0.12	90.66	4.10	0.072 $\pm$ 0.003
09M0243Q	12.00 W	x	0.000436	4.252459	0.005488	0.701943	2.014566	13.85 $\pm$ 0.12	93.97	4.07	0.071 $\pm$ 0.003
09M0243R	15.00 W	x	0.000500	6.206906	0.007939	1.027278	2.957093	13.89 $\pm$ 0.11	95.21	5.96	0.071 $\pm$ 0.003
09M0243S	20.00 W	x	0.000568	5.769296	0.007530	0.946981	2.726061	13.89 $\pm$ 0.12	94.17	5.49	0.071 $\pm$ 0.003
09M0244H	3.50 W		0.004624	1.076307	0.001596	0.181045	0.581758	15.50 $\pm$ 0.41	29.86	1.05	0.072 $\pm$ 0.003
09M0244I	4.50 W		0.001249	3.052261	0.004731	0.504597	1.462999	13.99 $\pm$ 0.14	79.84	2.93	0.071 $\pm$ 0.003
09M0244J	5.50 W	x	0.001869	5.186611	0.007459	0.852027	2.466538	13.97 $\pm$ 0.12	81.69	4.94	0.071 $\pm$ 0.003
09M0244K	6.50 W	x	0.001715	6.075119	0.008306	0.995441	2.856359	13.85 $\pm$ 0.12	84.91	5.78	0.070 $\pm$ 0.003
09M0244L	7.50 W	x	0.001833	7.214002	0.010249	1.184336	3.370543	13.73 $\pm$ 0.11	86.13	6.87	0.071 $\pm$ 0.003
09M0244M	8.50 W	x	0.001239	5.254833	0.007027	0.865156	2.472968	13.79 $\pm$ 0.12	87.08	5.02	0.071 $\pm$ 0.003
09M0244N	8.60 W	x	0.000710	3.857792	0.005086	0.634957	1.830529	13.91 $\pm$ 0.13	89.70	3.68	0.071 $\pm$ 0.003
09M0244O	9.50 W	x	0.000512	3.561321	0.004530	0.594880	1.696824	13.76 $\pm$ 0.13	91.79	3.45	0.072 $\pm$ 0.003
09M0244P	10.50 W	x	0.000510	4.660439	0.006475	0.752823	2.150490	13.78 $\pm$ 0.12	93.42	4.37	0.069 $\pm$ 0.003
09M0244Q	12.00 W	x	0.000336	3.659670	0.004632	0.603570	1.709555	13.67 $\pm$ 0.13	94.48	3.50	0.071 $\pm$ 0.003
09M0244R	15.00 W	x	0.000237	3.637625	0.004890	0.601525	1.712158	13.73 $\pm$ 0.13	96.05	3.49	0.071 $\pm$ 0.003
09M0244S	20.00 W	x	0.000065	2.882967	0.003584	0.476825	1.345140	13.61 $\pm$ 0.13	98.55	2.77	0.071 $\pm$ 0.003
		$\Sigma$	0.030673	104.731247	0.142821	17.233939	49.444987				
Information on Analysis		Results		40(r)/39(k) $\pm 1\sigma$		Age $\pm 1\sigma$ (Ma)	MSWD	39Ar(k) (%,n)	K/Ca $\pm 1\sigma$		

VU78-36							
Hornblende	<b>Weighted Plateau</b>	2.8611	$\pm 0.0057$ $\pm 0.20\%$	13.81	$\pm 0.07$ $\pm 0.54\%$	0.61	92.82 20
WT1				External Error	$\pm 0.16$	0.96	Statistical T Ratio
AL				Analytical Error	$\pm 0.03$	1.0000	Error Magnification
Project = VU78							
Irradiation = VU78	<b>Total Fusion Age</b>	2.8690	$\pm 0.0056$ $\pm 0.20\%$	13.84	$\pm 0.07$ $\pm 0.54\%$	24	0.002 $\pm 0.000$
J = 0.0026848 $\pm 0.0000134$				External Error	$\pm 0.16$		
Dra = 25.420 $\pm 0.145$ Ma				Analytical Error	$\pm 0.03$		

Additional Parameters		40(r)/39(k)	1σ	40(r+a)	1σ	40Ar/39Ar	1σ	37Ar/39Ar	1σ	36Ar/39Ar	1σ	37Ar (decay)	39Ar (decay)	40Ar (moles)	
09M0243H	3.50 W	3.146335	0.18599	1.54380	0.00342	16.62354	0.09759	6.24375	0.23979	0.04730	0.00066	42.21893758	1.00133798	5.095E-18	
09M0243I	4.50 W	2.870432	0.02871	1.76651	0.00175	3.83272	0.00980	6.15666	0.23621	0.00492	0.00007	42.80672764	1.00134292	5.831E-18	
09M0243J	5.50 W	x	2.866282	0.02481	3.12570	0.00545	3.43073	0.01154	6.05920	0.23127	0.00355	0.00005	42.95671703	1.00134417	1.032E-17
09M0243K	6.50 W	x	2.900977	0.02698	3.11971	0.01030	3.43567	0.01801	6.20643	0.23716	0.00349	0.00004	43.11373662	1.00134548	1.030E-17
09M0243L	7.50 W	x	2.851728	0.02193	3.87895	0.00306	3.27612	0.00759	6.03859	0.23064	0.00307	0.00004	43.66065172	1.00134999	1.280E-17
09M0243M	8.50 W	x	2.848477	0.02322	3.15058	0.00284	3.28677	0.00851	6.00556	0.22923	0.00310	0.00004	43.81363315	1.00135124	1.040E-17
09M0243N	8.50 W	x	2.878165	0.03245	1.61021	0.00274	3.22861	0.01431	5.98811	0.22794	0.00280	0.00006	43.96835680	1.00135250	5.315E-18
09M0243O	9.50 W	x	2.845996	0.02904	1.89786	0.00297	3.10132	0.00852	5.99195	0.22812	0.00248	0.00004	44.77476927	1.00135900	6.265E-18
09M0243P	10.50 W	x	2.845060	0.02407	2.21485	0.00274	3.12563	0.00800	5.98423	0.22997	0.00257	0.00005	45.54159245	1.00136507	7.311E-18
09M0243Q	12.00 W	x	2.869985	0.02423	2.14333	0.00374	3.04188	0.01034	6.03353	0.23266	0.00221	0.00004	45.73377321	1.00136658	7.075E-18
09M0243R	15.00 W	x	2.878571	0.02341	3.10493	0.00542	3.01110	0.00985	6.01762	0.23455	0.00207	0.00004	46.48130296	1.00137238	1.025E-17
09M0243S	20.00 W	x	2.878686	0.02431	2.89388	0.00397	3.04428	0.00791	6.06743	0.23691	0.00220	0.00005	47.28513513	1.00137851	9.553E-18
09M0244H	3.50 W		3.213332	0.08446	1.94805	0.00650	10.71799	0.05169	5.92128	0.22578	0.02700	0.00027	42.24790266	1.00133822	6.429E-18
09M0244I	4.50 W		2.899344	0.02838	1.83206	0.00103	3.61688	0.00945	6.02439	0.22877	0.00406	0.00007	42.83609599	1.00134317	6.047E-18
09M0244J	5.50 W	x	2.894906	0.02490	3.01879	0.00311	3.52947	0.00883	6.06254	0.23156	0.00379	0.00005	42.98677792	1.00134442	9.964E-18
09M0244K	6.50 W	x	2.869439	0.02585	3.36315	0.00721	3.36559	0.01342	6.07798	0.23220	0.00332	0.00005	43.14331560	1.00134572	1.110E-17
09M0244L	7.50 W	x	2.845936	0.02343	3.91219	0.00462	3.29065	0.00846	6.06631	0.23193	0.00314	0.00004	43.69060592	1.00135023	1.291E-17
09M0244M	8.50 W	x	2.858406	0.02587	2.83906	0.00312	3.26905	0.00880	6.04913	0.23169	0.00302	0.00006	43.84369231	1.00135148	9.371E-18
09M0244N	8.60 W	x	2.882921	0.02673	2.04028	0.00395	3.20103	0.01073	6.05094	0.23051	0.00271	0.00006	43.99912562	1.00135275	6.735E-18

09M0244O	9.50 W	x	2.852382	0.02662	1.84807	0.00547	3.09502	0.01365	5.96260	0.22866	0.00243	0.00005	44.80548783	1.00135925	6.100E-18
09M0244P	10.50 W	x	2.856567	0.02584	2.30134	0.00273	3.04512	0.00989	6.16493	0.23812	0.00230	0.00005	45.57283710	1.00136532	7.597E-18
09M0244Q	12.00 W	x	2.832408	0.02677	1.80893	0.00542	2.98572	0.01244	6.03874	0.23279	0.00215	0.00005	45.76577746	1.00136683	5.971E-18
09M0244R	15.00 W	x	2.846363	0.02687	1.78210	0.00529	2.95148	0.01135	6.02283	0.23395	0.00198	0.00005	46.51319232	1.00137263	5.883E-18
09M0244S	20.00 W	x	2.821032	0.02757	1.36449	0.00236	2.85086	0.00828	6.02167	0.23337	0.00173	0.00006	47.31822501	1.00137876	4.504E-18

Table DR4

Incremental Heating		36Ar(a)	37Ar(ca)	38Ar(cl)	39Ar(k)	40Ar(r)	Age $\pm 1\sigma$ (Ma)	40Ar(r) (%)	39Ar(k) (%)	K/Ca $\pm 1\sigma$	
09M0234A	0.75 W	0.001798	0.000000	0.000013	0.002226	0.035446	75.52 $\pm$ 29.31	6.25			
09M0234B	1.25 W	0.004694	0.002478	0.000210	0.090458	0.259463	13.84 $\pm$ 1.03	15.76		15.695 $\pm$ 2.657	
09M0234C	1.55 W	0.002955	0.003595	0.000476	0.212685	0.636791	14.45 $\pm$ 0.32	42.17		25.436 $\pm$ 5.169	
09M0234D	1.85 W	0.003358	0.007298	0.000858	0.585444	1.738503	14.33 $\pm$ 0.14	63.65	2.07	34.496 $\pm$ 2.490	
09M0234E	2.20 W	0.002958	0.008033	0.001583	0.940205	2.757073	14.15 $\pm$ 0.09	75.91	3.32	50.331 $\pm$ 4.761	
09M0234F	2.60 W	0.004167	0.013585	0.002254	1.714121	4.967674	13.98 $\pm$ 0.05	80.12	6.05	54.255 $\pm$ 3.591	
09M0234G	3.00 W	0.003012	0.022493	0.002599	1.860546	5.372063	13.93 $\pm$ 0.04	85.77	6.57	35.568 $\pm$ 2.061	
09M0234H	3.40 W	0.001986	0.031803	0.002172	1.583972	4.517253	13.76 $\pm$ 0.05	88.48	5.59	21.416 $\pm$ 0.903	
09M0234I	3.80 W	0.002217	0.020973	0.003355	2.259885	6.446392	13.77 $\pm$ 0.04	90.75	7.98	46.333 $\pm$ 2.438	
09M0234J	4.40 W	x	0.001903	0.028754	0.003871	2.501058	7.056544	13.62 $\pm$ 0.04	92.59	8.83	37.402 $\pm$ 1.533
09M0234K	5.00 W	x	0.001739	0.025300	0.003659	2.760565	7.803902	13.64 $\pm$ 0.06	93.79	9.75	46.918 $\pm$ 2.550
09M0234L	6.00 W	x	0.002324	0.027145	0.005665	3.969939	11.182449	13.59 $\pm$ 0.03	94.19	14.02	62.887 $\pm$ 3.639
09M0234M	7.50 W	x	0.002550	0.064441	0.006953	4.752780	13.370265	13.58 $\pm$ 0.03	94.64	16.78	31.714 $\pm$ 1.318
09M0234N	7.60 W	x	0.000593	0.005149	0.001476	0.868762	2.445980	13.59 $\pm$ 0.06	93.29	3.07	72.545 $\pm$ 10.518
09M0234O	9.50 W	x	0.001182	0.014646	0.003206	2.295886	6.475304	13.61 $\pm$ 0.04	94.86	8.11	67.407 $\pm$ 4.397
09M0234P	1.20 W	x	0.000891	0.008229	0.002477	1.785217	5.007445	13.54 $\pm$ 0.04	94.98	6.30	93.288 $\pm$ 8.784
09M0234Q	1.50 W	x	0.000293	0.001411	0.000783	0.446039	1.247163	13.49 $\pm$ 0.07	93.49	1.57	135.973 $\pm$ 56.724
$\Sigma$		0.029171	0.279259	0.040911	28.324420	80.388012					
Information on Analysis		Results	40(r)/39(k) $\pm 1\sigma$			Age $\pm 1\sigma$ (Ma)	MSWD	39Ar(k) (%,n)	K/Ca $\pm 1\sigma$		
VU78-31	Biotite	Weighted Plateau	$2.8149 \pm 0.0031$ $\pm 0.11\%$			$13.58 \pm 0.07$ $\pm 0.51\%$	0.75	68.42 8	39.499 $\pm$ 4.404		
WT3	AL					External Error $\pm 0.15$	1.00	Statistical T Ratio			
						Analytical Error $\pm 0.01$	1.0000	Error Magnification			

Project = VU78	Total Fusion Age	$2.8381 \pm 0.0028$ $\pm 0.10\%$	$13.70 \pm 0.07$ $\pm 0.51\%$	14	$1.228 \pm 0.020$
Irradiation = VU78			External Error $\pm 0.15$		
J = $0.0026850 \pm 0.0000134$			Analytical Error $\pm 0.01$		
Dra = $25.420 \pm 0.145$ Ma					

Additional Parameters		40(r)/39(k)	1σ	40(r+a)	1σ	40Ar/39Ar	1σ	37Ar/39Ar	1σ	36Ar/39Ar	1σ	37Ar (decay)	39Ar (decay)	40Ar (moles)	
09M0234D	1.85 W	2.969545	0.02964	2.73081	0.00211	4.66532	0.01192	0.01247	0.00090	0.00574	0.00010	28.58209849	1.00119845	9.013E-18	
09M0234E	2.20 W	2.932418	0.01846	3.63123	0.00385	3.86300	0.00916	0.00854	0.00081	0.00315	0.00006	29.44523345	1.00120909	1.199E-17	
09M0234F	2.60 W	2.898089	0.01060	6.19891	0.00373	3.61722	0.00789	0.00793	0.00052	0.00243	0.00003	31.66341124	1.00123507	2.046E-17	
09M0234G	3.00 W	2.887359	0.00932	6.26199	0.00591	3.36650	0.00757	0.01209	0.00070	0.00162	0.00002	32.94967107	1.00124931	2.067E-17	
09M0234H	3.40 W	2.851851	0.01046	5.10399	0.00717	3.22309	0.00852	0.02008	0.00085	0.00126	0.00002	33.60281449	1.00125633	1.685E-17	
09M0234I	3.80 W	2.852531	0.00880	7.10137	0.00859	3.14320	0.00845	0.00928	0.00049	0.00098	0.00001	34.24775887	1.00126313	2.344E-17	
09M0234J	4.40 W	x	2.821424	0.00810	7.61902	0.00644	3.04715	0.00747	0.01150	0.00047	0.00076	0.00001	34.94723997	1.00127036	2.515E-17
09M0234K	5.00 W	x	2.826922	0.01242	8.31792	0.02127	3.01396	0.01217	0.00916	0.00050	0.00063	0.00001	35.73494559	1.00127833	2.746E-17
09M0234L	6.00 W	x	2.816781	0.00722	11.86907	0.00739	2.99058	0.00646	0.00684	0.00040	0.00059	0.00001	36.35243520	1.00128446	3.918E-17
09M0234M	7.50 W	x	2.813146	0.00669	14.12390	0.00416	2.97255	0.00616	0.01356	0.00056	0.00054	0.00001	37.16977427	1.00129241	4.662E-17
09M0234N	7.60 W	x	2.815476	0.01144	2.62117	0.00443	3.01798	0.00945	0.00593	0.00086	0.00068	0.00002	38.27648969	1.00130291	8.652E-18
09M0234O	9.50 W	x	2.820395	0.00913	6.82450	0.01179	2.97334	0.00897	0.00638	0.00042	0.00052	0.00001	39.12367027	1.00131074	2.253E-17
09M0234P	1.20 W	x	2.804950	0.00781	5.27066	0.00562	2.95324	0.00694	0.00461	0.00043	0.00050	0.00001	40.14678764	1.00131997	1.740E-17
09M0234Q	1.50 W	x	2.796084	0.01511	1.33364	0.00259	2.99082	0.00973	0.00316	0.00132	0.00066	0.00004	41.03086116	1.00132776	4.402E-18

Table DR5

Incremental Heating		36Ar(a)	37Ar(ca)	38Ar(cl)	39Ar(k)	40Ar(r)	Age $\pm 1\sigma$ (Ma)	40Ar(r) (%)	39Ar(k) (%)	K/Ca $\pm 1\sigma$			
09M0236A	0.75 W	0.001350	0.000614	0.000000	0.006542	0.012563	9.28 $\pm$ 9.47	3.05		4.583 $\pm$ 3.196			
09M0236B	1.25 W	0.003819	0.001199	0.000271	0.096515	0.291016	14.55 $\pm$ 1.06	20.50		34.603 $\pm$ 13.043			
09M0236C	1.55 W	0.003000	0.004003	0.000508	0.254943	0.767183	14.52 $\pm$ 0.23	46.38		27.387 $\pm$ 3.775			
09M0236D	1.85 W	0.002105	0.005061	0.000648	0.359351	1.086645	14.59 $\pm$ 0.15	63.58	1.13	30.532 $\pm$ 3.534			
09M0236E	2.20 W	0.004119	0.010445	0.001911	1.179291	3.487349	14.27 $\pm$ 0.07	74.11	3.72	48.549 $\pm$ 3.868			
09M0236F	2.60 W	0.004903	0.014273	0.002641	1.797796	5.260803	14.12 $\pm$ 0.06	78.39	5.67	54.163 $\pm$ 3.246			
09M0236G	3.00 W	0.004354	0.019469	0.004456	2.932929	8.412015	13.84 $\pm$ 0.05	86.71	9.25	64.778 $\pm$ 2.994			
09M0236H	3.40 W	0.002427	0.012340	0.003380	2.198590	6.279305	13.78 $\pm$ 0.05	89.73	6.93	76.615 $\pm$ 4.548			
09M0236I	3.80 W	0.001516	0.009273	0.002409	1.752578	5.010568	13.80 $\pm$ 0.04	91.77	5.53	81.268 $\pm$ 5.293			
09M0236J	4.40 W	x	0.002053	0.012901	0.004601	3.264234	9.219950	13.63 $\pm$ 0.04	93.80	10.29	108.801 $\pm$ 6.635		
09M0236K	5.00 W	x	0.001610	0.022084	0.003877	2.645860	7.498435	13.68 $\pm$ 0.04	94.01	8.34	51.517 $\pm$ 2.907		
09M0236L	6.00 W	x	0.002065	0.014214	0.005096	3.577660	10.074612	13.59 $\pm$ 0.03	94.26	11.28	108.231 $\pm$ 6.138		
09M0236M	7.50 W	x	0.002687	0.051647	0.007178	4.736289	13.334616	13.59 $\pm$ 0.03	94.35	14.94	39.433 $\pm$ 1.674		
09M0236N	7.60 W	x	0.001659	0.020844	0.004346	3.008801	8.505854	13.64 $\pm$ 0.04	94.52	9.49	62.071 $\pm$ 3.723		
09M0236O	9.50 W	x	0.001641	0.016150	0.005561	3.690470	10.395393	13.59 $\pm$ 0.07	95.51	11.64	98.262 $\pm$ 5.641		
09M0236P	12.00 W	x	0.000288	0.003714	0.000700	0.565088	1.592797	13.60 $\pm$ 0.06	94.90	1.78	65.420 $\pm$ 10.273		
$\Sigma$		0.031426	0.212413	0.046805	31.708937	90.158343							
Information on Analysis		Results	40(r)/39(k) $\pm 1\sigma$		Age $\pm 1\sigma$ (Ma)	MSWD	39Ar(k) (%,n)	K/Ca $\pm 1\sigma$					
VU78-31 Biotite		Weighted Plateau	$2.8212 \pm 0.0033$ $\pm 0.12\%$		$13.61 \pm 0.07$ $\pm 0.51\%$	0.70	67.77 7	52.865 $\pm$ 8.699					
WT3					External Error $\pm 0.15$	1.01	Statistical T Ratio						
AL					Analytical Error $\pm 0.02$	1.0000	Error Magnification						
Project = VU78		Total Fusion Age	$2.8433 \pm 0.0030$		$13.72 \pm 0.07$	13	1.808 $\pm$ 0.032						

Irradiation = VU78	Total Dose (Ar40)	$2.0400 \pm 0.11\%$	Total Decay (Ar39)	$13.74 \pm 0.51\%$	External Error	$\pm 0.15$	Analytical Error	$\pm 0.01$
J = $0.0026850 \pm 0.0000134$								
Dra = $25.420 \pm 0.145$ Ma								

Additional Parameters		40(r)/39(k)	1σ	40(r+a)	1σ	40Ar/39Ar	1σ	37Ar/39Ar	1σ	36Ar/39Ar	1σ	37Ar (decay)	39Ar (decay)	40Ar (moles)	
09M0236D	1.85 W	3.023907	0.03160	1.70879	0.00239	4.75603	0.01358	0.01408	0.00163	0.00586	0.00010	28.62172309	1.00119894	5.640E-18	
09M0236E	2.20 W	2.957158	0.01534	4.70455	0.00421	3.99014	0.01007	0.00886	0.00071	0.00350	0.00005	29.48605466	1.00120958	1.553E-17	
09M0236F	2.60 W	2.926252	0.01194	6.70967	0.00470	3.73300	0.00934	0.00794	0.00048	0.00273	0.00003	31.70687269	1.00123556	2.215E-17	
09M0236G	3.00 W	2.868127	0.01136	9.69850	0.01398	3.30761	0.00954	0.00664	0.00031	0.00149	0.00003	32.99535063	1.00124980	3.201E-17	
09M0236H	3.40 W	2.856060	0.01016	6.99641	0.00909	3.18307	0.00887	0.00561	0.00033	0.00111	0.00002	33.64893798	1.00125682	2.309E-17	
09M0236I	3.80 W	2.858971	0.00828	5.45867	0.00542	3.11550	0.00712	0.00529	0.00034	0.00087	0.00002	34.29523803	1.00126362	1.802E-17	
09M0236J	4.40 W	x	2.824537	0.00871	9.82648	0.01379	3.01120	0.00799	0.00395	0.00024	0.00063	0.00001	34.99520883	1.00127085	3.244E-17
09M0236K	5.00 W	x	2.834026	0.00871	7.97418	0.01118	3.01467	0.00831	0.00835	0.00047	0.00061	0.00001	35.78448650	1.00127883	2.632E-17
09M0236L	6.00 W	x	2.815978	0.00721	10.68485	0.00663	2.98740	0.00669	0.00397	0.00023	0.00058	0.00001	36.40283216	1.00128496	3.527E-17
09M0236M	7.50 W	x	2.815415	0.00634	14.12848	0.00477	2.98387	0.00616	0.01090	0.00046	0.00057	0.00001	37.22079380	1.00129290	4.664E-17
09M0236N	7.60 W	x	2.826991	0.00904	8.99595	0.01542	2.99072	0.00902	0.00693	0.00042	0.00055	0.00001	38.32902830	1.00130340	2.970E-17
09M0236O	9.50 W	x	2.816821	0.01354	10.88039	0.03667	2.94909	0.01361	0.00438	0.00025	0.00045	0.00001	39.17737172	1.00131123	3.592E-17
09M0236P	12.00 W	x	2.818672	0.01309	1.67792	0.00180	2.97015	0.00709	0.00657	0.00103	0.00051	0.00004	40.20189343	1.00132046	5.539E-18

**Table DR6**

Incremental Heating		36Ar(a)	37Ar(ca)	38Ar(cl)	39Ar(k)	40Ar(r)	Age $\pm 1\sigma$ (Ma)	40Ar(r) (%)	39Ar(k) (%)	K/Ca $\pm 1\sigma$	
09M0234D	1.85 W	0.003358	0.007298	0.000858	0.585444	1.738503	14.33 $\pm$ 0.14	63.65	0.98	34.496 $\pm$ 2.490	
09M0234E	2.20 W	0.002958	0.008033	0.001583	0.940205	2.757073	14.15 $\pm$ 0.09	75.91	1.57	50.331 $\pm$ 4.761	
09M0234F	2.60 W	0.004167	0.013585	0.002254	1.714121	4.967674	13.98 $\pm$ 0.05	80.12	2.86	54.255 $\pm$ 3.591	
09M0234G	3.00 W	0.003012	0.022493	0.002599	1.860546	5.372063	13.93 $\pm$ 0.04	85.77	3.10	35.568 $\pm$ 2.061	
09M0234H	3.40 W	0.001986	0.031803	0.002172	1.583972	4.517253	13.76 $\pm$ 0.05	88.48	2.64	21.416 $\pm$ 0.903	
09M0234I	3.80 W	0.002217	0.020973	0.003355	2.259885	6.446392	13.77 $\pm$ 0.04	90.75	3.76	46.333 $\pm$ 2.438	
09M0234J	4.40 W	x	0.001903	0.028754	0.003871	2.501058	7.056544	13.62 $\pm$ 0.04	92.59	4.17	37.402 $\pm$ 1.533
09M0234K	5.00 W	x	0.001739	0.025300	0.003659	2.760565	7.803902	13.64 $\pm$ 0.06	93.79	4.60	46.918 $\pm$ 2.550
09M0234L	6.00 W	x	0.002324	0.027145	0.005665	3.969939	11.182449	13.59 $\pm$ 0.03	94.19	6.61	62.887 $\pm$ 3.639
09M0234M	7.50 W	x	0.002550	0.064441	0.006953	4.752780	13.370265	13.58 $\pm$ 0.03	94.64	7.92	31.714 $\pm$ 1.318
09M0234N	7.60 W	x	0.000593	0.005149	0.001476	0.868762	2.445980	13.59 $\pm$ 0.06	93.29	1.45	72.545 $\pm$ 10.518
09M0234O	9.50 W	x	0.001182	0.014646	0.003206	2.295886	6.475304	13.61 $\pm$ 0.04	94.86	3.82	67.407 $\pm$ 4.397
09M0234P	1.20 W	x	0.000891	0.008229	0.002477	1.785217	5.007445	13.54 $\pm$ 0.04	94.98	2.97	93.288 $\pm$ 8.784
09M0234Q	1.50 W	x	0.000293	0.001411	0.000783	0.446039	1.247163	13.49 $\pm$ 0.07	93.49	0.74	135.973 $\pm$ 56.724
09M0236D	1.85 W		0.002105	0.005061	0.000648	0.359351	1.086645	14.59 $\pm$ 0.15	63.58	0.60	30.532 $\pm$ 3.534
09M0236E	2.20 W		0.004119	0.010445	0.001911	1.179291	3.487349	14.27 $\pm$ 0.07	74.11	1.96	48.549 $\pm$ 3.868
09M0236F	2.60 W		0.004903	0.014273	0.002641	1.797796	5.260803	14.12 $\pm$ 0.06	78.39	2.99	54.163 $\pm$ 3.246
09M0236G	3.00 W		0.004354	0.019469	0.004456	2.932929	8.412015	13.84 $\pm$ 0.05	86.71	4.89	64.778 $\pm$ 2.994
09M0236H	3.40 W		0.002427	0.012340	0.003380	2.198590	6.279305	13.78 $\pm$ 0.05	89.73	3.66	76.615 $\pm$ 4.548
09M0236I	3.80 W		0.001516	0.009273	0.002409	1.752578	5.010568	13.80 $\pm$ 0.04	91.77	2.92	81.268 $\pm$ 5.293
09M0236J	4.40 W	x	0.002053	0.012901	0.004601	3.264234	9.219950	13.63 $\pm$ 0.04	93.80	5.44	108.801 $\pm$ 6.635
09M0236K	5.00 W	x	0.001610	0.022084	0.003877	2.645860	7.498435	13.68 $\pm$ 0.04	94.01	4.41	51.517 $\pm$ 2.907
09M0236L	6.00 W	x	0.002065	0.014214	0.005096	3.577660	10.074612	13.59 $\pm$ 0.03	94.26	5.96	108.231 $\pm$ 6.138
09M0236M	7.50 W	x	0.002687	0.051647	0.007178	4.736289	13.334616	13.59 $\pm$ 0.03	94.35	7.89	39.433 $\pm$ 1.674
09M0236N	7.60 W	x	0.001659	0.020844	0.004346	3.008801	8.505854	13.64 $\pm$ 0.04	94.52	5.01	62.071 $\pm$ 3.723
09M0236O	9.50 W	x	0.001641	0.016150	0.005561	3.690470	10.395393	13.59 $\pm$ 0.07	95.51	6.15	98.262 $\pm$ 5.641
09M0236P	12.00 W	x	0.000288	0.003714	0.000700	0.565088	1.592797	13.60 $\pm$ 0.06	94.90	0.94	65.420 $\pm$ 10.273
$\Sigma$		0.060598	0.491672	0.087715	60.033357	170.546355					

Information on Analysis	Results	40(r)/39(k) $\pm 1\sigma$	Age $\pm 1\sigma$ (Ma)	MSV	39Ar(k) (%n)	K/Ca $\pm 1\sigma$
VU78-31 Biotite WT3 AL	Weighted Plateau	2.8179 $\pm 0.0022$ $\pm 0.08\%$	13.60 $\pm 0.07$ $\pm 0.50\%$	0.82	68.08 15	43.886 $\pm 4.469$
			External Error $\pm 0.15$	0.97	Statistical T Ratio	
			Analytical Error $\pm 0.01$	1.0000	Error Magnification	
Project = VU78 Irradiation = VU78 J = 0.0026850 $\pm 0.0000134$ Dra = 25.420 $\pm 0.145$ Ma	Total Fusion Age	2.8409 $\pm 0.0020$ $\pm 0.07\%$	13.71 $\pm 0.07$ $\pm 0.50\%$	27	1.479 $\pm 0.018$	
			External Error $\pm 0.15$			
			Analytical Error $\pm 0.01$			

Additional Parameters		40(r)/39(k)	1 $\sigma$	40(r+a)	1 $\sigma$	40Ar/39Ar	1 $\sigma$	37Ar/39Ar	1 $\sigma$	36Ar/39Ar	1 $\sigma$	37Ar (decay)	39Ar (decay)	40Ar (moles)	
09M0234D	1.85 W	2.969545	0.02964	2.73081	0.00211	4.66532	0.01192	0.01247	0.00090	0.00574	0.00010	28.58209849	1.00119845	9.013E-18	
09M0234E	2.20 W	2.932418	0.01846	3.63123	0.00385	3.86300	0.00916	0.00854	0.00081	0.00315	0.00006	29.44523345	1.00120909	1.199E-17	
09M0234F	2.60 W	2.898089	0.01060	6.19891	0.00373	3.61722	0.00789	0.00793	0.00052	0.00243	0.00003	31.66341124	1.00123507	2.046E-17	
09M0234G	3.00 W	2.887359	0.00932	6.26199	0.00591	3.36650	0.00757	0.01209	0.00070	0.00162	0.00002	32.94967107	1.00124931	2.067E-17	
09M0234H	3.40 W	2.851851	0.01046	5.10399	0.00717	3.22309	0.00852	0.02008	0.00085	0.00126	0.00002	33.60281449	1.00125633	1.685E-17	
09M0234I	3.80 W	2.852531	0.00880	7.10137	0.00859	3.14320	0.00845	0.00928	0.00049	0.00098	0.00001	34.24775887	1.00126313	2.344E-17	
09M0234J	4.40 W	x	2.821424	0.00810	7.61902	0.00644	3.04715	0.00747	0.01150	0.00047	0.00076	0.00001	34.94723997	1.00127036	2.515E-17
09M0234K	5.00 W	x	2.826922	0.01242	8.31792	0.02127	3.01396	0.01217	0.00916	0.00050	0.00063	0.00001	35.73494559	1.00127833	2.746E-17
09M0234L	6.00 W	x	2.816781	0.00722	11.86907	0.00739	2.99058	0.00646	0.00684	0.00040	0.00059	0.00001	36.35243520	1.00128446	3.918E-17
09M0234M	7.50 W	x	2.813146	0.00669	14.12390	0.00416	2.97255	0.00616	0.01356	0.00056	0.00054	0.00001	37.16977427	1.00129241	4.662E-17
09M0234N	7.60 W	x	2.815476	0.01144	2.62117	0.00443	3.01798	0.00945	0.00593	0.00086	0.00068	0.00002	38.27648969	1.00130291	8.652E-18
09M0234O	9.50 W	x	2.820395	0.00913	6.82450	0.01179	2.97334	0.00897	0.00638	0.00042	0.00052	0.00001	39.12367027	1.00131074	2.253E-17
09M0234P	1.20 W	x	2.804950	0.00781	5.27066	0.00562	2.95324	0.00694	0.00461	0.00043	0.00050	0.00001	40.14678764	1.00131997	1.740E-17
09M0234Q	1.50 W	x	2.796084	0.01511	1.33364	0.00259	2.99082	0.00973	0.00316	0.00132	0.00066	0.00004	41.03086116	1.00132776	4.402E-18
09M0236D	1.85 W		3.023907	0.03160	1.70879	0.00239	4.75603	0.01358	0.01408	0.00163	0.00586	0.00010	28.62172309	1.00119894	5.640E-18

09M0236E	2.20 W	2.957158	0.01534	4.70455	0.00421	3.99014	0.01007	0.00886	0.00071	0.00350	0.00005	29.48605466	1.00120958	1.553E-17	
09M0236F	2.60 W	2.926252	0.01194	6.70967	0.00470	3.73300	0.00934	0.00794	0.00048	0.00273	0.00003	31.70687269	1.00123556	2.215E-17	
09M0236G	3.00 W	2.868127	0.01136	9.69850	0.01398	3.30761	0.00954	0.00664	0.00031	0.00149	0.00003	32.99535063	1.00124980	3.201E-17	
09M0236H	3.40 W	2.856060	0.01016	6.99641	0.00909	3.18307	0.00887	0.00561	0.00033	0.00111	0.00002	33.64893798	1.00125682	2.309E-17	
09M0236I	3.80 W	2.858971	0.00828	5.45867	0.00542	3.11550	0.00712	0.00529	0.00034	0.00087	0.00002	34.29523803	1.00126362	1.802E-17	
09M0236J	4.40 W	x	2.824537	0.00871	9.82648	0.01379	3.01120	0.00799	0.00395	0.00024	0.00063	0.00001	34.99520883	1.00127085	3.244E-17
09M0236K	5.00 W	x	2.834026	0.00871	7.97418	0.01118	3.01467	0.00831	0.00835	0.00047	0.00061	0.00001	35.78448650	1.00127883	2.632E-17
09M0236L	6.00 W	x	2.815978	0.00721	10.68485	0.00663	2.98740	0.00669	0.00397	0.00023	0.00058	0.00001	36.40283216	1.00128496	3.527E-17
09M0236M	7.50 W	x	2.815415	0.00634	14.12848	0.00477	2.98387	0.00616	0.01090	0.00046	0.00057	0.00001	37.22079380	1.00129290	4.664E-17
09M0236N	7.60 W	x	2.826991	0.00904	8.99595	0.01542	2.99072	0.00902	0.00693	0.00042	0.00055	0.00001	38.32902830	1.00130340	2.970E-17
09M0236O	9.50 W	x	2.816821	0.01354	10.88039	0.03667	2.94909	0.01361	0.00438	0.00025	0.00045	0.00001	39.17737172	1.00131123	3.592E-17
09M0236P	12.00 W	x	2.818672	0.01309	1.67792	0.00180	2.97015	0.00709	0.00657	0.00103	0.00051	0.00004	40.20189343	1.00132046	5.539E-18